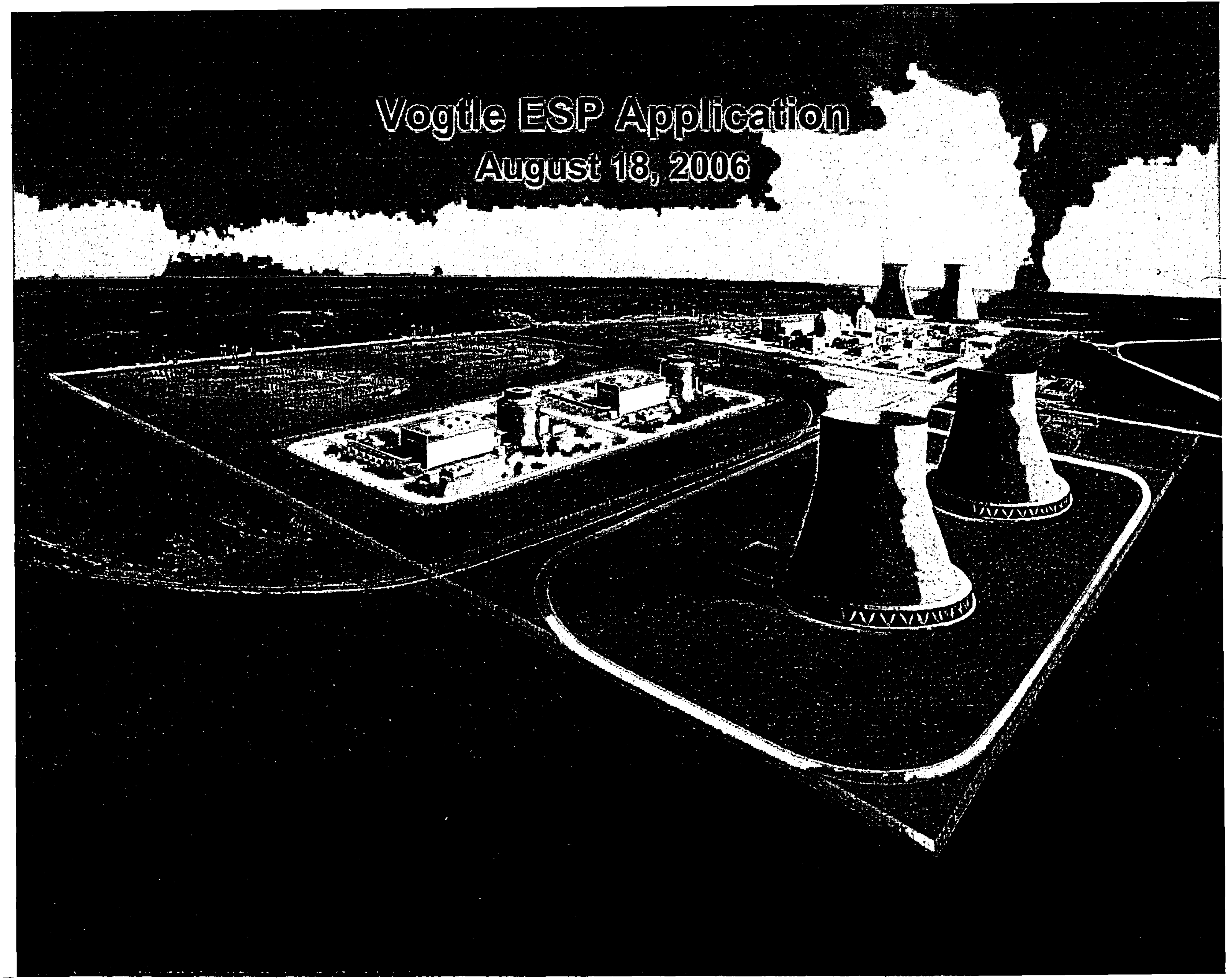
Vogtle ESP Application
August 18, 2006

SOUTHERN COMPANY

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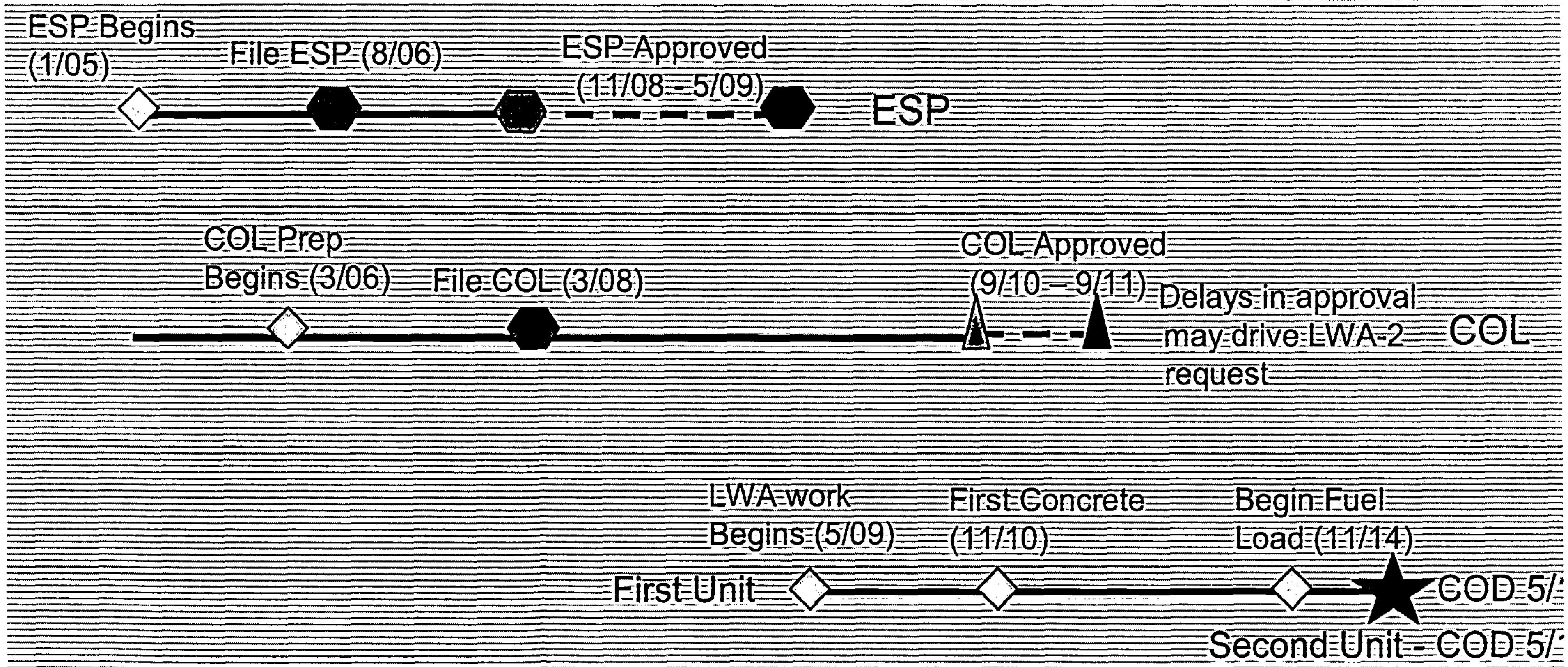
Vogtle 3 & 4 Schedule



➤ **No decision has been made to construct**

Vogtle Program

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- NuStart
- Standardization
- Commitment to quality and schedule

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VEGP ESP Level of Detail

Example	Other ESPs	VEGP ESP
Reactor Type Power Output	PPE	Two AP1000's at 1117 MWe Each
Plant Layout Cooling Water Design Intake Design	General Information Provided	Detailed Design and Layouts Provided
Water Consumption And Discharge Flow	Envelope Approach	Plant-Specific Numbers Provided
Normal Effluents and Accident Doses	Envelope Approach	Plant-Specific Numbers Provided
Emergency Plan	Major Features	Complete & Integrated Plan

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Vogtle Nuclear Development Management Team

Senior Vice President
Buzz Miller

QA Project Engineer
John Giddens

Technology & Startup Director
Richard Hill

Vogtle Deployment Director
Dale Lloyd

Business Services Manager
David Varner

Engineering
Doug McComb

Vogtle Licensing Manager
Chuck Pierce

COL Project Engineer
Tom McCallum

ESP Project Engineer
Jim Davis

ESP Overview

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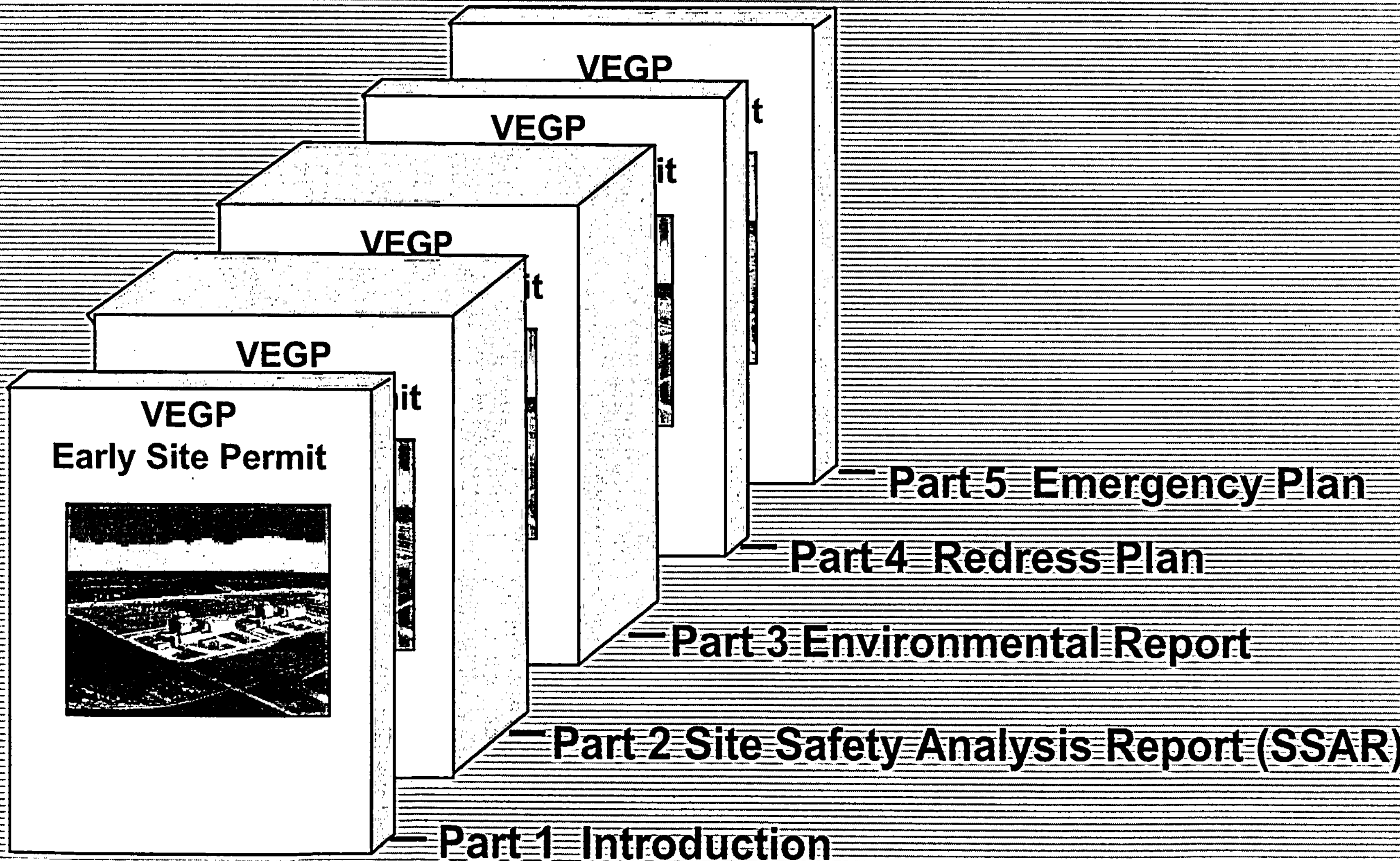

Table of Contents

Part 1 ADMINISTRATIVE INFORMATION

Chapter 1 Introduction

1.1 Introduction

Southern Nuclear Operating Company (Southern Nuclear or SNC), acting on behalf of itself and the owners of the Vogtle Electric Generating Plant (VEGP) site, identified below, hereby submits this application for an Early Site Permit (ESP) for two additional reactors at the VEGP site near Waynesboro, Georgia. This application is submitted in accordance with Title 10 of the Code of Federal Regulations, Part 52 (10 CFR 52), Subpart A – Early Site Permits. SNC requests that the NRC issue an ESP for the VEGP site described in this application for a period of 20 years from the date of issuance. The information presented in this application supports issuance of this permit.

The 3,169-acre VEGP site is located on a coastal plain bluff on the southwest side of the Savannah River in eastern Burke County Georgia. The site is approximately 30 river miles above the U.S. 301 bridge and directly across the river from the Department of Energy's Savannah River Site (Barnwell County, South Carolina). The VEGP site is owned by Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia, an incorporated municipality in the State of Georgia acting by and through its Board of Water, Light and Sinking Fund Commissioners ('Dalton Utilities'). These VEGP site owners are herein referred to as the owners.

ESP application, Part 2, Chapter 1 provides a more detailed description of the VEGP site.

Locating proposed additional nuclear units on an existing nuclear plant site will be beneficial because this existing site already has an infrastructure in-place to support nuclear power generation. Other key advantages of locating additional nuclear units at the VEGP site are as follows:

- Existing VEGP Units 1 and 2 site related analysis and operating records were available as inputs for development of various sections of this ESP application.
- The VEGP site and its exclusion area previously underwent a screening and evaluation process establishing its suitability, including a National Environmental Policy Act (NEPA) evaluation of alternatives. The proposed additional nuclear units are located within the existing VEGP site exclusion area boundary (site property boundary).

- Programs, procedures, and arrangements have been established, and are in-place, with State and local government agencies, covering emergency planning, discharge permits, etc.
- Liaisons with the local community are already established.

SNC is the licensed operator of the existing generating facilities at the VEGP site, with control of the existing facilities, including complete authority to regulate any and all access and activity within the plant exclusion area boundary, and authority to act as the agent of the site owners. SNC has been authorized by GPC, acting as agent for the other owners (also known as co-owners) of the existing VEGP, to apply for an ESP for the VEGP site.

Chapter 3 General Information – 10 CFR 50.33

3.1 Names of Applicant and Owners

SNC, as authorized by Georgia Power Company, submits this application individually, and for the owner licensees to be named on the ESP. The names of the applicant and owner licensees are as follows:

- Georgia Power Company
- Oglethorpe Power Corporation (An Electric Membership Corporation)
- Municipal Electric Authority of Georgia
- The City of Dalton, Georgia, an incorporated municipality in the State of Georgia acting by and through its Board of Water, Light and Sinking Fund Commissioners ('Dalton Utilities')
- Southern Nuclear Operating Company, Inc. (non-owner applicant)

Part 2 SITE SAFETY ANALYSIS REPORT

Chapter 1 Introduction and General Description

1.1 Introduction

This Site Safety Analysis Report (SSAR) supports Southern Nuclear Operating Company's (SNC's or Southern Nuclear's) Early Site Permit (ESP) application. The SSAR addresses site suitability issues and complies with the applicable portions of Title 10, Part 52 of the Code of Federal Regulations (10 CFR 52), Subpart A, *Early Site Permits*.

The site selected for the ESP is the Vogtle Electric Generating Plant (VEGP) site in eastern Burke County, Georgia; approximately 26 miles southeast of Augusta, Georgia and 100 miles northwest of Savannah, Georgia; directly across the Savannah River from the US Department of Energy's Savannah River Site in Barnwell County, South Carolina. VEGP Units 1 and 2, two Westinghouse Electric Company, LLC (Westinghouse) pressurized water reactors (PWRs), each with a thermal power rating of 3565 megawatts thermal (MWt), are located on the VEGP site. VEGP Units 1 and 2 have been in commercial operation since 1987 and 1989, respectively. Plant Wilson, a six-unit oil-fueled combustion turbine facility owned by Georgia Power Company (GPC), is also located on the VEGP site.

SNC has selected the Westinghouse AP1000 certified reactor design for the VEGP ESP application. The AP1000 has a thermal power rating of 3,400 MWt, with a net electrical output of 1,117 megawatts electrical (MWe) **(Westinghouse 2005)**. Two units are proposed, with projected commercial operation dates of May 2015 and May 2016, respectively.

The ESP units, VEGP Units 3 and 4, are adjacent to and west of the existing VEGP units.

The existing VEGP units are co-owned by Georgia Power Company, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the City of Dalton, Georgia, an incorporated municipality in the State of Georgia acting by and through its Board of Water, Light and Sinking Fund Commissioners ("Dalton Utilities"). SNC is the licensed operator of the existing facilities at the VEGP site, with control of the existing facilities, including complete authority to regulate any and all access and activity within the plant exclusion area boundary. SNC has been authorized by GPC, acting as agent for the other owners (also known as co-owners) of the existing VEGP, to apply for an ESP for the VEGP site. SNC has no ownership interest in the VEGP.

GPC and SNC are subsidiaries of Southern Company, and SNC is the licensed operator for all Southern Company nuclear generating facilities. SNC's business purpose is management and operation of nuclear generating facilities owned or co-owned by Southern Company

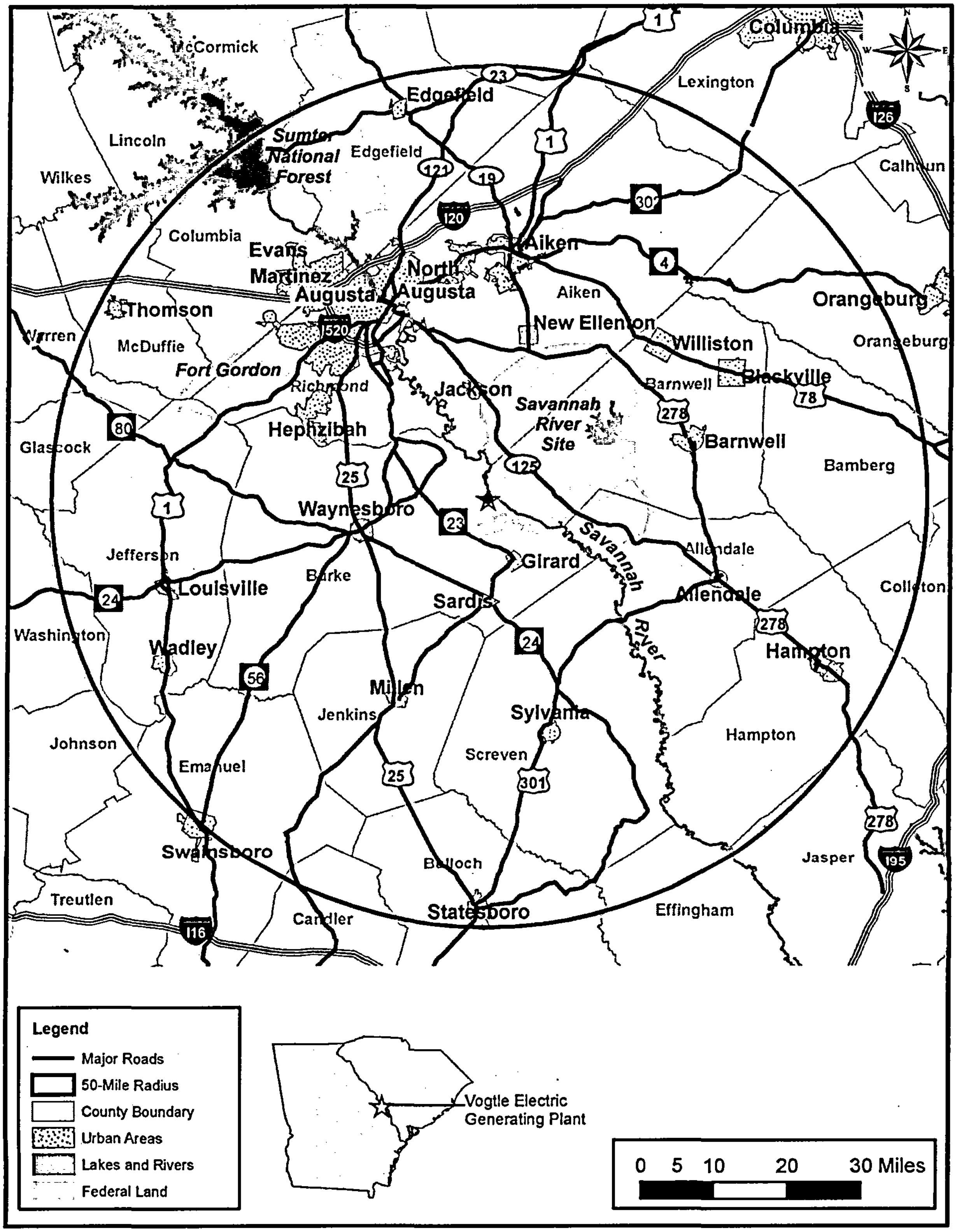

Figure 1-2 50-Mile Vicinity

subsidiaries. SNC ESP Application Part 1, *Administrative Information*, Chapter 3, provides additional information about Southern Company, GPC, VEGP co-owners, and SNC.

The SSAR discusses the design parameters, site characteristics, and site interface values for the two units that would form the basis for NRC's issuance of an ESP. The SSAR also contains information about site safety, emergency preparedness, and quality assurance. The following paragraphs briefly describe the contents of the SSAR:

- Chapter 1, Introduction and General Description, includes a general site description; an overview of the AP1000; the design parameter, site characteristic, and site interface value approach; and a summary of regulatory compliance (CFR, Regulatory Guides, and NUREG-0800/RS-002).
- Chapter 2, Site Characteristics, includes geography and demography; nearby industrial installations; transportation and military facilities; and meteorologic, hydrologic, geologic, and seismic characteristics of the site. It also includes descriptions of effluents; thermal discharges; and conformance with 10 CFR 100, *Reactor Site Criteria*, requirements.
- Chapter 3, Design of Structures, Components, Equipment, and Systems, contains information in Section 3.5.1.6 on aircraft hazards.
- Chapter 13, Conduct of Operations, includes emergency planning and industrial security information.
- Chapter 15, Accident Analyses, includes accident and dose consequence analyses required by 10 CFR 52.17(a)(1), 10 CFR 50.34(a)(1), and 10 CFR 100.21(c)(2).
- Chapter 17, Quality Assurance, includes the Quality Assurance Program (QAP) under which the ESP application has been prepared. The QAP also addresses ESP activities prior to Combined Operating License (COL) receipt, such as site preparation, earthwork, preconstruction activities, and procurement.

1.2 General Site Description

1.2.1 Site Location

The 3,169-acre VEGP site is located on a coastal plain bluff on the southwest side of the Savannah River in eastern Burke County. The site exclusion area boundary (EAB) is bounded by River Road, Hancock Landing Road and 1.7 miles of the Savannah River (River Miles 150.0 to 151.7). The property boundary entirely encompasses the EAB and extends beyond River Road in some areas. The site is approximately 30 river miles above the U.S. 301 bridge and directly across the river from the Department of Energy's Savannah River Site (Barnwell County, South Carolina). The VEGP site is approximately 15 miles east-northeast of Waynesboro, Georgia and 26 miles southeast of Augusta, Georgia, the nearest population center (i.e., having more than 25,000 residents). It is also about 100 miles from Savannah, uses fuel, a reactor vessel, and internals similar to those in service today at South Texas Project. The reactor coolant pumps are canned pumps to reduce the probability of leakage and to improve reliability.

The AP1000 is designed to use passive features for accident mitigation. An externally cooled steel containment building, in-containment refueling water storage tank, rapid depressurizing capability, and other design features preclude the need for safety-related electrical alternating-current-powered equipment used by the current nuclear fleet. Electrical power generation is through the use of a standard steam turbine cycle.

The AP1000 is designed in a single-unit, stand-alone configuration.

1.3.3 Use of the Site Characteristics, Design Parameters, and Site Interface Values Table

The *Site Characteristics, Design Parameters, and Site Interface Values* table (Table 1-1) provides a summary list of the limiting site characteristic values that have been established by analyses presented throughout the SSAR. This list also provides a summary of important site characteristics necessary to establish the findings required by 10 CFR Parts 52 and 100 on the suitability of the proposed ESP site. This list is intended to support development of the *Site Characteristics and Plant Design Parameters for the Early Site Permit* table, as defined by the NRC **(NRC-NEI 2004)**. Table 1-1 further provides a list of limiting design parameters and assumptions involving the design of a nuclear power plant that may be constructed on the ESP site in the future, in order to assess site characteristics.

Table 1-1 is divided into three parts. Part I, Site Characteristics, includes the data that is specific to the ESP site. Part II, Design Parameters, includes information supplied by the reactor vendor, Westinghouse, for the AP1000 plant design. Part III, Site Interface Values, includes the values that have been determined based on the interrelationship of certain site characteristics and design parameters. The table includes a summary description of each item and a reference to the SSAR section(s) in which more detailed information can be found. Where two-unit values are different from one-unit values, the two-unit value is included in brackets [ ].

Since certain support system designs, such as cooling towers, have not yet been completed, the data in this table are based on design requirements and interface information from the reactor vendor, Westinghouse.

1.4 Identification of Agents and Contractors

SNC has selected Bechtel Power Corporation (Bechtel) as its principal contractor to assist with preparing the SSAR portion of the ESP application and Tetra Tech NUS, Inc. (TtNUS), to assist with preparing the Environmental Report portion. Bechtel and TtNUS have supplied personnel, systems, project management, and resources to work on an integrated team with SNC.

1.4.1 Bechtel Corporation

Bechtel is the nation's largest power contractor and is headquartered in San Francisco. Bechtel has a history of supporting the nuclear power industry, beginning with the construction in 1950 of the EBR-1 reactor. Since then, Bechtel has engineered and constructed more than 60,000 MWe of nuclear power capacity worldwide. Bechtel currently has approximately 40,000 employees working on 400 projects in 47 different countries around the globe.

1.4.2 Tetra Tech NUS, Inc.

TtNUS is an environmental and engineering consulting company with a history of service to the nuclear power industry since the inception of its predecessor company, Nuclear Utility Services (NUS) Corporation in 1960. TtNUS currently has 20 offices and approximately 700 employees throughout the country. TtNUS is a wholly owned subsidiary of Tetra Tech, Inc., which has approximately 9,000 employees worldwide.

1.4.3 Other Contractors

In addition to Bechtel and TtNUS, contractual relationships were established with several specialized consultants to assist in developing the ESP application.

1.4.3.1 MACTEC Engineering and Consulting, Inc.

MACTEC Engineering and Consulting, Inc., performed geotechnical field investigations and laboratory testing in support of SSAR Section 2.5, Geology, Seismology, and Geotechnical Engineering. That effort included performing standard penetration tests; obtaining core samples and rock cores; performing cone penetrometer tests, downhole geophysical logging, and laboratory tests of soil and rock samples; installing ground water observation wells; and preparing a data report.

1.4.3.2 William Lettis & Associates, Inc.

William Lettis & Associates, Inc., performed geologic mapping and characterized seismic sources in support of SSAR Section 2.5, including literature review, geologic field reconnaissance, review and evaluation of existing seismic source characterization models, identification and characterization of any new or different sources, and preparation of the related SSAR sections.

1.4.3.3 Risk Engineering, Inc.

Risk Engineering, Inc., performed probabilistic seismic hazard assessments and related sensitivity analyses in support of SSAR Section 2.5. These assignments included sensitivity analyses of seismic source parameters and updated ground motion attenuation relationships,

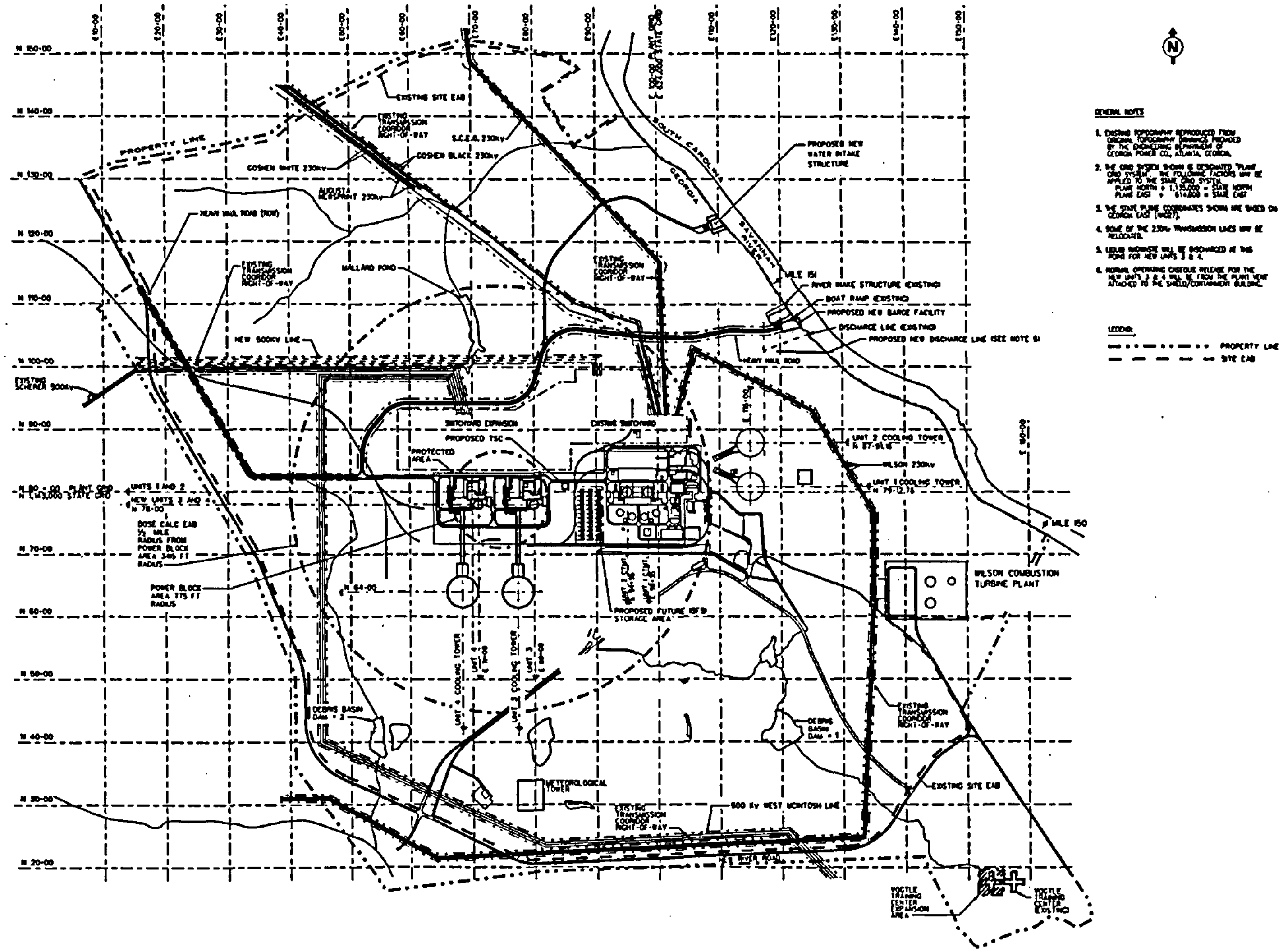

Figure 1-4 Site Layout – New Development

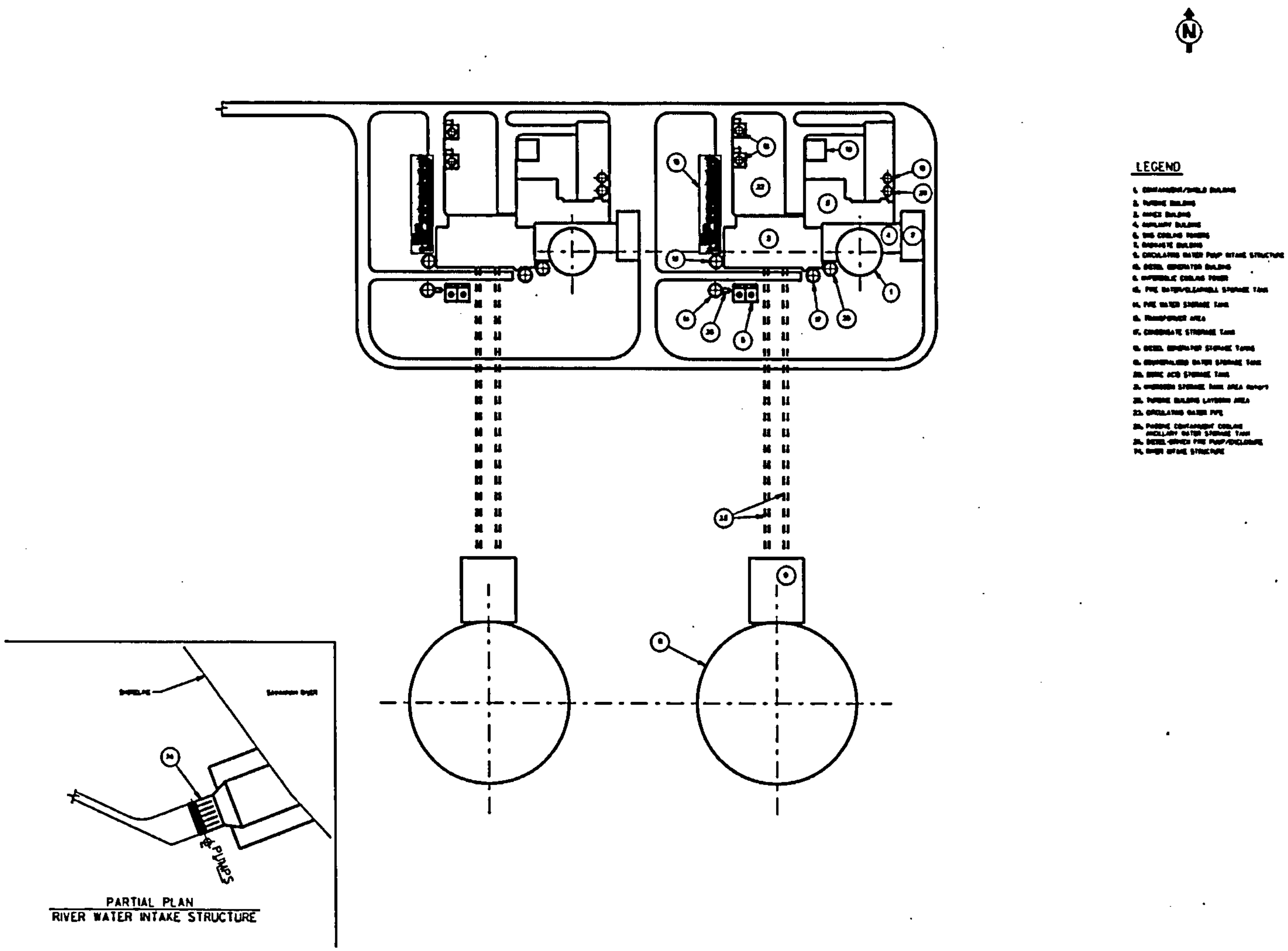

Figure 1-5 VEGP Units 3 and 4 Power Block Arrangement

Georgia and 150 river miles from the mouth of the Savannah River. Numerous small towns exist within 50 miles of the site. A major Interstate highway, I-20, crosses the northern portion of the 50-mile radius. Access to the site is via US Route 25; Georgia Routes 56, 80, 24, 23; and New River Road. A navigation channel is authorized on the Savannah River from the Port of Savannah to Augusta, Georgia. A railroad spur connects the site to the Norfolk Southern Savannah-to-Augusta track.

Figures 1-1 and 1-2 show the site location and a 6-mile and 50-mile radius, respectively.

1.2.2 Site Development

The VEGP site currently has two Westinghouse pressurized water reactors (PWRs), rated at 3,565 MWt, and their supporting structures. These structures include two natural-draft cooling towers (one per unit), associated pumping and discharge structures, water treatment building, switchyard, and training center. Plant Wilson, a six-unit oil-fueled combustion turbine facility, is also located on the VEGP site. Figure 1-3 shows the current VEGP site plan.

The new plant footprint selected for the ESP is adjacent to the west side of the VEGP Units 1 and 2, and is generally the area that was originally designated for VEGP Units 3 and 4 when the plant was first proposed for construction. The footprint is shown on Figure 1-4.

SNC has selected the Westinghouse AP1000 certified reactor design for the ESP application. SSAR Section 1.3 identifies the design parameters, site characteristics, and site interface values that form the permit basis for NRC's issuance of an ESP. The design parameters are based on the addition of two Westinghouse AP1000 units, to be designated Vogtle Units 3 and 4. Each unit represents a portion of the total generation capacity to be added and will consist of one reactor with a thermal power rating of 3,400 MWt and a net electrical output of 1,117 MWe **(Westinghouse 2005)**. The layout and arrangement of the proposed new units are shown in Figure 1-5.

1.3 Site Characteristics, Design Parameters, and Site Interface Values

The required contents of an ESP application are specified in 10 CFR 52.17. As detailed in 10 CFR 52.17(a)(1), the application is required to specify, among other things, the number, type, and thermal power level of the facilities; boundaries of the site and proposed general location of each facility; type of cooling systems, intakes, and outflows; anticipated maximum levels of radiological and thermal effluents; site seismic, meteorological, hydrologic, and geologic characteristics; and existing and projected future population profile of the area surrounding the site. The SNC approach to providing this information is presented in the following subsections.

Table 1-1 Site Characteristics, Design Parameters, and Site Interface Values

Part I Site Characteristics		
Item	**Value**	**Description and Reference**
Precipitation		
Maximum Rainfall Rate	19.2 inches in 1 hr 6.2 inches in 5 min	PMP for 1-hr and 5-min duration of precipitation at the site. Refer to Table 2.4.2-3 and Figure 2.4.2-4
100-Year Snow Pack 48-Hour Winter Probable Maximum Precipitation (PMP)	10 lb/sq ft 28.3 in.	Weight, per unit area, of the 100-year return period snowpack at the site Maximum probable winter rainfall in 48-hour period. Refer to Section 2.3.1.3.4
Seismic		
Design Response Spectra	Values specified and illustrated in Section 2.5.2	Site-specific response spectra. Refer to Section 2.5.2 and Figure 2.5.2-44.
Capable Tectonic Structures or Sources	No fault displacement potential within the investigative area	Conclusion on the presence of capable faults or earthquake sources in the vicinity of the plant site. Refer to Sections 2.5.1.1.4, 2.5.1.2.4, and 2.5.3; Table 2.5.3-1
Water		
Maximum Flood (or Tsunami)	178.10 ft msl	Water level at the site due to dam breach. Refer to Sections 2.4.2.2, 2.4.3.4, 2.4.4.3, and 2.4.10;
Maximum Groundwater	165 ft msl	Site basis for subsurface hydrostatic loading due to difference in elevation between the site grade elevation in the power block area and the maximum site groundwater level. Refer to Sections 2.4.12.4 and 2.5.4.6.1

Table 1-2 Regulatory Compliance Matrix

Legend:
X = Complies
C = Clarification Required, See Table 1-3

Regulatory Requirements Document Title	Rev.	Date	Chapter 1	2.1.1	2.1.2	2.1.3	2.2.1 - 2.2.2	2.2.3	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5	2.4.6	2.4.7	2.4.8	2.4.9	2.4.10	2.4.11	2.4.12	2.4.13	2.5.1	2.5.2	2.5.3	2.5.4	2.5.5	2.5.6	3.5.1.6	13.3	13.6	Chapter 15	Chapter 17
NRC Regulations																																					
10 CFR 20				X																														X			
10 CFR 20, Appendix B, Table 2																										X											
10 CFR 50.34(a)					X																																
10 CFR 50.34(a)(1)						X																														X	
10 CFR 50.34(a)(12)																												X									
10 CFR 50.34(b)(10)																												X									
10 CFR 50.47											X																										
10 CFR 50.47(b)(4)																																		X			
10 CFR 50.55a																					X		X								X						
10 CFR 50, Appendix A, GDC 2									X	X				X							X		X	X			X	X	X								
10 CFR 50, Appendix A, GDC 4									X																												
10 CFR 50, Appendix A, GDC 44																					X	X		X						X	X						
10 CFR 50, Appendix B																																					X
10 CFR 50, Appendix E											X	X	X																					X			
10 CFR 50, Appendix I				X							X		X																								
10 CFR 50, Appendix S IV(a)																												X									
10 CFR 50, Appendix S IV(b)																													X								
10 CFR 50, Appendix S IV(c)															X		X	X																			
10 CFR 52, Subpart A			X		X		X																			X	X	X	X	X	X	X					
10 CFR 52.17(a)														X	X			X	X	X	X	X	X	X	X												
10 CFR 52.17(a)(1)			X	X		X	X	X	X	X	X	X	X			X	X																X			X	
10 CFR 52.17(b)(1)																																		X			
10 CFR 52.17(b)(2)																																		X			
10 CFR 52.17(b)(3)																																		X			
10 CFR 52.18						X																															
10 CFR 52.24							X																														
10 CFR 73.55																																			X		
10 CFR 100																					X			X		X							X			X	
10 CFR 100.3					X	X																															
10 CFR 100, Subpart B				X		X																															
10 CFR 100.20							X					X	X																								
10 CFR 100.20 (b)								X																													
10 CFR 100.20(c)									X	X	X			X	X	X	X	X	X	X		X	X		X												
10 CFR 100.21(a)					X																																
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10 CFR 100.21(f)																																			X		

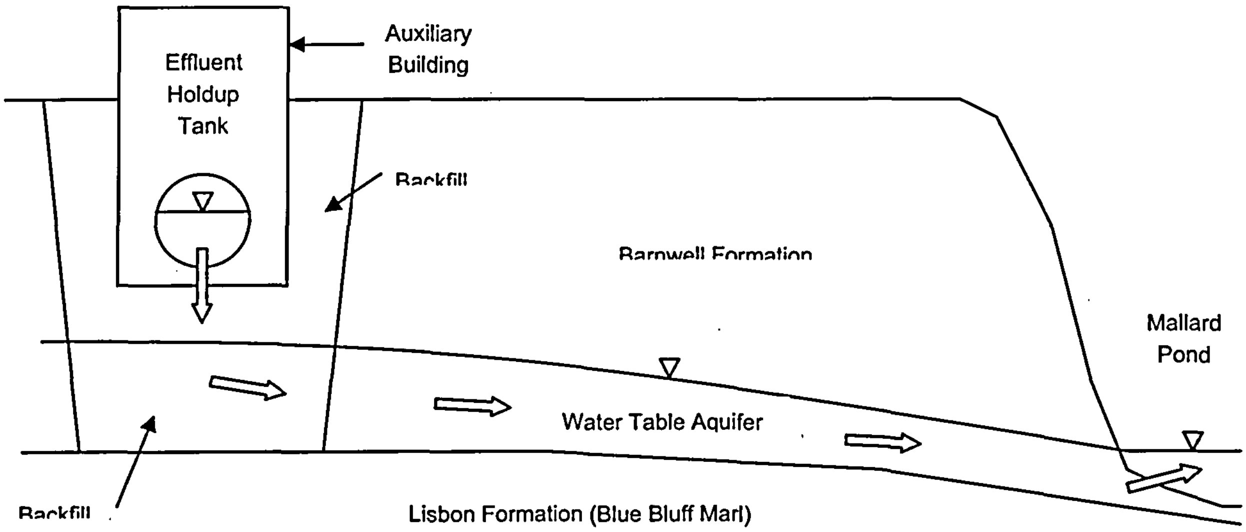

Figure 2.4.13-1 Conceptual Model for Evaluating Radionuclide Transport in Groundwater

2.0×10^{-7} µCi/cm^3 MPC value. Note that the stream exiting Mallard Pond gains additional runoff water as it flows to the Savannah River, which would result in more dilution than was accounted for in this analysis. Significantly more dilution would occur as the stream discharges to, and mixes with, the Savannah River.

2.4.13.1.4 Compliance with 10 CFR Part 20

The radionuclide transport analysis presented in Section 2.4.13.1.3 demonstrates that each of the radionuclides that could be accidentally released to groundwater would be individually below its MPC. However, 10 CFR Part 20, Appendix B, Table 2, imposes additional requirements when the identity and concentration of each radionuclide in a mixture are known. In this case, the ratio present in the mixture and the concentration otherwise established in 10 CFR Part 20 Appendix B for the specific radionuclide not in a mixture must be determined. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity").

This sum of fractions approach was applied to the radionuclide concentrations conservatively estimated in Section 2.4.13.1.3. Results are summarized in Table 2.4.13-5. The ratios for the mixture sum to 0.010, which is well below unity. Therefore, it is concluded that an accidental liquid release of effluents in groundwater would not exceed 10 CFR Part 20 limits.

2.4.13.2 Surface Water

No outdoor tanks contain radioactivity in the Westinghouse AP1000 design **(Westinghouse 2006)**. In particular, the AP1000 design does not require boron changes for load follow and does not recycle boric acid or reactor coolant water, so the boric acid tank is not radioactive. Because no outdoor tanks contain radioactivity, no accident scenario could result in the release of liquid effluent directly to the surface water.

Chapter 15 Accident Analyses

This chapter presents the required 10 CFR 52.17(a)(1), "Contents of Applications," early site permit (ESP) application analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site with respect to the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1).

15.1 Selection of Accidents

The *AP1000 Design Control Document (DCD)* design bases accidents are considered in this chapter **(Westinghouse 2005)**. Table 15-1 shows the NUREG-0800 Standard Review Plan (SRP) section numbers and accident descriptions, as well as the corresponding accidents as defined in the AP1000 DCD. Although only those accidents identified in Regulatory Guide 1.183, *Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors*, July 2000 (RG 1.183), are required to be evaluated, the radiological consequences of all the accidents listed in Table 15-1 are assessed to demonstrate that new units could be sited at the VEGP site without undue risk to the health and safety of the public.

15.2 Evaluation Methodology

The AP1000 DCD presents the radiological consequences for the accidents identified in Table 15-1. The DCD design basis analyses are updated with VEGP site data to demonstrate that the DCD analyses are bounding for the VEGP site. The basic scenario for each accident is that some quantity of activity is released at the accident location inside a building and this activity is eventually released to the environment. The transport of activity within the plant is independent of the site and specific to the AP1000 design. Details about the methodologies and assumptions pertaining to each of the accidents, such as activity release pathways and credited mitigation features, are provided in the DCD.

The dose to an individual located at the exclusion area boundary (EAB) or the low population zone (LPZ) is calculated based on the amount of activity released to the environment, the atmospheric dispersion of the activity during the transport from the release point to the offsite location, the breathing rate of the individual at the offsite location, and activity-to-dose conversion factors. The only site-specific parameter is atmospheric dispersion. Site-specific doses are obtained by adjusting the DCD doses to reflect site-specific atmospheric dispersion factors (χ/Q values). Since the site-specific χ/Q values are bounded by the DCD χ/Q values, this approach demonstrates that the site-specific doses are within those calculated in the DCD.

Chapter 17 Quality Assurance

17.1 ESP Quality Assurance

The Quality Assurance Program, used for development of the Vogtle Electric Generating Plant Early Site Permit (ESP) application, is described in the Southern Nuclear Operating Company, Inc. (SNC) Nuclear Development Quality Assurance Manual. This manual, and associated implementing procedures, provide for control of SNC activities that have the potential to affect the quality of safety related nuclear plant structures, systems, and components of the proposed new units. The SNC Nuclear Development Quality Assurance Manual, included as Appendix 17.1A, is a separately controlled document and therefore, does not conform to the ESP application formatting.

2.5 Geology, Seismology, and Geotechnical Engineering

This section presents information on the geological, seismological, and geotechnical engineering properties of the VEGP site. Section 2.5.1 describes basic geological and seismologic data. Section 2.5.2 describes the vibratory ground motion at the site, including an updated seismicity catalog, description of seismic sources, and development of the Safe Shutdown Earthquake (SSE) ground motion. Section 2.5.3 describes the potential for surface faulting in the site area, and Sections 2.5.4, 2.5.5, and 2.5.6 describe the stability of subsurface materials and foundations at the site.

NRC Regulatory Guide 1.165, *Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion* (RG 1.165) (1977), Appendix D, *Geological, Seismological and Geophysical Investigations to Characterize Seismic Sources*, provides guidance for the level of investigation recommended at different distances from a proposed site for a nuclear facility.

The following four terms for site map areas are designated by RG 1.165:

- Site region - area within 200 mi (320 km) of the site location.
- Site vicinity - area within 25 mi (40 km) of the site location.
- Site area - area within 5 mi (8 km) of the site location.
- Site - area within 0.6 mi (1 km) of the proposed VEGP Unit 3 and 4 locations.

These terms are used in Sections 2.5.1 through 2.5.3 to describe these specific areas of investigation. These terms are not applicable to other sections of this ESP application.

SNC conducted field investigations and performed extensive research of relevant geologic literature to reach the conclusion that no geologic or seismic hazards have the potential to affect the VEGP site except the Charleston seismic zone and a small magnitude local earthquake occurring in the site region. These topics are discussed in greater technical detail in Section 2.5.2. There is only limited potential for non-tectonic surface deformation in shallow deposits within the 5-mi site area radius, and this potential can be mitigated by means of excavation.

2.5.1 Basic Geologic and Seismic Information

This section presents information on the geological and seismological characteristics of the VEGP site region and site area. The information is divided into two parts. Section 2.5.1.1 describes the geologic and tectonic setting of the site region (200 mi), and Section 2.5.1.2 describes the geology and structural geology of the site area (5 mi). The geological and

SSAR 2.5 Geology and Seismic

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Topics:

- 2.5.1 Site and Regional Geology (82 pp+ 1 tab + 45 figs + 281 ref)
- 2.5.2 Seismic Evaluation (53 pp + 22 tab + 44 figs + 84 ref)
- 2.5.3 Surface Faulting (18 pp + 2 figs + 37 ref)
- 2.5.4 Stability of Subsurface Mat'ls (34 pp + 13 tabs + 14 figs + 35 ref)
- 2.5.5 Stability of Slopes (1 pg)
- 2.5.6 Embankments and Dams (1 pg)
- 2.5A Soil Boring Report (674 pp)
- 2.5B Seismic Reflection Survey (29 pp)

Key Items for Discussion:

- *Questions from April 14 NRC Meeting*
- *Pen Branch Fault*
- *Safe Shutdown Earthquake (SSE) Curve*

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SSAR 2.5 Geology and Seismology

Questions from April 14 NRC Meeting:

1. East Tennessee Seismic Zone
2. Use EPRI G-Tasks
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4. ASCE "FOSID" versus Seismic CDF Method
5. Supporting evidence that Pen Branch is noncapable
6. SSE control point at bearing layer versus top of backfill

Rondout teams were also assigned large upper-bound Mmax values of **M** 7.2.

Subsequent hazard studies have used Mmax values within the range of maximum magnitudes used by the six EPRI models. Collectively, upper-bound maximum values of Mmax used by the EPRI teams ranged from **M** 6.3 to 7.5. Using three different methods specific to the Eastern Tennessee seismic source, Bollinger (1992) estimated an Mmax of **M** 6.3. The USGS source model assigns a single Mmax value of **M** 7.5 for the ETSZ **(Frankel et al 2002)**. Both of these more recent estimates of Mmax for the ETSZ are captured by the range of Mmax values used in EPRI (NP-4726 1986). Therefore, it is concluded that no new information has been developed since 1986 that would require a significant revision to the EPRI seismic source model.

For the VEGP ESP site, the contribution to hazard from the ETSZ sources in the EPRI study was minimal. With the exception of the Law source 17 (Eastern Basement), none of the ETSZ sources contributed more than one percent of the site hazard, and thus were excluded from the final hazard calculations **(EPRI NP-6452-D 1989)**. The ground motion hazard at the VEGP ESP site is dominated by the Charleston seismic source, and the inclusion of new recurrence values for Charleston based on paleoliquefaction serves to increase the relative contribution of Charleston with respect to any distant source, such as the ETSZ. No modifications to the EPRI parameters for ETSZ source zones were made as part of this ESP study.

2.5.2.3 Correlation of Seismicity with Geologic Structures and EPRI Sources

The final part of the review and update of the 1989 EPRI seismic source model was a correlation of updated seismicity with the 1989 model source. The EPRI seismicity catalog covers earthquakes in the CEUS through 1984, as described in Section 2.5.2.1. Figures 2.5.2-1 through 2.5.2-6 shows the distribution of earthquake epicenters from both the EPRI (pre-1985) and updated (post-1984 through April 2005) earthquake catalogs in comparison to the seismic sources identified by each of the EPRI ESTs.

Comparison of the additional events of the updated earthquake catalog to the EPRI earthquake catalog shows:

- There are no new earthquakes within the site region that can be associated with a known geologic structure.
- There are no unique clusters of seismicity that would suggest a new seismic source not captured by the EPRI seismic source model.
- The updated catalog does not show a pattern of seismicity that would require significant revision to the geometry of any of the EPRI seismic sources.

SSAR 2.5 Geology and Seismology

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2.5.2.5.1 Development of Site Amplification Functions

2.5.2.5.1.1 Methodology

The method adopted here to account for the effects of surficial soils on seismic hazard follows the recommended procedure in NUREG CR-6769 (**McGuire et al. 2002**), described as "Approach 2A/3." This procedure requires 6 steps:

1. The seismic hazard is calculated for hard rock conditions for the seven structural frequencies, over a range of ground motion amplitudes, resulting in a range of annual frequencies of exceedance.
2. For a range of critical ground motion amplitudes corresponding to annual frequencies of 10^{-4} to 10^{-6}, the seismic hazard is deaggregated at 10 Hz and 1 Hz to determine the dominant magnitudes and distances for those amplitudes.
3. High-frequency spectra are developed to represent earthquakes dominating the 10 Hz ground motions, and low-frequency spectra are developed to represent earthquakes dominating the 1 Hz ground motions. These spectra represent the mean magnitude and distance of earthquakes that dominate the seismic hazard at those structural frequencies.
4. The rock and soil column is modeled, and soil amplitudes are calculated at control point elevations for input hard rock motions corresponding to frequencies of exceedance of 10^{-4}, 10^{-5}, and 10^{-6}. These calculations are made separately for ground motions dominating the 10 Hz hard rock motion and the 1 Hz hard rock motion, and the input motions have a spectrum determined by the high- or low-frequency spectral shape, as appropriate. Multiple hard rock motions are used, and multiple soil column properties are used, so that the uncertainty in soil amplitudes can be quantified.
5. The soil amplification factors AF (soil/hard rock) as a function of input hard rock amplitude are evaluated for each structural frequency and amplitude, and the envelope calculation is selected. This is the motion (high-frequency or low-frequency) that gives the highest mean soil motion, for that structural frequency and input hard rock amplitude.
6. The envelope AF factors and the associated uncertainties in soil response are convolved with the hard rock hazard, for each structural frequency, to obtain seismic hazard curves at the control point elevations.

This gives an accurate calculation of the soil hazard at the desired control point elevation. In step 3, it is sufficiently accurate to use the mean magnitude to generate spectral shapes for the high- and low-frequency spectra. Using multiple magnitudes does not materially affect the calculated soil spectra, as documented in NUREG CR-6769 (**McGuire et al. 2002**).

designed to the scaled spectral amplitudes will achieve a target performance goal corresponding to a mean annual frequency of onset of significant inelastic deformation (FOSID) of 10^{-5} per year. The soil hazard curves that form the basis for this calculation were developed following Approach 2A/3 described in Section 2.5.2.5.1.1.

2.5.2.6.2 Discrete Frequency SSE Response Spectrum Amplitudes

Ground motion amplitudes corresponding to MAFEs of 10^{-4} and 10^{-5} for hard rock conditions (SA developed in Section 2.5.2.4) are shown in Table 2.5.2-21, and ground motion amplitudes for the free ground surface of a hypothetical outcrop point of the highest competent in situ layer (top of Blue Bluff Marl) are also shown in Table 2.5.2-21 developed from the hard rock motions and the amplification factors of Section 2.5.2.5.

The SSE (the design response spectrum (DRS) in the nomenclature of the ASCE 43-05 **(ASCE 2005))** standard is derived from the amplitudes in Table 2.5.2-21,. That is, the Amplitude Ratio A_R of 10^{-5} to 10^{-4} amplitudes is determined for spectral accelerations (SA) at each structural frequency:

$$A_R = SA(10^{-5})/SA(10^{-4}) \qquad \text{(Equation 2.5.2-4)}$$

and the SSE is calculated as:

$$SSE = SA(10^{-4}) \times \max(1.0, 0.6\, A_R^{0.8}) \qquad \text{(Equation 2.5.2-5)}$$

Table 2.5.2-22 shows SSE values calculated from Equation 2.5.2-5, at the free ground surface of a hypothetical outcrop of the top of Blue Bluff Marl.

2.5.2.6.3 Full SSE Spectrum

The SSE values at seven discrete structural frequencies in Table 2.5.2-22 are used to scale spectral shapes to develop a broad SSE ground motion response spectrum. The basis for the shape of the design spectrum is the calculation of site response at 300 frequencies between 100 and 0.1 Hz, generally following the guidance of RG 1.165. That is, two ground motion spectra are used as input to the site response calculation. For frequencies of 1 Hz and below, the low-frequency hard rock motion described in Section 2.5.2.5.1.1 governs responses for these frequencies. For frequencies of 10 Hz and higher, the high-frequency hard rock motion governs responses. At intermediate frequencies, the controlling hard rock motion and amplification factors are those that produce the highest soil response at that frequency.

The site mean amplification factors for the 300 frequencies are used to generate spectral shapes by following the ASCE 43-05 recommendations for design spectra. That is, an approximate 10^{-4} soil spectrum is created by amplifying the 10^{-4} hard rock spectrum by the mean amplification factor for 10^{-4}, and similarly for 10^{-5}. In addition a soil spectral shape is

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Pen Branch Fault - ESP Research

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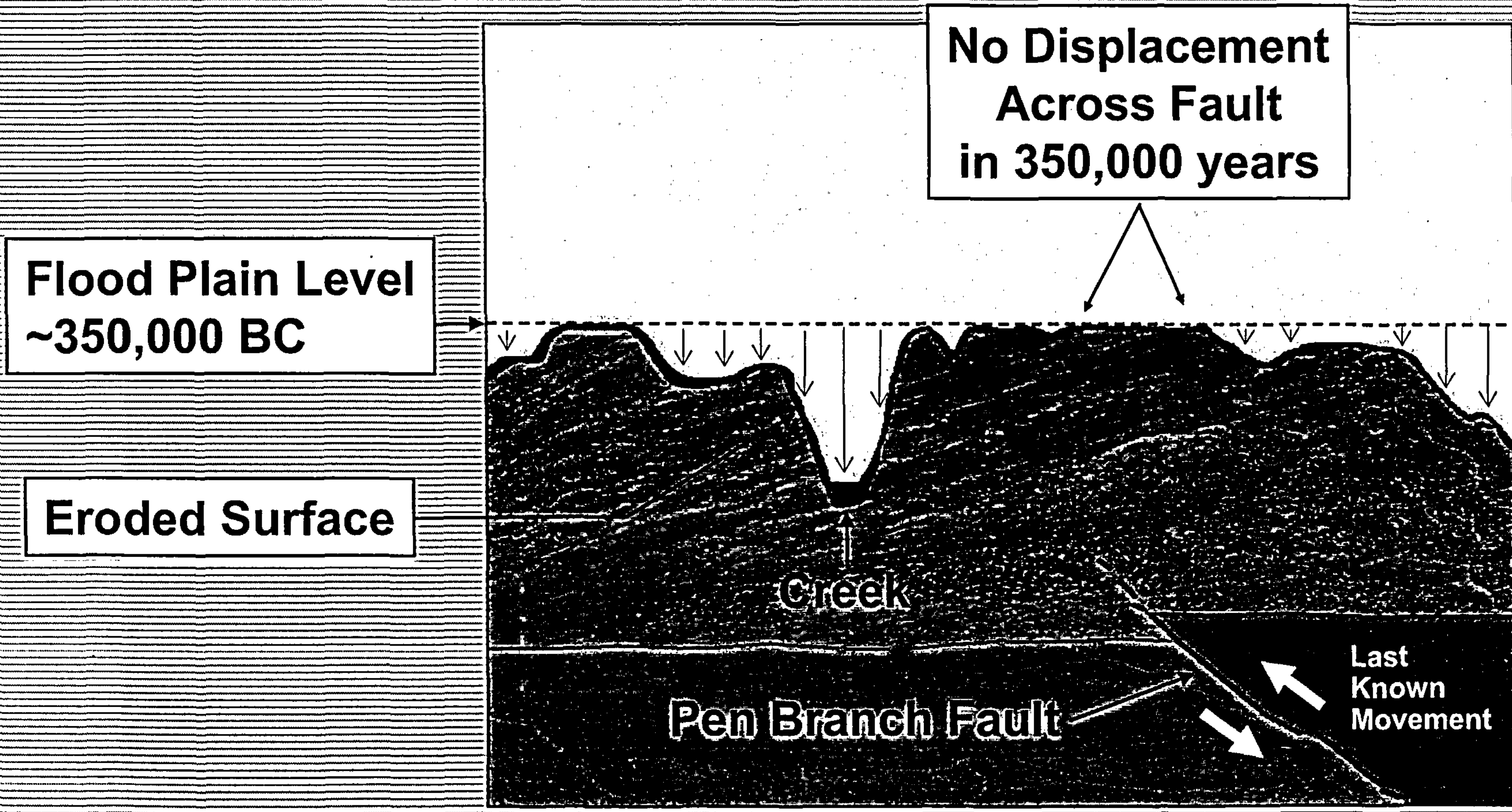

Figure 2.5.1-44 Geomorphic Map Showing Best Preserved Remnants of QTE Terrace Surface (Red Shading) in Study Area at the SRS. Yellow Ds Indicate Dissolution Collapse-Related Depressions. Base Image is 1943 Aerial Photograph

Figure 2.5.1-44 Geomorphic Map Showing Best Preserved Remnants of QTE Terrace Surface (Red Shading) in Study Area at the SRS. Yellow Ds Indicate Dissolution Collapse-Related Depressions. Base Image is 1943 Aerial Photograph

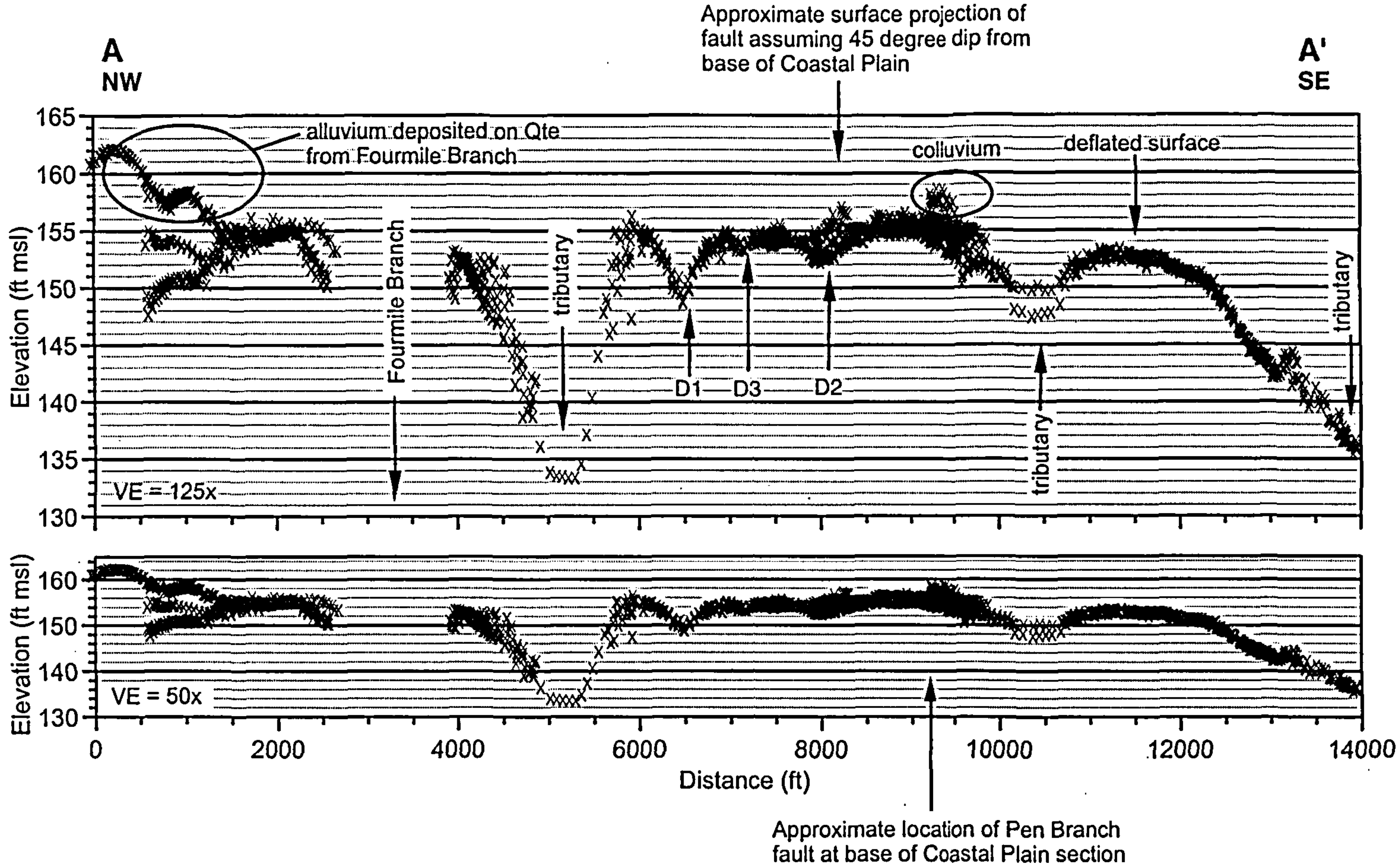

Figure 2.5.1-45 Longitudinal Profile A-A' from SRS Qte Terrace Surface. Points Interpreted as Representing the Best-preserved Remnant of the Qte Surface Are Shown in Red, all Other Points that Do Not Represent the Terrace Are Shown in Gray.

the overall Qte terrace surface that cannot be explained by erosion, settlement, deposition, and/or anthropogenic modification can be considered to be of possible tectonic origin.

Survey error – The uncertainty due to both systematic and random errors associated with the collection and processing of survey data is estimated to be about 3 cm (about 1.2 inches) in the horizontal dimension and about 5 cm (about 2 inches) in the vertical dimension. The contribution of survey error to overall uncertainty is considered to be negligible.

Profile construction error – The projection of elevation data onto profile line A-A' (Figure 2.5.1-45) introduces a minimal amount of error into the analysis. The magnitude of the positional error resulting from profile construction is minimized by minimizing the distance over which points are projected, and by constructing the profile approximately parallel to the long-axis of the Qte terrace surface in the study area and approximately normal to the local strike of the Pen Branch fault. The amount of error introduced into this analysis from the construction of the longitudinal profile is minimal.

Results

The geomorphic map presented in Figure 2.5.1-44 shows the best-preserved remnants of the Qte terrace surface in the study area (red shaded areas). The influence of dissolution collapse-related depressions on the terrace surface is most clearly seen in the vicinity of depressions D1 and D2, as short-wavelength variations in the topographic surface. In addition, portions of the Qte terrace surface have been sites for the local deposition of alluvium and colluvium. These two areas are located at the northwestern-most extent of the survey and southeast of depession D2 (Figure 2.5.1-45).

Taken together, the overall uncertainty in the elevation of the best-preserved remnants of the Qte terrace surface is estimated to be about 3 ft. As shown in Figure 2.5.1-45, the elevation data for the terrace remnant range between elevations of 153 and 156 ft.

Longitudinal profile A-A' (Figure 2.5.1-45) indicates about 25 ft of variability in the present topography of the Qte terrace deposit in the study area. Most of this variability is the result of erosion and deflation of the terrace surface.

A longitudinal profile of the Qte fluvial terrace surface in the study area provides evidence demonstrating the absence of discernible tectonic deformation due to the underlying Pen Branch fault within the limit of resolution of the terrace elevation data (Figure 2.5.1-45). The results of this study demonstrate a lack of tectonic deformation in the 350 ka to 1 Ma year old fluvial terrace surface within a resolution of about 3 ft. This observation is consistent with previous studies at both the VEGP site and the SRS that have concluded the Pen Branch fault is not a capable tectonic source.

SSAR 2.5 Geology and Seismology

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II Marl Bearing Stratum (Blue Bluff Marl or Lisbon Formation) – slightly sandy, cemented, calcareous clay.

III Lower Sand Stratum (comprises several formations from the Still Branch just beneath the Blue Bluff Marl to the Cape Fear just above the Dunbarton Triassic Basin rock) – fine to coarse sand with interbedded silty clay and clayey silt.

IV Dunbarton Triassic Basin Rock – red sandstone, breccia, and mudstone, weathered along the upper 120 ft.

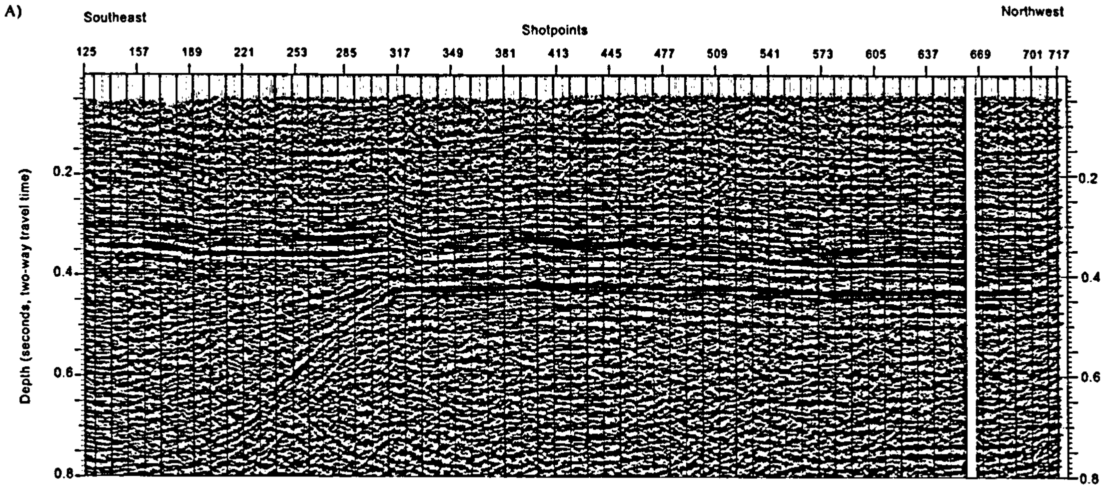
V Paleozoic Crystalline Rock – a competent rock with high shear-wave velocity that underlies the Triassic Basin rock. The non-capable Pen Branch fault, forms the boundary between the Triassic Basin and Paleozoic basement rocks (see Section 2.5.1.2.4 for a detailed discussion of the Pen Branch fault).

The Upper Sand Stratum (Barnwell Group) will be removed because it is not considered competent material. It is susceptible to liquefaction (Section 2.5.4.8) and dissolution-related ground deformation (Section 2.5.3.8.2); also the shear-wave velocity of the Upper Sand Stratum is generally below 1000 ft/sec, see Table 2.5.4-6.

Therefore the highest in situ competent material for the VEGP ESP site is the Blue Bluff marl at 86 ft depth. Its shear-wave velocity is greater than 1000 ft/sec with the average value of 2,354 ft/sec (Section 2.5.4.4.2.1). For soil characteristics like those found at the VEGP ESP site, the "free ground surface" of a hypothetical outcrop is judged compatible with the words "free ground surface" in 100.23 (d) (1) of 10 CFR Part 100 and the guidance provided in NUREG-0800 Section 3.7.1 on defining the "free ground surface." Therefore the VEGP ESP SSE is defined in the free field on the free ground surface of a hypothetical outcrop of the Blue Bluff Marl.

All safety-related structures will be founded on structural backfill that will be placed on top of the Blue Bluff Marl after complete removal of the Upper Sand Stratum. The structural fill will be a sandy or silty sand material following the guidelines used during construction of VEGP Units 1 and 2.

To determine the SSE at the 86-ft depth of the top of the Blue Bluff Marl it is necessary to adjust the uniform hazard hard rock spectra (presented in Section 2.5.2.4) for amplification or deamplification as vibratory ground motion is propagated through the subsurface materials above the 9,200 ft/s shear-wave velocity horizon. This section describes the analyses performed to develop site amplification functions associated with the different hard rock ground motions presented in Section 2.5.2.4. These site amplification functions are used in Section 2.5.2.6 along with the hard rock ground motions to develop site-specific SSE ground motion.



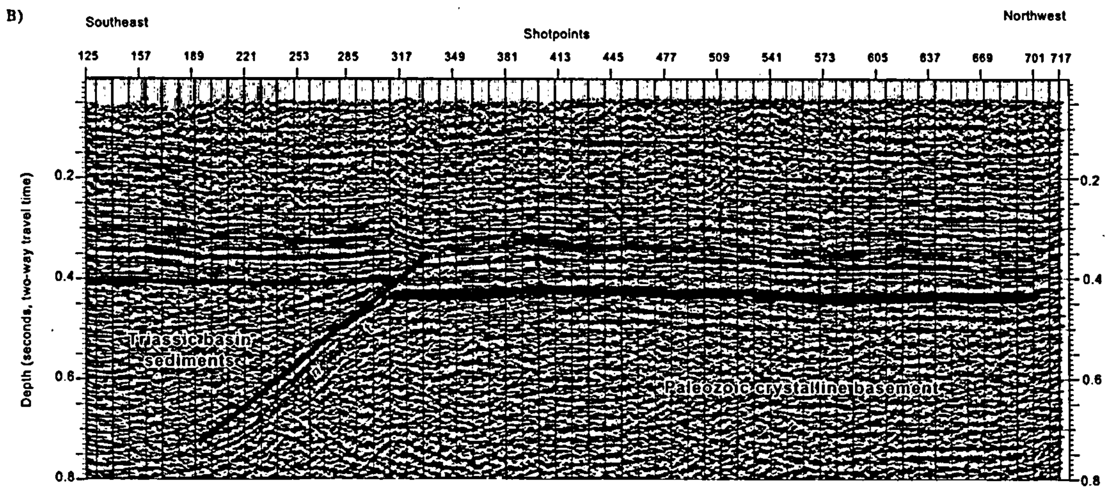
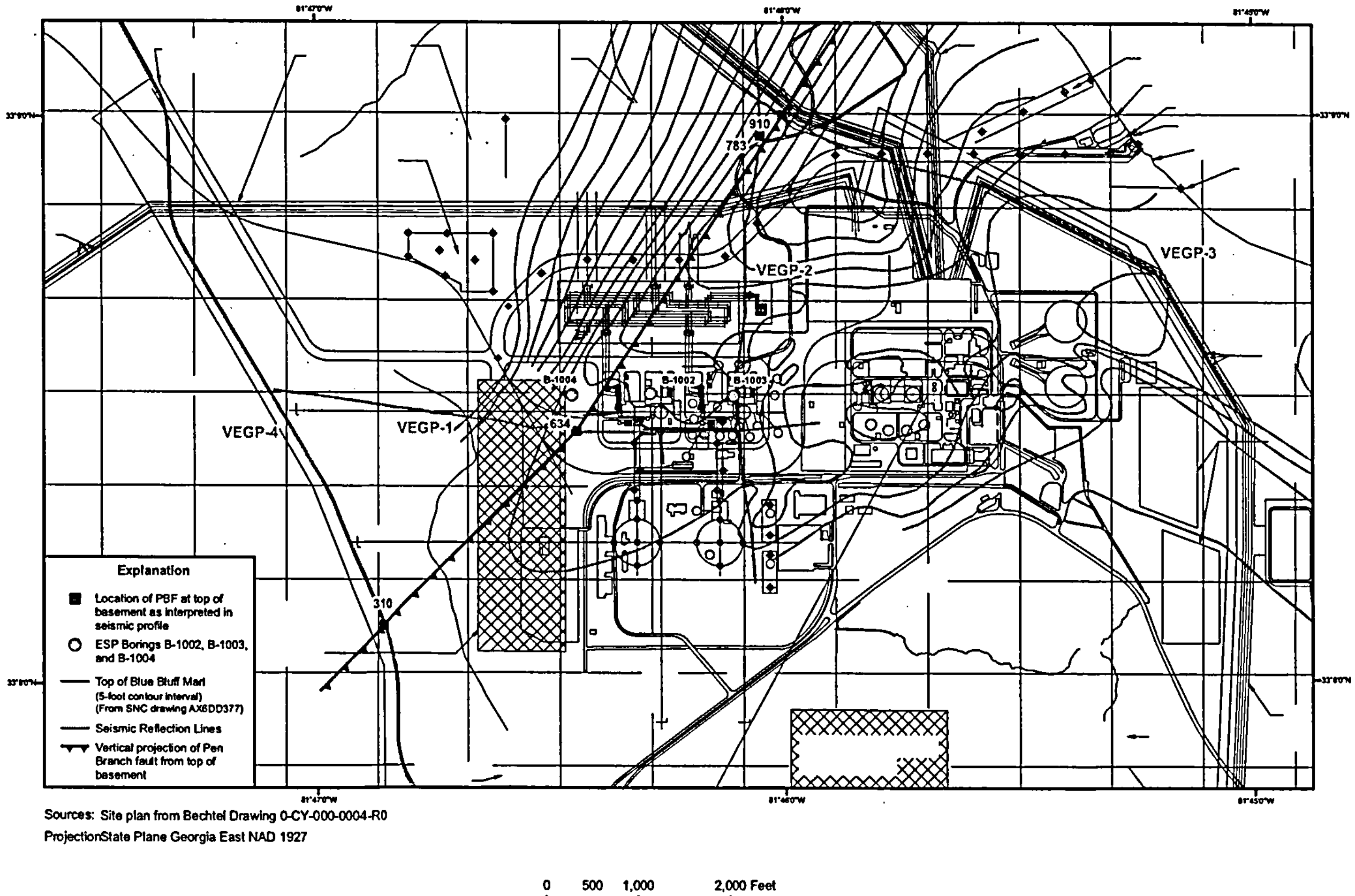


Figure 2.5.1-37 (A) Seismic Reflection Line 4 (Time Section; Display Velocity = 12,000 fps)
(B) Interpretation (Blue Line Represents Top of Basement)



Sources: Site plan from Bechtel Drawing 0-CY-000-0004-R0
ProjectionState Plane Georgia East NAD 1927

Figure 2.5.1-42 VEGP Site Plant Layout

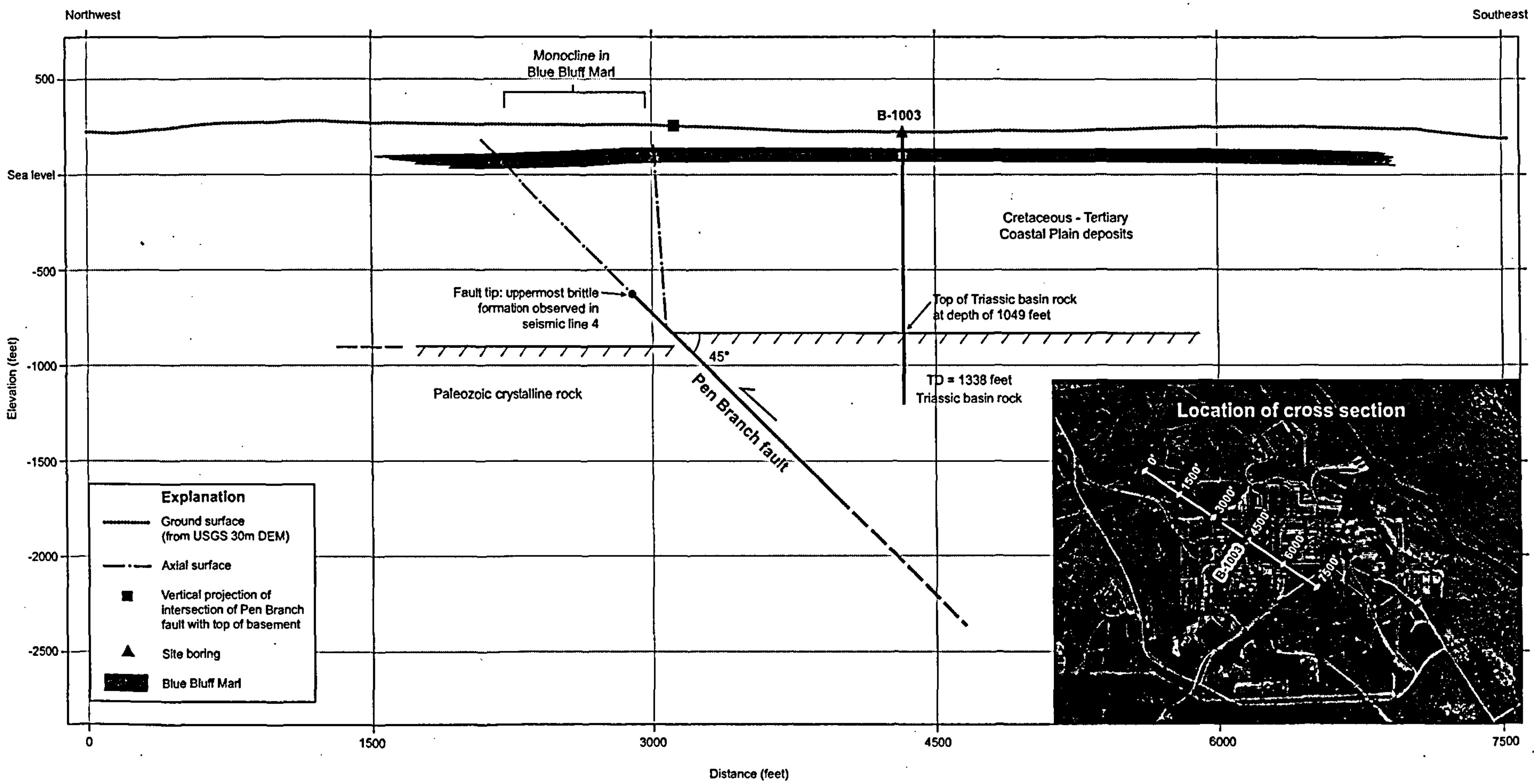


Figure 2.5.1-40 Northwest-Southwest Cross Section Showing Pen Branch Fault Beneath VEGP Site

2.5.1.2.3 Site Area Stratigraphy

The site area stratigraphy is based on site-specific data as well as regional geologic studies and includes the following sources of information:

- Regional geologic maps, studies, and related data
- Site area studies performed for VEGP
- Borehole data, including core and geophysical logs acquired during the ESP investigation (Figure 2.5.1-33)
- Surface geophysical surveys, including seismic reflection and refraction (Figures 2.5.1-34, 2.5.1-35, 2.5.1-36, and 2.5.1-37).

Numerous geologic studies have been conducted in the surrounding area since initial studies were conducted for VEGP Units 1 and 2. Most of these studies were focused in the vicinity of the SRS. Many of these studies focused on correlating both geologic and hydrogeologic formations present in South Carolina and Georgia, resulting in an updated stratigraphic nomenclature. The most current stratigraphic nomenclature from Huddleston and Summerour (1996) and Falls and Prowell (2001) is used below. A correlation chart showing current USGS, Georgia Geological Survey, South Carolina, and SRS and VEGP Units 1 and 2 FSAR nomenclature is provided as Figure 2.5.1-8. A site stratigraphic column based on data from borehole B-1003 is shown on Figure 2.5.1-38.

2.5.1.2.3.1 Basement Rock

Regionally, the basement surface has been leveled by erosion and dips to the southeast approximately 50 ft/mi **(Fallaw and Price 1995)**. Basement rock lithology within the site area consists of Paleozoic crystalline rock as well as Triassic–Jurassic sedimentary rock of the Dunbarton Basin. Basement rock lithology has been determined directly from core data from boring B-1003 and inferred from seismic reflection and refraction surveys performed as part of the ESP investigation. These data are corroborated regionally with other core data and geophysical surveys, as discussed in Section 2.5.1.1.3.5.

Boring B-1003 was drilled within the VEGP site area to acquire detailed stratigraphic, lithologic, geophysical (including natural gamma, electrical resistivity, compressional velocity, and shear wave velocity) and depth-to-basement data. Data from B-1003 identifies Triassic–Jurassic basement rock at a depth of 1,049 ft (-826 ft msl). Data from four seismic reflection and refraction lines described in Section 2.5.1.2.4.2, as well as borehole and seismic reflection data from other regional studies including the SRS **(Cumbest et al. 1992; Snipes et al. 1993a)**, determine the northern boundary of the Dunbarton Basin to strike northeast-southwest across studies, including investigations as part of this ESP study, support the non-capable status of the Pen Branch fault as outlined below:

- NUREG-1137-8 concludes that the Pen Branch fault is not a capable fault and does not represent a hazard to the VEGP site. Similarly, other NRC reviews of the Pen Branch fault for facilities such as the Mixed Oxide Fuel (MOX) Fabrication Facility at SRS have also concluded that the Pen Branch fault is not a capable fault (NURERG-1821).

- The "association clause" of Appendix A 10 CFR 100.23 applies to this discussion as follows: Cumbest et al. (2000) noted that the Pen Branch fault shares characteristics with other Atlantic Coastal Plain faults that are considered non-capable. These characteristics include northeast-southwest strikes, small total offsets of Cenozoic strata in relation to fault age, slip histories that began in the Cretaceous, and offsets that decrease with decreasing age. Cumbest et al. (2000) argued that the abundance of shared characteristics between these faults implies that these faults are genetically related. Several of these faults have been shown to be non-capable. Therefore, Cumbest et al. (2000) concluded that the Pen Branch fault is likely non-capable as well.

- The Pen Branch fault is not exposed or expressed at the surface **(Snipes et al. 1993a; Stieve and Stephenson 1995; Cumbest et al. 2000)**. Reconnaissance work and aerial photograph interpretation performed for the ESP study confirm that there is no exposure of the fault or geomorphic expression of potential Quaternary activity.

- Snipes et al. (1993) investigated a 10- to 20-ft-thick (3- to 6-m-thick) Quaternary light tan soil horizon in railroad cuts overlying the projected trend of the Pen Branch fault at the SRS. They observed no detectable offset of this unit. According to Snipes et al. (1993), the youngest horizon known from borehole studies to be faulted is the top of the Dry Branch Formation of Late Eocene age.

- Geomatrix (1993) evaluated longitudinal profiles along Quaternary fluvial terraces of the Savannah River and concluded that no evidence of terrace surface warping or faulting exists within a resolution of 7 to 10 ft (2 to 3 m). Additionally, as part of the ESP study, local longitudinal terrace profiles across the now well-located Pen Branch fault support the earlier conclusion that no deformation is observed in the terrace remnant of the Ellenton terrace (estimated as 350 ka to 1 Ma) overlying the Pen Branch fault.

- As part of this ESP study, geomorphic analysis of the 350 ka to 1 Ma fluvial terrace overlying the surface projection of the Pen Branch fault at the SRS demonstrates the lack of tectonic deformation of this Quaternary geomorphic surface within a resolution of about 3 ft. Results are described in more detail in Section 2.5.1.2.4.3.

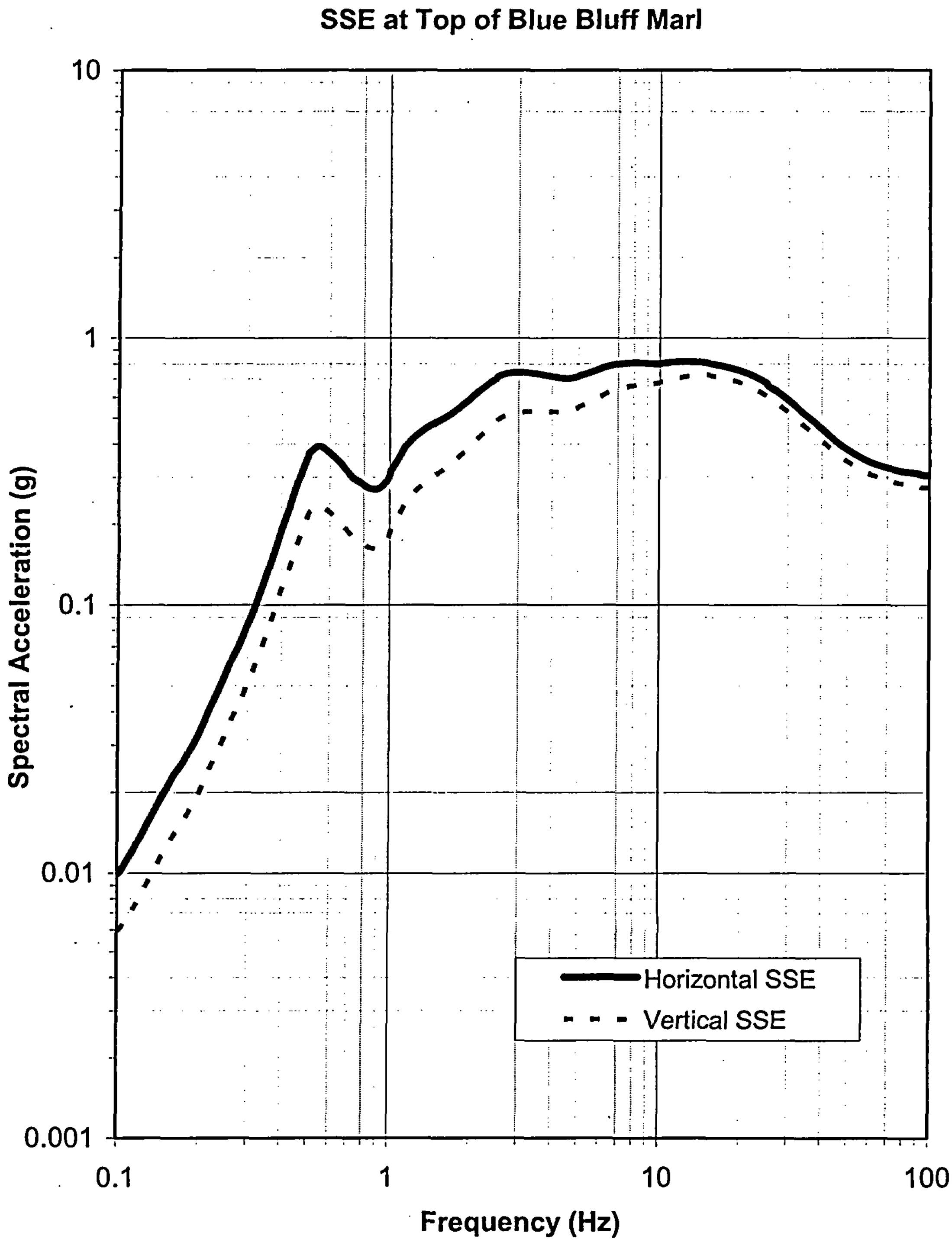
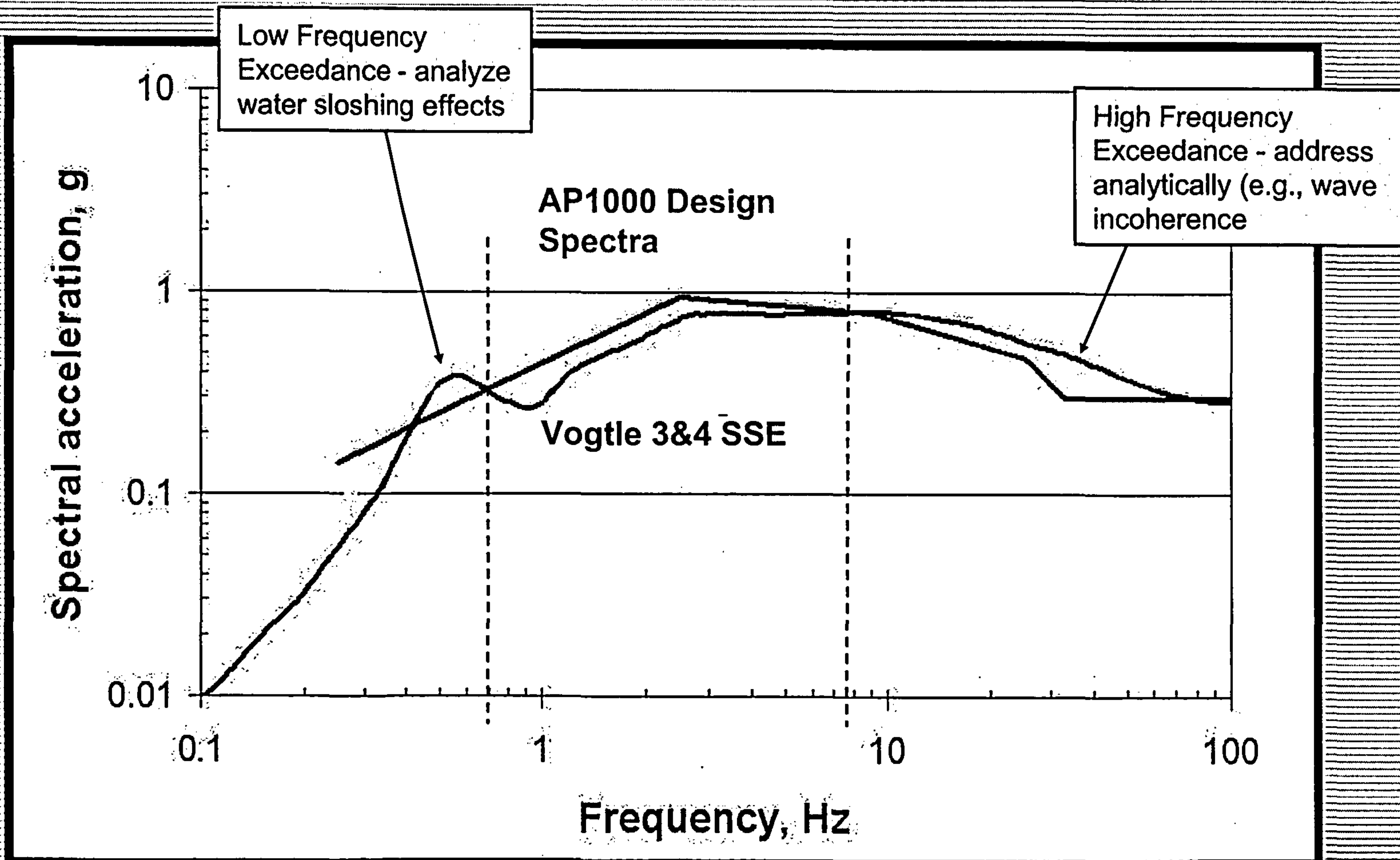


Figure 2.5.2-44 VEGP ESP Horizontal and Vertical SSE Spectra,

SSE Curve



Low Frequency Exceedance - analyze water sloshing effects
AP1000 Design Spectra
High Frequency Exceedance - address analytically (e.g., wave incoherence
Vogtle 3&4 SSE
Spectral acceleration, g
10
1
0.1
0.01
0.1
1
10
100
Frequency, Hz

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ESP presents very detailed understanding of site:

- Research done for existing units
- Experience with excavation & backfill for existing units
- SRS research
- ESP subsurface investigation with deep bore
- Seismic Survey and Pen Branch Location
- Savannah River terrace survey

PUBLIC DISCLOSURE VERSION

Southern Nuclear Operating Company

Early Site Permit Application

for the

Vogtle Electric Generating Plant

Part 3
Environmental Report

Revision 0

Chapter 1 Introduction

1.0 Introduction

In accordance with the provisions of 10 CFR 52, Early Site Permits; Standard Design Certifications; and combined Licenses for Nuclear Power Plants, and supporting guidance, Southern Nuclear Operating Company (SNC or Southern Nuclear) has developed an application to the U.S. Nuclear Regulatory Commission (NRC) for an early site permit. An early site permit (ESP) represents NRC approval of a site or sites for one or more nuclear power facilities, separate from the filing of an application for a construction permit or combined license for such a facility. The SNC ESP application is for the Vogtle Electric Generating Plant (VEGP) site in Burke County, Georgia. In accordance with NRC regulations, SNC has included in its application this environmental report (ER) that analyzes impact to the environment from construction, operation, and decommissioning of two additional nuclear reactors at this site. NRC will use the environmental report in meeting the National Environmental Policy Act (NEPA) requirement that federal agencies consider the impacts that their actions (e.g., permit issuance) might have on the environment.

1.1 Proposed Action

The proposed action is NRC issuance of an early site permit to Southern Nuclear for approval of the VEGP site for one or more nuclear power facilities separate from filing of an application for a construction permit or combined license (COL) for such a facility. This environmental report is submitted as part of the ESP application to support the NRC decision that locating additional nuclear power facilities on the VEGP is environmentally acceptable.

1.1.1 Purpose and Need

Georgia Power Company (GPC), through the Georgia Public Service Commission's Integrated Resource Planning process, has identified a need for additional base load generation by no later than 2015. This need was identified through a detailed economic analysis associated with the IRP process. SNC is submitting the ESP application to preserve the option for new nuclear generation to meet GPC needs as well as the needs projected by the co-owners.

Underlying this need for baseload generation is the role that the State of Georgia and the NRC play in GPC business decision to pursue new nuclear generation. States retain approval authority over the types of electric generation that will be constructed and operated within their borders. However, states (and facility owners) cannot include nuclear power in their generation mix without NRC approval of the construction and operation of a nuclear generation facility. Conversely, NRC approval gives the state a generation option that the state may or may not exercise, at its discretion.

The NRC established the licensing process used by SNC in 10 CFR Part 52. NRC regulation 10 CFR 52 Subpart C, *Combined Licenses*, allows generating entities to apply for a combined license, that is, a combined construction permit and operating license for a nuclear facility. A COL authorizes construction and operation of the facility. Part 52 includes the ability to seek an ESP that allows an applicant to bank a reactor site for up to 20 years prior to obtaining a COL. A COL can reference an ESP for environmental issues.

The ESP process addresses and resolves to the extent addressed site safety, environmental protection, and emergency preparedness issues independent of the process for approving a specific nuclear plant design. As part of an ESP application, the applicant must prepare an environmental report that addresses the safety and environmental characteristics of the site.

An application for a COL can reference an ESP issued under 10 CFR 52 Subpart A, *Early Site Permits*. In general, if the combined license application references an ESP, the application need not contain certain information or analyses submitted to NRC in connection with the early site permit. Instead, the combined license application must contain the following:

- Information and analyses otherwise required
- Information sufficient to demonstrate that the facility falls within the parameters specified in the ESP
- Information to resolve any other significant environmental issue
- not considered in any previous proceeding on the site or design

In accordance with NRC regulations, SNC is taking this first step (i.e., the ESP application) in obtaining for the owners and the state of Georgia the option of including new nuclear capability in their future generation mix. The SNC goal in preparing its ESP application environmental report is to obtain NRC approval of the site and minimize the amount of additional environmental review needed for a COL application, thereby maximizing owner and Georgia assurance that new nuclear capability is a viable generation option.

The ESP also allows for a limited work authorization (LWA) to perform non-safety site preparation activities, subject to redress, in advance of issuance of a COL.

2.3 Water

This section describes the physical and hydrological characteristics of the VEGP site and surrounding region that could affect or be affected by the construction and operation of two new AP1000 units at the VEGP site. The new units will be referred to as VEGP Units 3 and 4. The potential construction and operational impacts of the project on near- and far-field water resources are discussed in Chapters 4 and 5, respectively.

The 3,169-acre VEGP site is located high on a coastal plain bluff on the west bank of the Savannah River in eastern Burke County Georgia. The new AP1000 units will be located approximately 220 feet above mean sea level (msl). This site is located at River Mile 151; approximately 30 river miles upstream of the U.S. Highway 301 Bridge and directly across the river from the Department of Energy's Savannah River Site (Barnwell, South Carolina). It is approximately 26 miles southeast of Augusta, Georgia.

2.3.1 Hydrology

This section describes surface water bodies and groundwater resources that could be affected by the construction and operation of VEGP Units 3 and 4. The site-specific and regional data on the physical and hydrologic characteristics of these water resources are summarized in the following sections

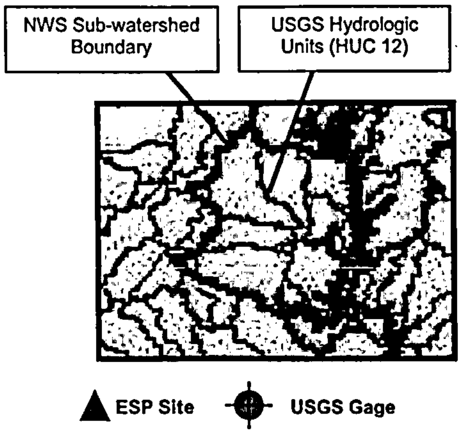
2.3.1.1 Surface Water Resources

The watershed of the Savannah River extends into the mountains of North Carolina, South Carolina, and Georgia near Ellicott Rock, the point where the borders of those three states meet. The river system drains a basin of 10,577 sq mi, divided between the three states as follows **(SR 2006)**:

- 4,581 sq mi in South Carolina
- 5,821 sq mi in Georgia
- 175 sq mi in North Carolina

Within the three states, the Savannah River basin includes portions of 44 counties and two major metropolitan centers, Augusta and Savannah. The lower 50-mi reach of the river is tidally influenced **(USACE 1996)**.

The Savannah River watershed and sub-basins, as delineated by the National Weather Service **(NWS 2005)** and further subdivided by USGS Hydrologic Unit Code (HUC-12) sub-basins **(USGS 2006f)**, are shown in Figure 2.3.1-1. The drainage areas of the NWS sub-basins are given in Table 2.3.1-1.



NWS Sub-Watersheds	
1	Burton Dam, GA
2	Jocasse Dam, SC
3	Keowee Dam, SC
4	Hartwell Dam, GA
5	R. B. Russell Dam
6	Carlton Bridge, GA
7	Clark Hill – Thurmon Dam (upstream)
8	Clark Hill Dam
9	Modoc, SC
10	Steven Creek Dam, GA
11	Augusta 5th Street
12	Augusta/Butler Creek
13	Jackson, SC
14	Burton's Ferry, GA
15	Millvaven, GA
16	Clyo, GA

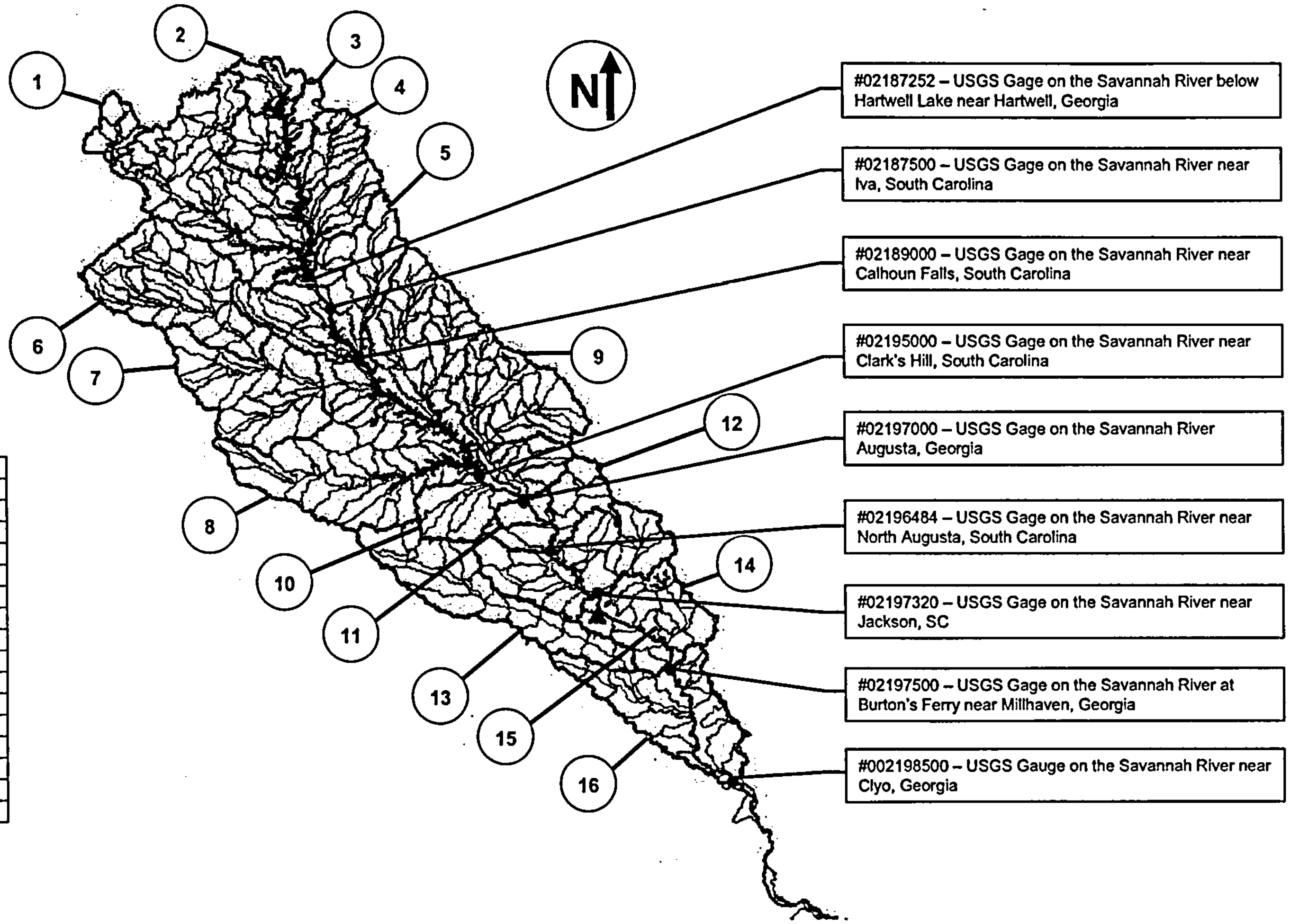
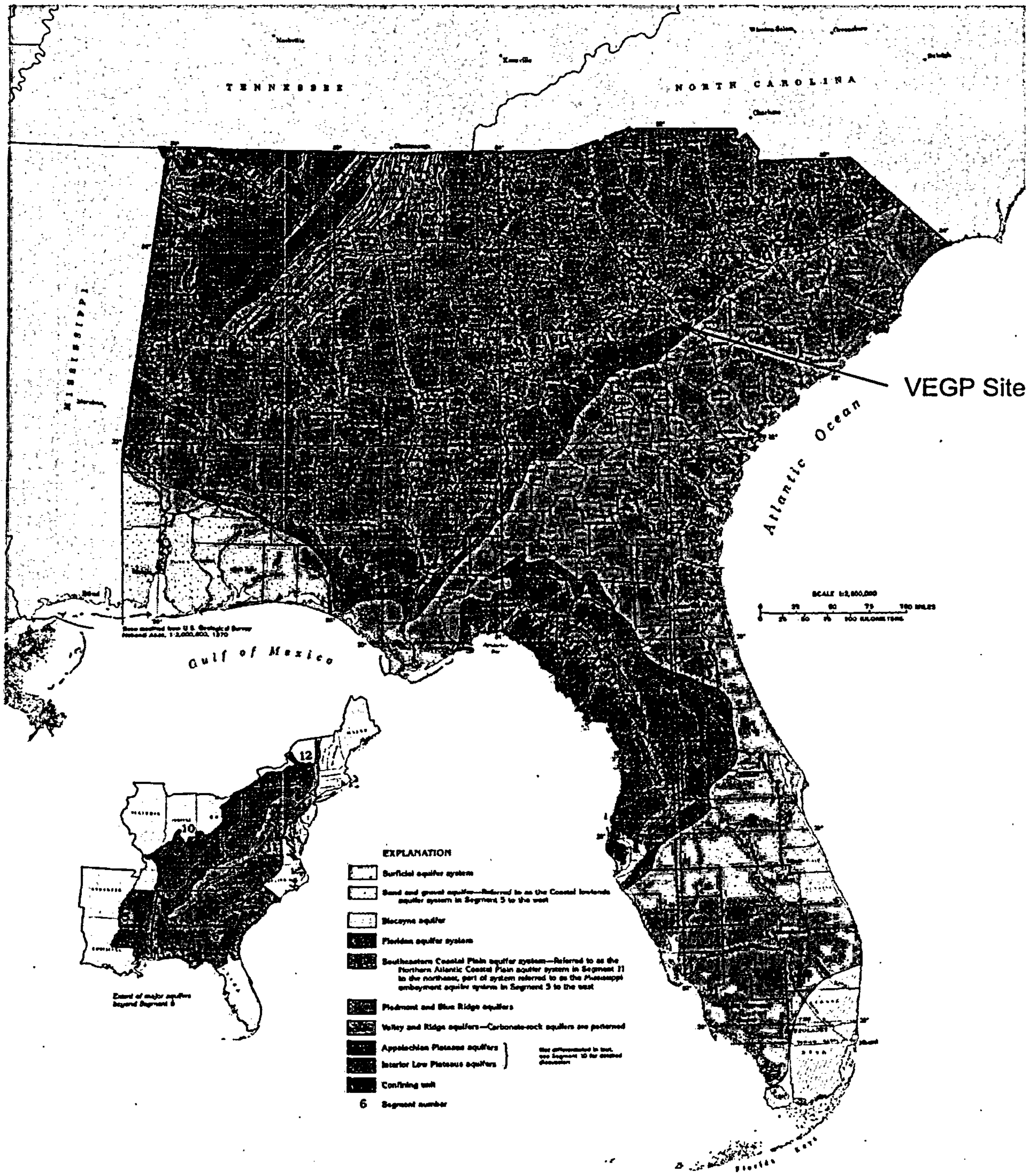


Figure 2.3.1-1 Savannah River Watershed and HUCs (No Scale)



Source: Figure 3 from Miller 1990

Figure 2.3.1-10 Extent of Major Aquifers or Aquifer Systems at the Land Surface in the VEGP Site Region

2.3.2 Water Use

This section describes surface water and groundwater uses that could affect or be affected by the construction or operation of two AP1000 units (VEGP Units 3 and 4) at the VEGP site. Included are descriptions of the types of consumptive and non-consumptive water uses, identification of their locations, and quantification of water withdrawals and returns.

2.3.2.1 Surface Water

The surface water bodies that are within the hydrologic system in which the VEGP site is located and that may affect or be affected by the construction and operation of VEGP Units 3 and 4, include streams and surface water bodies in the Savannah River basin, which extends a length of over 350 mi. The major rivers in the Savannah River basin watershed area include the Tugaloo River, Keowee River, Seneca River, Savannah River, Broad River, two Little Rivers (one in Georgia and one in South Carolina), Stephens Creek, Brier Creek, Horse Creek, and Ebenezer Creek. A number of reservoirs and lakes are also located within the river basin on the Savannah River and its major tributaries **(USGS 1990a; USACE 1993; USACE 1996)**. Among these reservoirs and lakes, three large federal multipurpose projects on the Savannah River—Hartwell Lake and Dam, Richard B. Russell Lake and Dam, and J. Strom Thurmond (also known as Clarks Hill) Lake and Dam—maintain the maximum influence on the river discharge downstream from the J. Strom Thurmond Dam. These reservoirs are respectively located approximately 138, 108, and 71 River Miles upstream from the VEGP site. Figure 2.3.2-1 presents a mosaic of satellite images, and Figure 2.3.2-2 illustrates the major rivers, along with the locations of major reservoirs in the Savannah River basin.

The Savannah River, which is the principal surface water system in the basin, defines the state boundary between Georgia and South Carolina, and nearly all of the river basin area is shared by the two states. The agencies with important roles in the watershed include the US Army Corps of Engineers (USACE), Savannah District, which is responsible for managing the three dams and the in-stream reservoirs of the Savannah River, and the US Environmental Protection Agency (USEPA) in cooperation with the Georgia Environmental Protection Division (EPD) and the South Carolina Department of Health and Environmental Control (SCDHEC), the organizations responsible for maintaining water quality in the basin. Counties located within 50 mi of the VEGP site and within the Savannah River basin are shown in Figure 2.3.2-3 and listed in Table 2.3.2-1.

EPD and SCDHEC maintain the records of surface water and groundwater withdrawals within the river basin for the states of Georgia and South Carolina, respectively. The water withdrawal types defined by EPD and SCDHEC in maintaining state water use databases differ. EPD

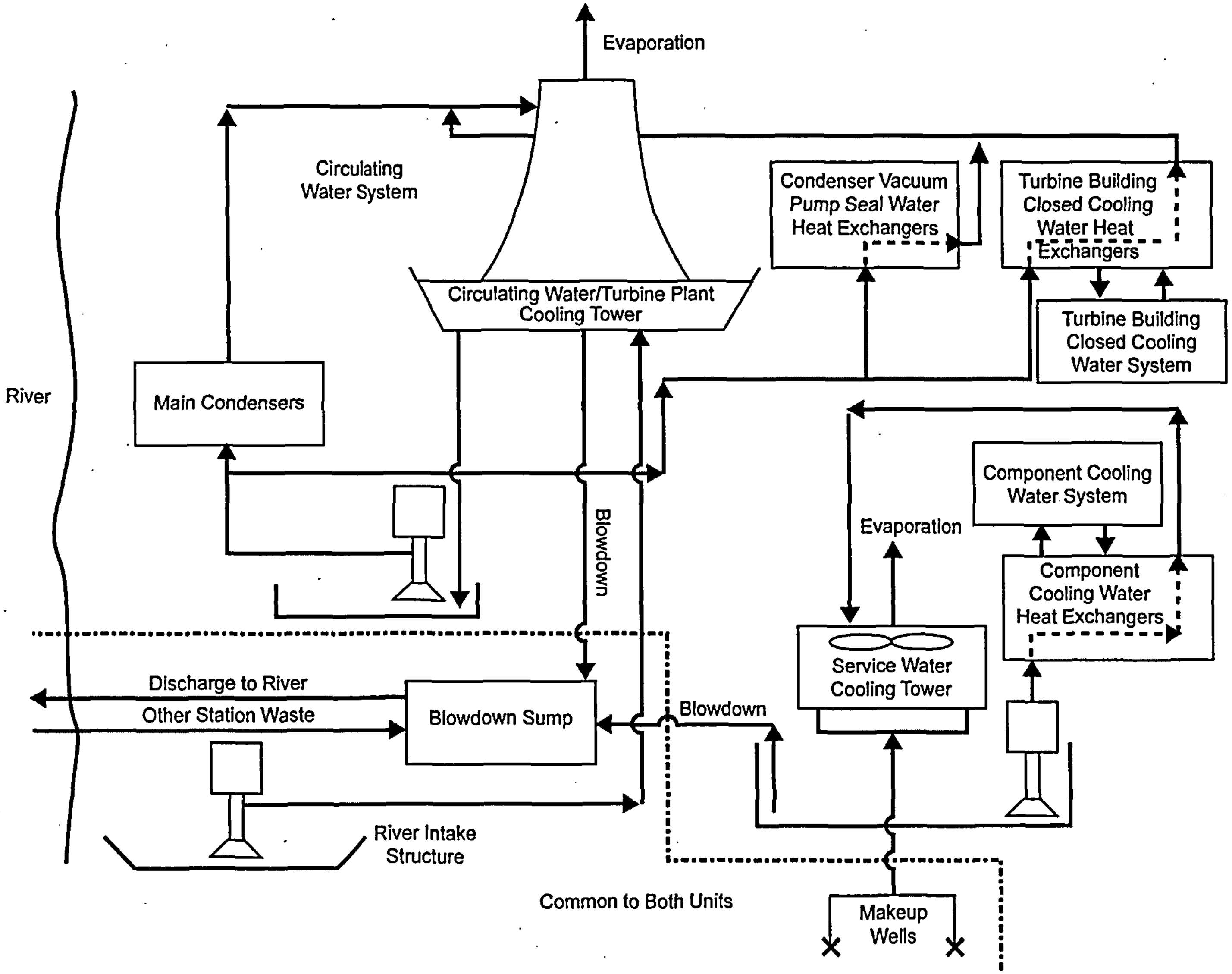


Figure 3.4-1 General Cooling System Flow Diagram

Table 3.3-1 Plant Water Use

Stream Description	Normal Case[a] gpm	Maximum Case[a,b] gpm	Comments
Groundwater (Well) Streams:			
Plant Well Water Demand	752	3,140	
Well Water for Service Water System Makeup	537	2,353	
• Service Water System Consumptive Use	403	1,177	
- Service Water System Evaporation	402	1,176	
- Service Water System Drift	1	1	c
• Service Water System Blowdown	134	1,176	d
Well Water for Power Plant Make-up/Use	215	787	
• Demineralized Water System Feed	150	600	
- Plant System Make-up/Processes	109	519	
- Misc. Consumptive Use	41	81	
• Potable Water Feed	42	140	
• Fire Water System	10	12	
• Misc. Well Water Users	13	35	
Surface Water (Savannah River) Streams			
River Water for Circulating Water / Turbine Plant Cooling Water System Make-up	37,224	57,784	
• Circulating Water / Turbine Plant Cooling Water System Consumptive Use	27,924	28,904	
- Circulating Water / Turbine Plant Cooling Water System Evaporation	27,900	28,880	
- Circulating Water / Turbine Plant Cooling Water System Drift	24	24	c
• Circulating Water / Turbine Plant Cooling Water System Blowdown	9,300	28,880	d

Table 3.3-1 (cont.) Plant Water Use

Stream Description	Normal Case[a] gpm	Maximum Case[a,b] gpm	Comments
Plant Effluent Streams			
Final Effluent Discharge to River	9,608	30,761	
• Blowdown Sump Discharge	9,605	30,561	
- Wastewater Retention Basin Discharge	171	505	
o Miscellaneous Low Volume Waste	129	365	
o Treated Sanitary Waste	42	140	
- Service Water System Blowdown	134	1,176	d
- Circulating Water / Turbine Plant Cooling Water System Blowdown	9,300	28,880	d
- Start-up Pond Discharge	0	0	e
• Treated Liquid Radwaste	3	200	f

NOTES:

[a] The flow rate values are for two AP1000 units.

[b] These flows are not necessarily concurrent.

[c] The cooling tower drifts are 0.002% of the tower circulating water flow.

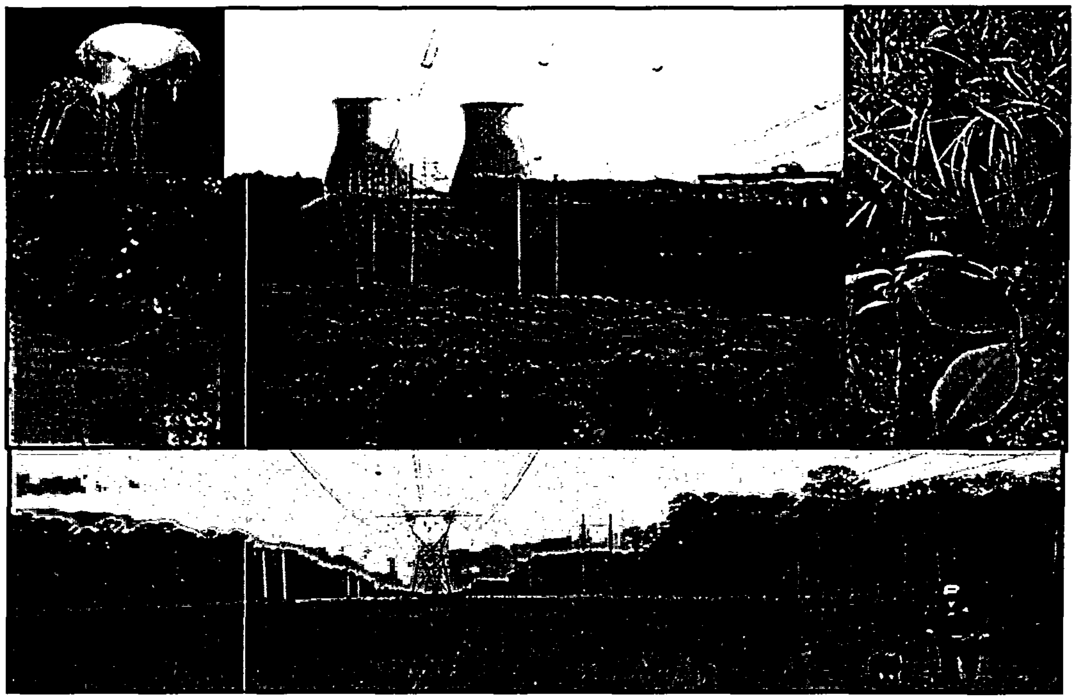
[d] For the normal case, the cooling towers are assumed operating at four cycles of concentration. For the service water cooling tower (maximum case), both unit towers are assumed operating at two cycles of concentration. For the main condenser / turbine auxiliary cooling water tower (maximum case), both towers are assumed operating at two cycles of concentration. Flows are determined by weather conditions, water chemistry, river conditions (circulating water / turbine plant cooling water system only) and operator discretion.

[e] Start-up flushes and start-up pond discharge would occur only during the initial plant start-up phase and potentially after unit outages when system flushes are required.

[f] The short-term liquid waste discharge flow rate may be up to 200 gpm. However, given the waste liquid activity level, the discharge rate must be controlled to be compatible with the available dilution (cooling tower blowdown) flow.

Threatened and Endangered Species Survey Final Report

Vogtle Electric Generating Plant and Associated Transmission Corridors



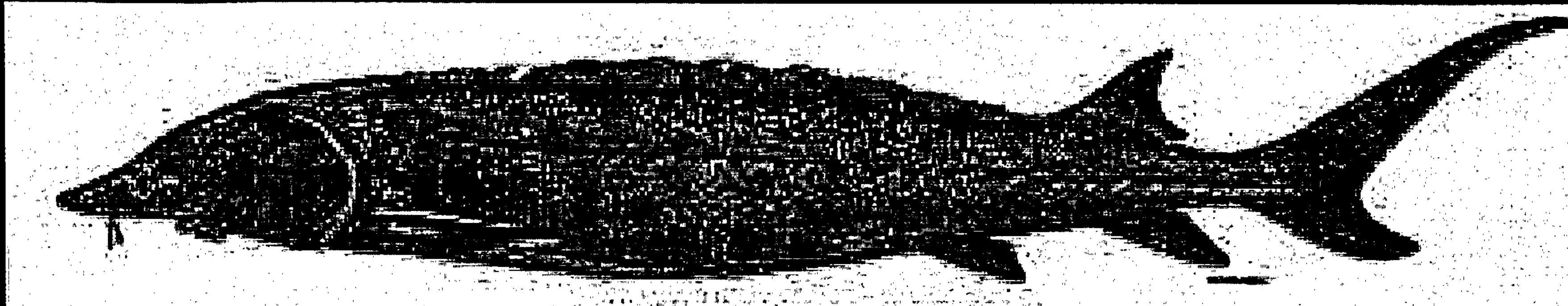
for

Tetra Tech NUS, Inc.
900 Trail Ridge Road
Aiken, South Carolina 29803

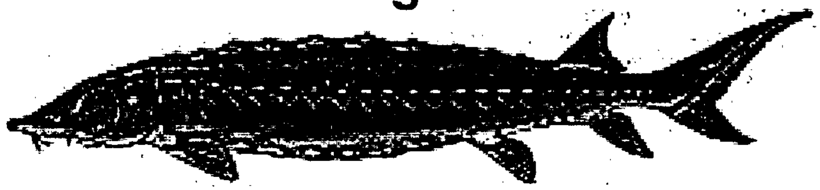
January 16, 2006

THIRDROCK
CONSULTANTS

www.thirdrockconsultants.com
Environmental Analysis & Restoration



Shortnose Sturgeon Fact Sheet



Habitat: Main channel of large rivers, and estuaries; may be found in all water depths in rivers.

Weight: Adults average about 8 pounds.

Length: Adults, 36-38 inches.

Life Expectancy: Ages from 50 to 75 years have been reported (Southern populations less than 20 years).

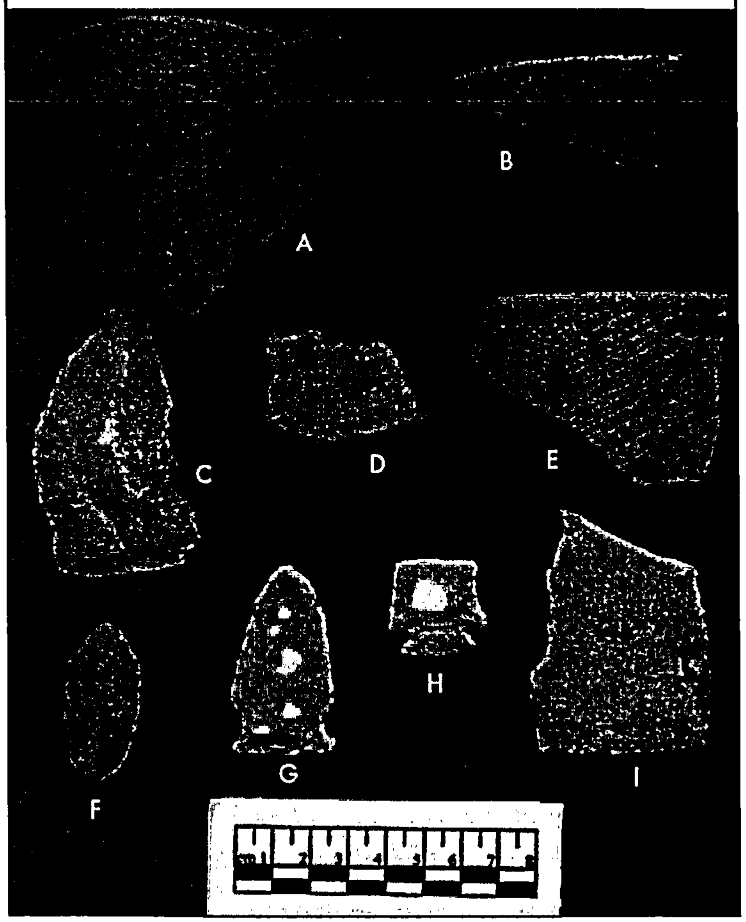
Food: Primarily invertebrates, insects, crustaceans, mollusks, and snails.

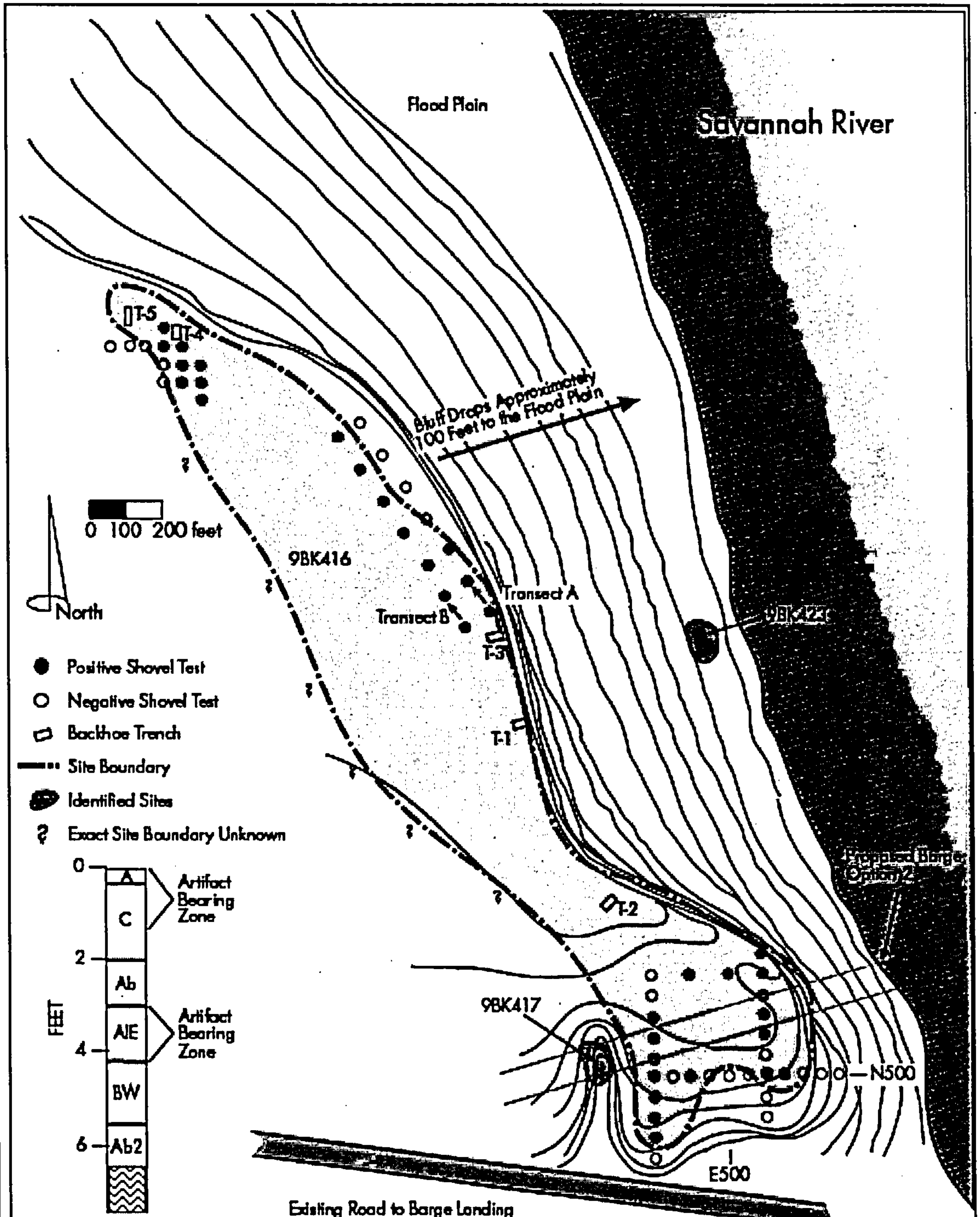
Status: Federally and state endangered

Identification: Sturgeon are primitive-looking fishes, with a heterocercal tail (the upper lobe is much longer than the lower lobe) and a body covered with 5 rows of large bony plates. These heavy, cylindrical fish have an elongated, bony snout, with a tube-like mouth located on the underside of the head. The mouth protrudes several inches when the fish is feeding. Shortnose sturgeon range in color from grayish-olive to brownish above, shading to white on the belly.

Eligible Sites & Artifacts

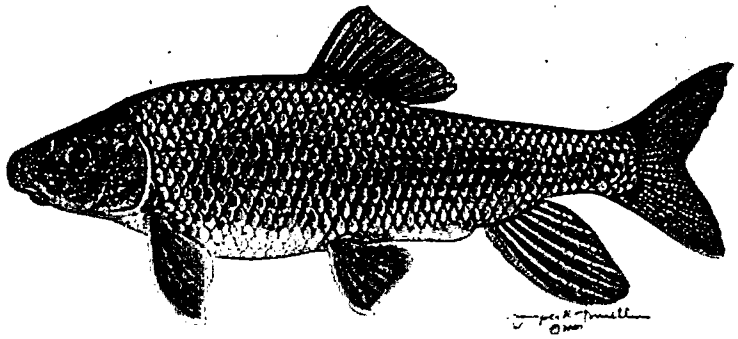
A: Savannah Check Stamped (9BK423); B. Mississippian Check or Complicated Stamped (9BK423);
C. Biface/Hafted Knife (9BK423); D. Sherd Hone (9BK416); E. Deptford Cord Marked (9BK416);
F. Small Guilford-Like ppk (9BK423); G - H. Kirk Corner Notched ppk (9BK416).





Robust Redhorse Fact Sheet

www.robustredhorse.com



The Mystery Fish

The robust redhorse (*Moxostoma robustum*) is a large, long-lived member of the redhorse sucker family. Adults can reach 30 inches in length and weigh up to 17 pounds, although the average length in sample populations is 25 inches and the average weight is 9 pounds. The maximum known age is 27 years. The fish has a thick, robust body with rose-colored fins and a fleshy lower lip.

The robust redhorse was discovered in the Yadkin River North Carolina and first described by Edward Cope in 1869. Yet the fish remained a mystery, unknown to scientists until individuals were captured in the Oconee River, Georgia in 1991. Historically, the robust redhorse occurred in large Atlantic Slope rivers from the Altamaha River drainage in Georgia to the Pee Dee River drainage in North and South Carolina. Wild populations exist in the Ocmulgee and Oconee rivers (Georgia), the Savannah River (Georgia and South Carolina), and the Pee Dee River drainage (North and South Carolina). Successful stocking in the Broad and Ogeechee rivers in Georgia and the Broad and Wateree rivers of South Carolina has re-established historical populations.

Robust Redhorse Conservation Committee

The Robust Redhorse Conservation Committee (RRCC) was created in 1995 to improve the status of the species throughout its former range. The RRCC is a cooperative, voluntary partnership formed under a Memorandum of Understanding (MOU) between state and federal resource agencies, private industry, and the conservation community. Current RRCC members include:

GA Department of Natural Resources
NC Wildlife Resources Commission
SC Department of Natural Resources
US Army Corps of Engineers
US Fish and Wildlife Service
USGS - Biological Resources Division
US Forest Service

Duke Power Company
Georgia Power Company
Progress Energy
Georgia Wildlife Federation
South Carolina Aquarium
South Carolina Electric and Gas Company

In addition to the signatory members, the Georgia River Network, North Carolina Museum of Natural History and Santee Cooper Power are cooperating members. Many university research facilities participate as affiliate members.

Threats to the Species

Much has been learned about the fish since its discovery, but many questions about its habitat, life history, and survival threats remain. The robust redhorse is difficult to sample and may be easily overlooked or misidentified as a closely-related or more common fish. Non-spawning adults prefer deep, moderately swift areas of the river, often near woody debris. Spawning occurs over clean, shallow gravel deposits in swift current. Adults crush shells with molariform pharyngeal teeth and feed on bivalves including the invasive, exotic Asiatic clam (*Corbicula*).

Threats to the species may include:

- Limited population ranges;
- Low rate of recruitment to populations;
- Predation from the non-native flathead and blue catfish;
- Reduced habitat quality due to erosion and sedimentation from land disturbances; and
- Habitat loss and disruption of spawning migrations resulting from impoundments and dams.

Partnership Accomplishments

The RRCC is currently facilitating recovery efforts and conservation measures by conducting research to answer scientific questions and address management needs including:

- Habitat use and movement;
- Early life history, population dynamics and genetics research;
- Discovery of additional populations, supplemental stocking of existing populations, and re-establishment of historical populations; and
- Public education.

In addition, the RRCC adopted a Conservation Strategy to establish short- and long-term conservation goals and management actions, and has developed Policies to describe the current understanding of the robust redhorse and the processes under which the partnership operates.

If you believe you have seen or captured a robust redhorse or want more information, contact:

Jimmy Evans, Fisheries Section
Georgia Department of Natural Resources
1014 Martin Luther King Boulevard
Fort Valley, Georgia 31030
478-825-6151
jimmyevans@cstel.net

Ross Self, Freshwater Fisheries Section
South Carolina Department of Resources
Post Office Box 167
Columbia, South Carolina 29202
803-734-3808
selfr@dnr.sc.gov

Ryan Heise, Nongame Section
North Carolina Wildlife Resources Commission
1142 I-85 Service Road
Creedmore, North Carolina 27522
919-528-9886
ryan.heise@ncwildlife.org

Jaci Zelko
U.S. Fish & Wildlife Service
5308 Spring Street
Warm Springs, Georgia 31830
706-655-3382 x 243
Jaclyn_Zelko@fws.gov

Table 3.0-1 VEGP Site Characteristics, AP1000 Design Parameters and Site Interface Values

Part I Site Characteristic			
Item	**Value**		**Description and Reference**
Airborne Effluent Release Point			
Minimum Distance to EAB	½ mi (~800 m)		The lateral distance from the release point (power block area) to the modeled EAB for dose analysis. Refer to Section 2.7.6, Table 2.7-14
Atmospheric Dispersion (χ/Q) (Accident)	*The atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases. Values used in analyses presented in Section 7.1*		
	Time (hour)	Site χ/Q	Atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases.
EAB (χ/Q)	0 - 2	6.62E-5 sec/m^3	
LPZ (χ/Q)	0 - 8 8 - 24 24 - 96 96 - 720	1.25E-5 sec/m^3 1.10E-5 sec/m^3 8.40E-6 sec/m^3 5.75E-6 sec/m^3	Refer to Section 2.7.5, Tables 2.7-12 and 2.7-13, Section 7.1 and Table 7.1-2
Gaseous Effluents Dispersion, Deposition (Annual Average)			
Atmospheric Dispersion (χ/Q)	χ/Q values in Table 2.7-15		The atmospheric dispersion coefficients used to estimate dose consequences of normal airborne releases. Refer to Section 2.7.6, Table 2.7-15
Population Density			
Population density over the lifetime of the new units until 2090	Population density meets the guidance of RS-002, Attachment 3		Refer to Section 2.5.1, Figures 2.5.1-1 and 2.5.1-2, Table 2.5.1-1
Exclusion Area Boundary (EAB)	The EAB is as defined on Drawing No. AR01-0000-X2-2002 Refer to Figure 3.1-3		The exclusion area boundary generally follows the plant property line and is defined on Drawing No. AR01-0000-X2-2002. Refer to Section 2.7.5
Low Population Zone (LPZ)	A 2-mile-radius circle from the midpoint between the containment buildings of Units 1 and 2		The LPZ is a 2-mile-radius circle from the midpoint between Unit 1 and Unit 2 containment buildings. Refer to Section 2.7.5

Table 4.6-1 Summary of Measures and Controls to Limit Adverse Impacts During Construction

	Potential Impact Significance[1,2]															
Section Reference	Noise	Erosion and Sediment	Air Quality	Traffic	Wastes	Surface Water	Groundwater	Land Use	Water Use	Terrestrial Ecosystems	Aquatic Ecosystems	Socioeconomic	Radiation Exposure	Other (site-specific)	Impact Description or Activity	Specific Measures and Controls
4.1 Land-Use Impacts																
4.1.1 The Site and Vicinity		S				S		S							• Ground disturbing activities including grading and recontouring • Removal of existing vegetation. • Stockpiling of soils onsite • Construction of new buildings and impervious surfaces	• Conduct ground disturbing activities in accordance with regulatory and permit requirements. Use adequate erosion controls and stabilization measures to minimize impacts. • Limit vegetation removal to the area within the VEGP site designated for construction activities • Minimize potential impacts to wetlands through avoidance and compliance with applicable permitting requirements • Restrict soil stockpiling and reuse to designated areas on the VEGP site • Restrict construction activities to the ESP site
4.1.2 Transmission Corridors and Offsite Areas		S				S		S							• Construction of transmission line in a new corridor	• Site new corridor to avoid critical or sensitive habitats/species as much as possible • Limit vegetation removal and construction activities to corridor, and to fall and winter to avoid nesting activities • Restrict sites of access to corridor for construction equipment • Minimize potential impacts through avoidance and compliance with permitting requirements and best management practices

Table 5.10-1 Summary of Impacts and Measures and Controls to Limit Adverse Impacts During Operations

Section Reference	Noise	Erosion and Sediment	Air Quality	Traffic/Transportation	Wastes	Surface Water	Groundwater	Land-Use	Water-Use	Terrestrial Ecosystems	Aquatic Ecosystems	Socioeconomic	Radiation Exposure	Public Health & Safety	Other (site-specific)	Impact Description or Activity	Feasible and Adequate Measures/Controls
	Potential Impact Significance[1,2]																
5.1 Land-Use Impacts																	
5.1.1 The Site and Vicinity								S-M				S				• Although Burke County does not have zoning designations, the land use as VEGP will not change from current land use • Some of the workforce may chose to live in the immediate vicinity of the project • Property taxes on new units could provide county with revenues to develop additional land in the county	• No mitigation measures will be required

3.9 Pre-Construction and Construction Activities

Section 3.9 describes activities that form the basis for SNC analyses in Chapter 4, Environmental Impacts of Construction. Section 3.9 provides separate discussions of pre-construction activities and construction activities because these activities take place at different times, are authorized under separate NRC regulatory provisions, and can have environmental impacts that differ in magnitude and duration. Basically, pre-construction activities are not nuclear safety related whereas construction activities are. Section 1.3 discusses the relationship between these activities and the various NRC and other regulatory agency reviews, approvals, and consultations.

An ESP does not constitute a decision or approval to construct a new unit and SNC has not committed to any start date for construction. Pre-construction activities could start as early as ESP issuance and as late as 20 years from ESP issuance. With SNC ESP application submittal in 2006 and a 3-year NRC approval schedule, this would give a pre-construction start schedule ranging from 2009 to 2029. SNC estimates that it could start these same pre-construction activities 6 months before ESP issuance if it applied for, and NRC issued, an optional Limited Work Authorization (LWA) 1 (see Section 1.3). In order to ensure analysis that envelopes the full range of schedule possibilities, and to preserve its option of applying for an LWA-1, SNC has prepared its environmental report assuming an LWA-1 and 18-month pre-construction activity that could start as early as 2009 and as late as 2029.

Construction activities, which are nuclear safety related, are very unit-specific and SNC intends to have separate Unit 3 and Unit 4 construction schedules. Pre-construction activities tend to be less unit specific and more project- and site-wide in nature. For this reason, SNC is using a common pre-construction schedule for the two units.

As discussed in Section 1.3, SNC intends to pursue obtaining a COL and has the option of submitting a COL application prior to NRC issuance of the ESP. Construction could start as early as COL issuance. Assuming COL submittal in 2008 and a 3-year NRC approval schedule, this would give a construction start schedule of 2011. SNC estimates that it could start some nuclear safety related construction 6 months before COL issuance if SNC secured an optional LWA-2 (see Section 1.3). While SNC currently has no plans to do so, SNC is preserving its option by preparing its environmental report assuming an LWA-2 and a start of construction as early as 2010 and as late as 2032. Earliest start of commercial operation would be 2015 for Unit 3 and 2016 for Unit 4; latest would be 2037 and 2036, respectively.

SNC has analyzed the range of ESP and COL dates to ensure that the environmental report reasonably bounds potential impacts.

Chapter 8 Need for Power

Chapter 8 presents the need for power evaluation based on Georgia Power Company's Integrated Resource Plan (IRP). As discussed in Chapter 1 Georgia Power Company (GPC), through the Georgia Public Service Commission's Integrated Resource Planning process, has identified that an economic need for additional base load generation is identified no later than June 2015. The addition of new baseload generation at VEGP will represent the first addition in baseload generation since 1989. GPC is a regulated utility and must satisfy the State of Georgia's detailed review considering future power needs and also must seek state approval to pursue new nuclear generation at the VEGP site. The State of Georgia retains approval authority over the types of electric generation that will be constructed and operated within its border. NUREG-1555 proposes that a state-approved IRP can support the NRC need for power evaluation if it is (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. It is SNC's determination that the GPC IRP satisfies these criteria and therefore no additional independent review by the NRC is required. The following sections discuss how the IRP process satisfies the need for power analysis.

- SNC Approach (Section 8.1)
- Integrated Resource Planning in Georgia (Section 8.2)
- Georgia Power Integrated Resource Plan (Section 8.3)
- Other Planning (Section 8.4)
- Conclusion (Section 8.5)

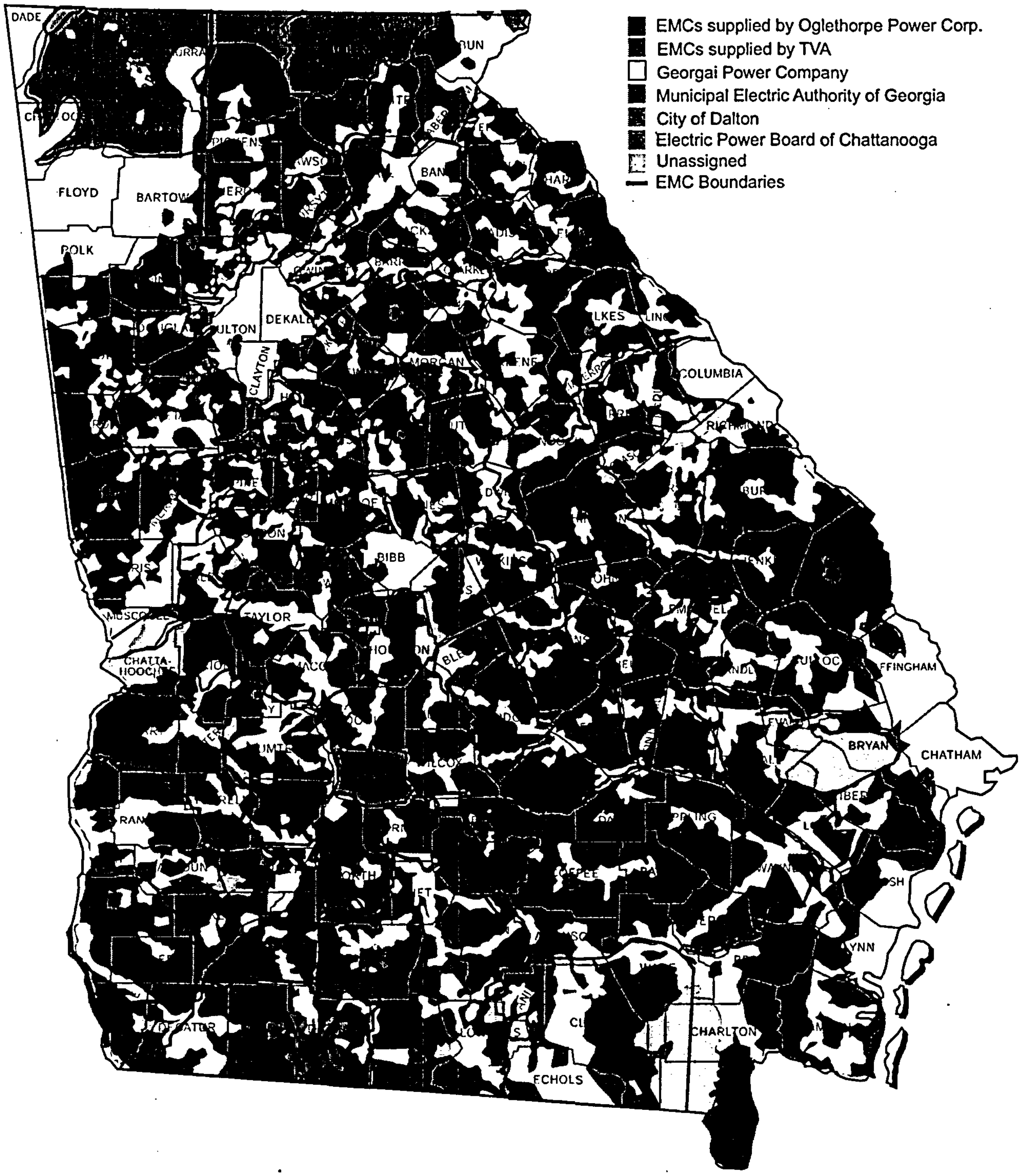
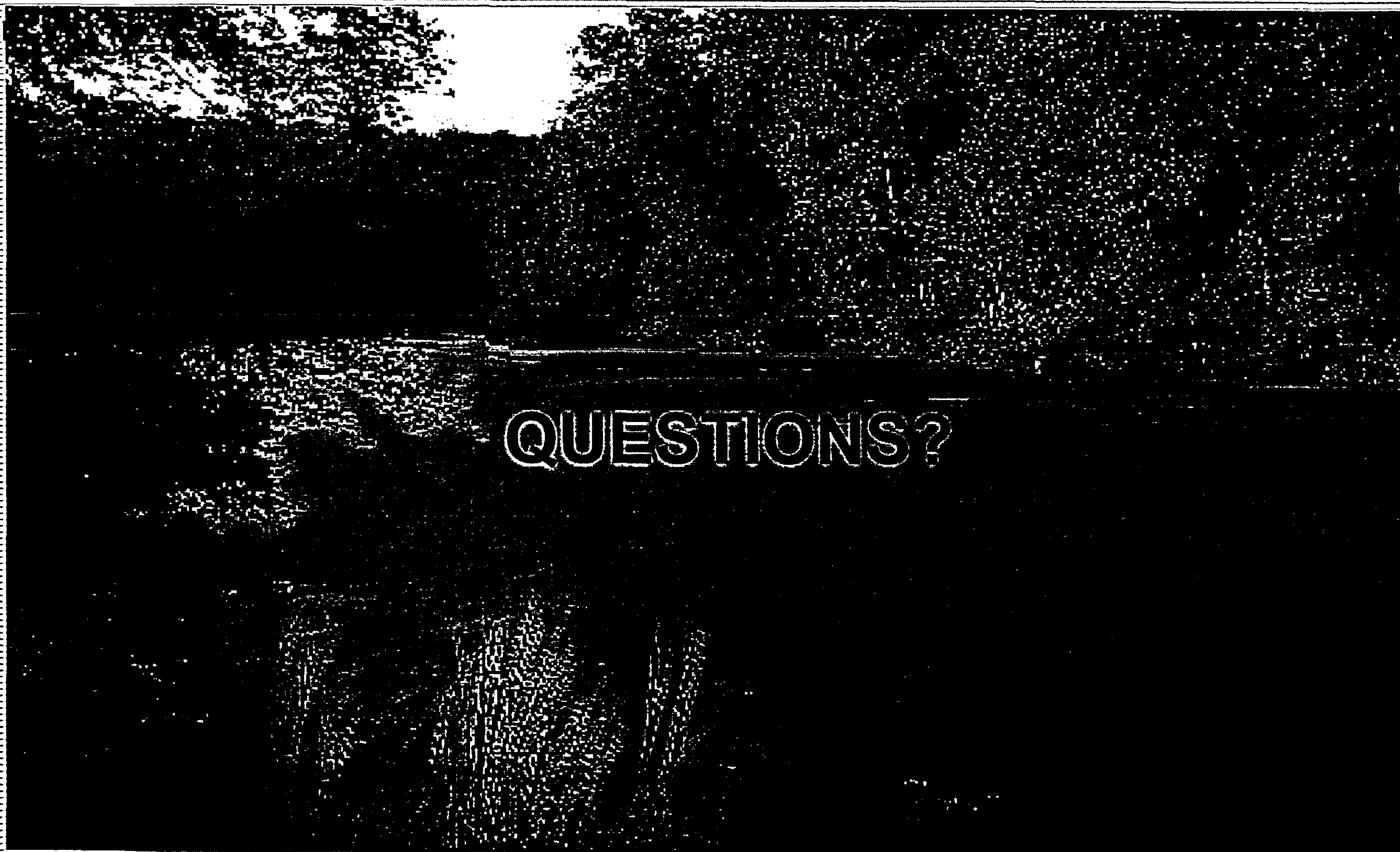


Figure 8.1-1 Georgia Electric Suppliers Assigned Service Areas

Vogtle Early Site Permit



Mallard Pond

Emergency Plan

SOUTHERN COMPANY
Energy to Serve Your World™

- Based on existing Vogtle emergency plan
  - 16 sections patterned after 10CFR 50.47(b)
  - Base plan and two annexes
    - Annex V1 – requirements unique to Vogtle 1 and 2
    - Annex V2 – requirements unique to Vogtle 3 and 4
  - Includes ITAACs

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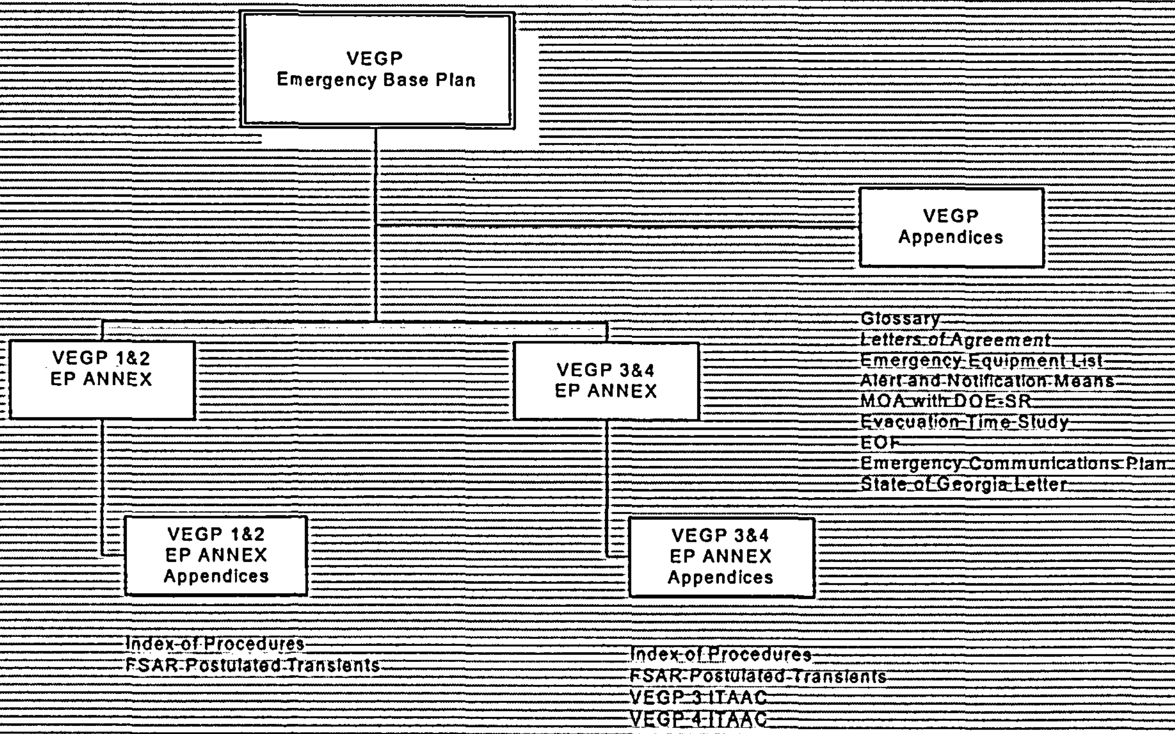
Emergency Plan Structure

Vogtle Site Emergency Plan
Hierarchy



Emergency Plan Unique Features

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Energy to Serve Your World™

- Proximity to Savannah River Site (SRS)
  - SRS responsible for emergency planning and response for portion of 10 mile EPZ
- Staffing Table B1
- EALs based on NEI 99-01
- Proposed common TSC for the Site
- Uses existing SNC EOF
- New evacuation time estimate study
- ITAACs

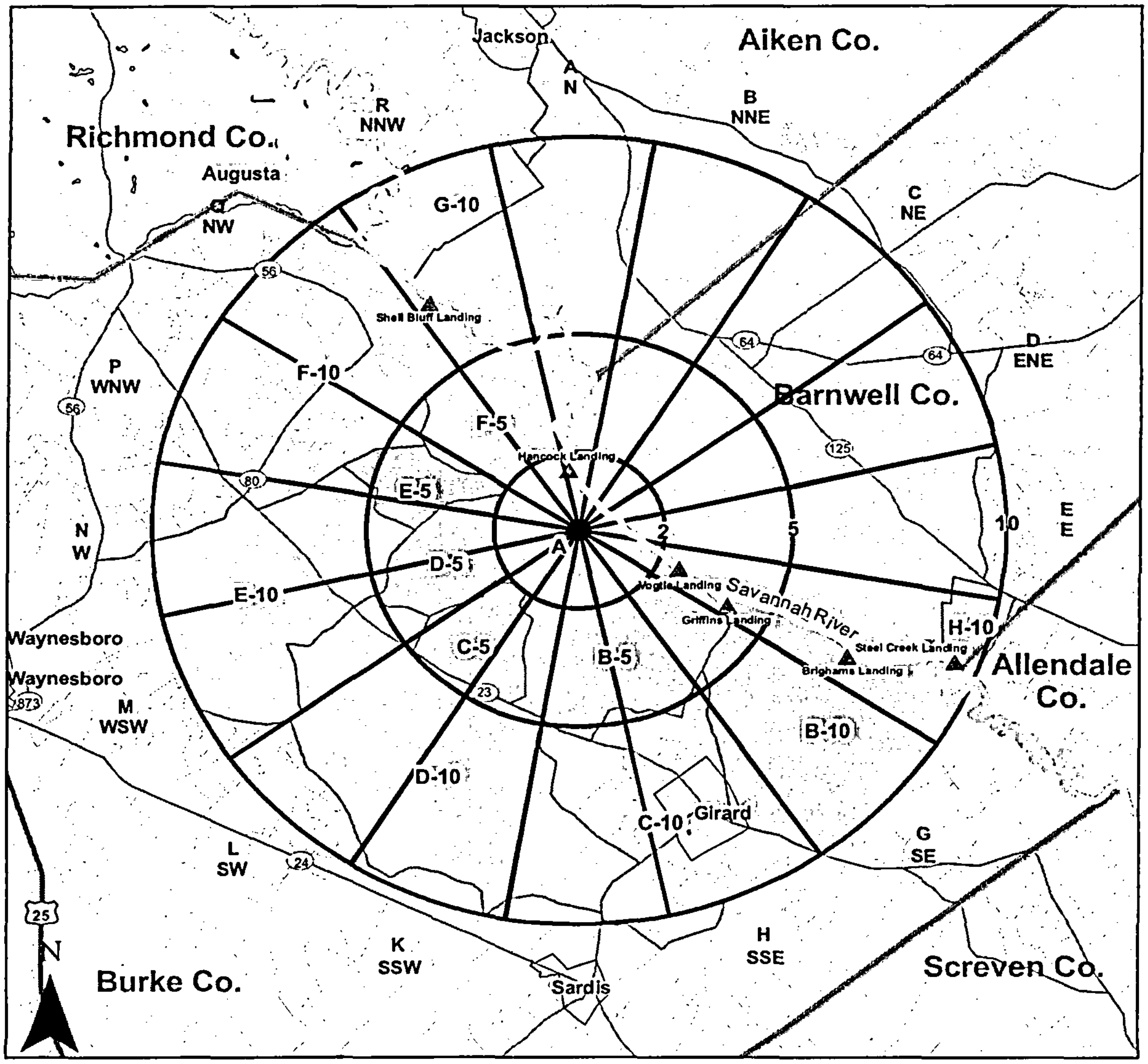
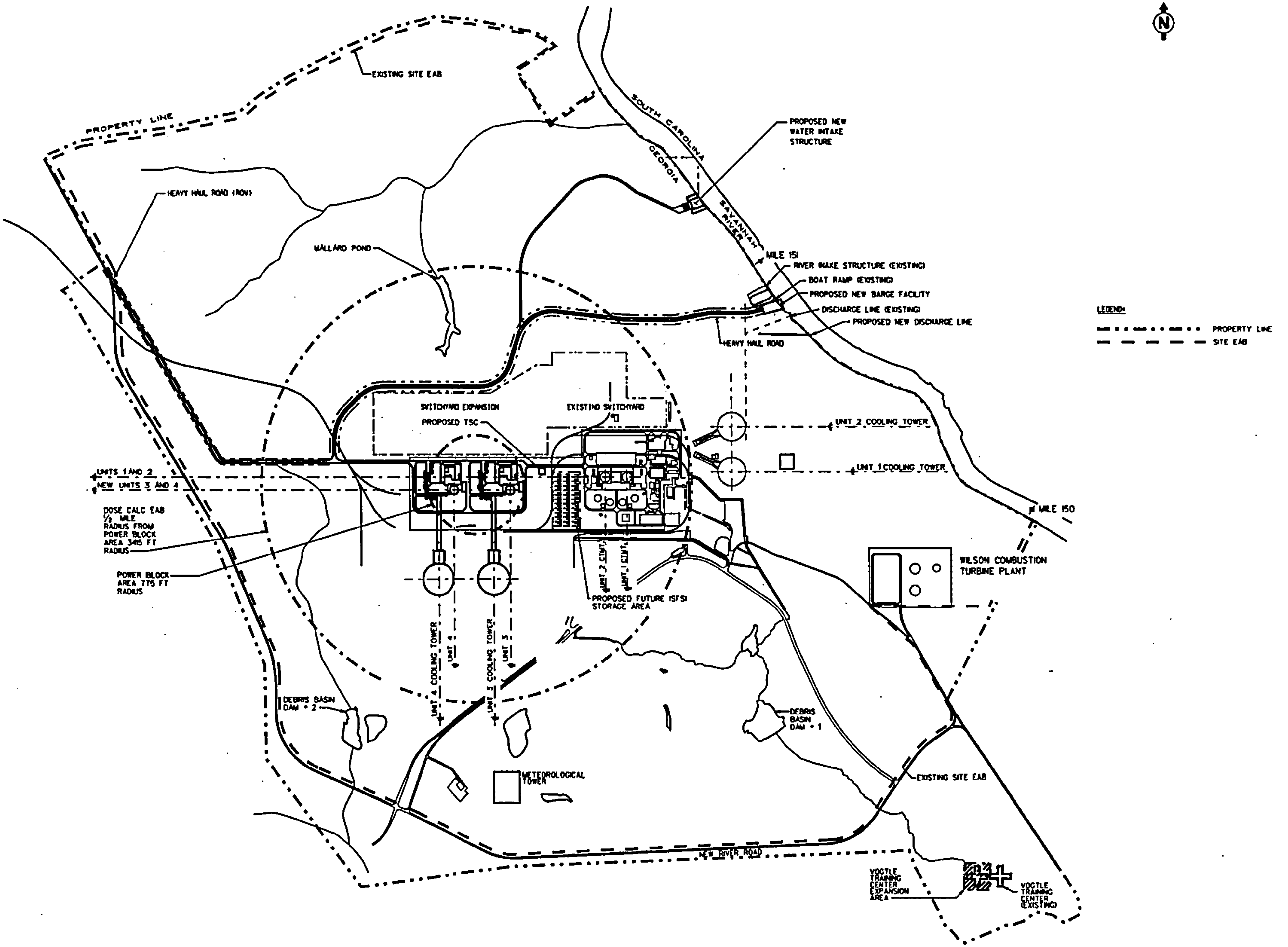


Figure iii VEGP 10-Mile EPZ

Table B-1 *Minimum Staffing for Power Operation*

Major Functional Area	Major Tasks	Position Title or Expertise	Unit 1/2 On Shift	Unit 3 On Shift	Unit 3/4 On Shift	Site On Shift	Augmentation in 75 Minutes
Plant operation and assessment of operational aspects		Shift Manager (SRO) Shift Supervisor (SRO) Plant Operator (RO) System Operator	 2 (a) (b) 3 (a) 3 (a)(c)	 2 (a) (b) 2 (a) 2 (a) (c)	 3 (a) (b) 4 (a) 4 (a) (c)	1 (a)	
Emergency direction and control (Emergency Director)	Overall management of emergency organization	Shift Supervisor; Shift Manager				1 (a) (d)	1
Notification/communication	Notification of Site, State, local, and Federal personnel	Shift Administrative Assistant or other trained personnel	2	1	2		2
Radiological accident assessment and support of operational accident assessment	EOF direction Offsite dose assessment	Corporate Management HP/Chemistry Shared Foreman	1	1	1		
	Offsite surveys onsite (out of plant)	Chemistry Technicians and other trained personnel				3	3

[a] Refer to technical specifications for non-power operation
[b] One SRO position may be filled by the duty Shift Manager if the Shift Manager holds a SRO on the applicable unit
[c] One of the System Operators may be assigned to the Fire Brigade
[d] May be provided by shift personnel assigned other functions



N
EXISTING SITE EAB
PROPERTY LINE
SOUTH CAROLINA
GEORGIA
SAVANNAH RIVER
PROPOSED NEW WATER INTAKE STRUCTURE
HEAVY HAUL ROAD (ROV)
MALLARD POND
MILE 151
RIVER INTAKE STRUCTURE (EXISTING)
BOAT RAMP (EXISTING)
PROPOSED NEW BARGE FACILITY
DISCHARGE LINE (EXISTING)
PROPOSED NEW DISCHARGE LINE
HEAVY HAUL ROAD
LEGEND:
PROPERTY LINE
SITE EAB
SWITCHYARD EXPANSION
EXISTING SWITCHYARD
PROPOSED TSC
UNIT 2 COOLING TOWER
UNIT 1 COOLING TOWER
UNITS 1 AND 2
NEW UNITS 3 AND 4
DOSE CALC EAB 1/2 MILE RADIUS FROM POWER BLOCK AREA 3415 FT RADIUS
POWER BLOCK AREA 775 FT RADIUS
UNIT 2 CTMT.
UNIT 1 CTMT.
PROPOSED FUTURE ISFSI STORAGE AREA
MILE 150
WILSON COMBUSTION TURBINE PLANT
UNIT 4 COOLING TOWER
UNIT 4
UNIT 3 COOLING TOWER
UNIT 3
DEBRIS BASIN DAM # 2
DEBRIS BASIN DAM # 1
METEOROLOGICAL TOWER
EXISTING SITE EAB
NEW RIVER ROAD
VOGTLE TRAINING CENTER EXPANSION AREA
VOGTLE TRAINING CENTER (EXISTING)

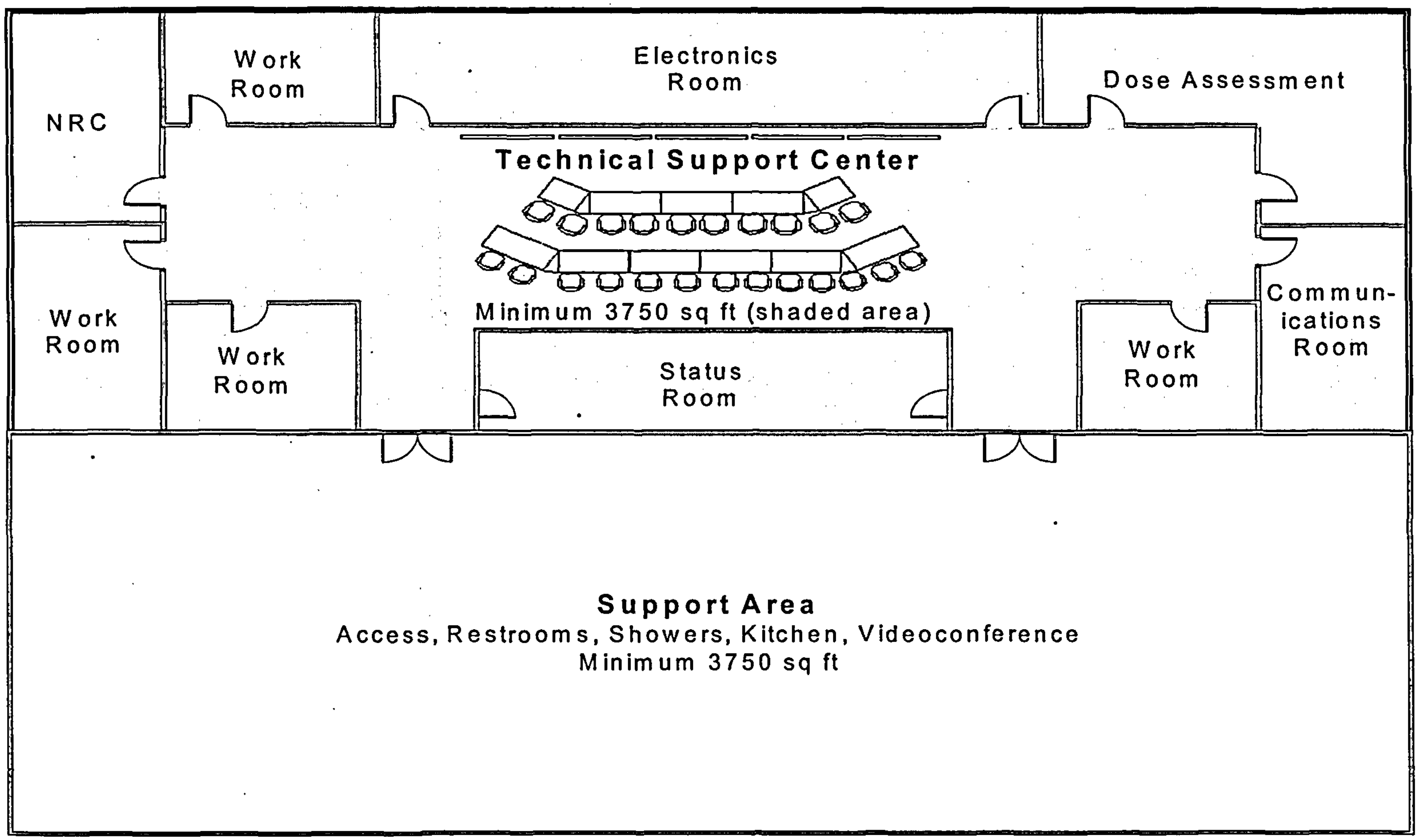


Figure H-1 ***VEGP TSC Layout***

ITAACs

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Energy to Serve Your World™

- Based on DG-1145
- Separate set of ITAACs for Unit 3 and Unit 4
  - Fewer ITAACs for Unit 4 (verified during Unit 3 ITAACs)
- Key ITAACS
  - EALs
  - TSC and OSC verification
  - Completion of exercise
  - Submittal of implementing procedures

V2 Appendix 3 Unit 3 ITAAC

Table V2A3-1 *Unit 3 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)*

Planning Standard	EP Program Elements (From NUREG 0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 An emergency classification and emergency action level scheme must be established by the licensee. The specific instruments, parameters or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class. [D.1]	1.1 An inspection of the control room, technical support center (TSC), and emergency operations facility (EOF) will be performed to verify that they have displays for retrieving system and effluent parameters specified in Table Annex V2 D.2-1, *Hot Initiating Condition Matrix, Modes 1,2,3, and 4,* Table V2 D.2-2, *Cold Initiating Condition Matrix, Modes 5,6, and De-fueled*, and EIPs (Emergency Implementing Procedures).	1.1 The parameters specified in Table Annex V2 H-1, *Post Accident Monitoring Variables,* are retrievable in the control room, TSC, and EOF. The ranges encompass the values specified in the emergency classification and EAL scheme
3.0 Emergency Communications			
10 CFR 50.47(b)(6) Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exists for communications between the control room, OSC, TSC, EOF, principal State and local emergency operations centers (EOCs), and radiological field monitoring teams. [F.1.d]	3.1 & 3.2 A test will be performed of the capabilities	3.1 Communications are established between the control room, OSC, TSC, and EOF. Communications are established between the TSC and Georgia Emergency Management Agency (GEMA) Operation Center; Burke County Emergency Operations Center (EOC); SRS Operations Center; South Carolina Warning Point; and Aiken, Allendale, and Barnwell County Dispatchers. Communications are established between the TSC and radiological monitoring teams.