

Southern Nuclear Operating Company
Vogtle Electric Generating Plant, Units 3 & 4
COL Application

COLA Table of Contents

Part 1 — General and Financial Information

Part 2 — Final Safety Analysis Report

Part 3 — Applicant's Environmental Report - Combined License Stage

Part 4 — Technical Specifications

Part 5 — Emergency Plan

Part 6 — LWA Request

Part 7 — Departures, Exemptions, and Variances

Part 8 — Safeguards/Security Plans

Part 9 — Withheld Information

Part 10 — Proposed License Conditions (Including ITAAC)

Part 11 — Enclosures

Vogtle Early Site Permit Application

Overall Table of Contents

Vogtle Electric Generating Plant, Units 3 & 4

COL Application

Part 3

**Applicant's Environmental Report — Combined License
Stage**

Revision 1

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

TABLE OF CONTENTS

| <u>Section</u> | <u>Title</u> | <u>Page</u> |
|----------------|---|-------------|
| 1.0 | Introduction | 1-1 |
| 1.1 | Background..... | 1-1 |
| 1.1.1 | Site Preparation and Preliminary Construction Activities | 1-1 |
| 1.1.2 | COL Application and Review..... | 1-2 |
| 1.2 | Proposed Federal Action | 1-2 |
| 1.3 | The Purpose and Need for the Proposed Action | 1-2 |
| 1.4 | Alternatives to the Proposed Action..... | 1-3 |
| 1.5 | Compliance and Consultations | 1-3 |
| 1.5.1 | Status of Regulatory Agency Consultations..... | 1-22 |
| 1.5.2 | Conformance with Division 4 Regulatory Guides..... | 1-22 |
| 1.6 | Report Contents..... | 1-22 |
| 1.7 | Environmental Report Methodology..... | 1-22 |
| 1.7.1 | Demonstration that ER Conforms with Regulatory Requirements | 1-22 |
| 1.7.2 | New and Significant Review..... | 1-24 |
| 1.8 | References..... | 1-26 |
| 2.0 | Affected Environment..... | 2-1 |
| 2.1 | Site Location | 2-1 |
| 2.2 | Land | 2-1 |
| 2.3 | Meteorology and Air Quality..... | 2-1 |
| 2.4 | Geology..... | 2-1 |
| 2.5 | Radiological Environment | 2-1 |
| 2.6 | Water | 2-2 |
| 2.7 | Ecology | 2-2 |
| 2.8 | Socioeconomics..... | 2-2 |
| 2.9 | Historic and Cultural Resources | 2-2 |
| 2.10 | Environmental Justice..... | 2-2 |
| 2.11 | Related Federal Projects and Consultation | 2-2 |
| 3.0 | Site Layout and Plant Description | 3-1 |
| 3.1 | External Appearance and Layout..... | 3-14 |
| 3.2 | Plant Description..... | 3-14 |
| 3.2.1 | Plant Water Use | 3-14 |
| 3.2.2 | Cooling System | 3-17 |
| 3.2.3 | Radioactive Waste Management System | 3-17 |
| 3.2.4 | Nonradioactive Waste Systems | 3-17 |
| 3.3 | Power Transmission System | 3-17 |
| 3.4 | References..... | 3-18 |
| 4.0 | Construction Impacts at the Proposed Site..... | 4-1 |
| 4.1 | Land-Use Impacts..... | 4-1 |
| 4.2 | Meteorological and Air-Quality Impacts | 4-1 |
| 4.3 | Water-Related Impacts | 4-1 |
| 4.4 | Ecological Impacts | 4-1 |
| 4.5 | Socioeconomic Impacts | 4-2 |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

TABLE OF CONTENTS (continued)

| <u>Section</u> | <u>Title</u> | <u>Page</u> |
|----------------|---|-------------|
| 4.6 | Historic and Cultural Resource Impacts..... | 4-2 |
| 4.7 | Environmental Justice Impacts | 4-2 |
| 4.8 | Non-Radiological Health Impacts..... | 4-2 |
| 4.9 | Radiological Health Impacts | 4-2 |
| 4.10 | Measures and Controls to Limit Adverse Impacts During Site Preparation Activities and Construction | 4-3 |
| 4.11 | Site Redress Plan | 4-3 |
| 4.12 | Summary of Construction Impacts..... | 4-3 |
| 4.13 | References..... | 4-3 |
| 5.0 | Station Operational Impacts at the Proposed Site | 5-1 |
| 5.1 | Land-Use Impacts..... | 5-1 |
| 5.2 | Meteorological and Air-Quality Impacts | 5-1 |
| 5.3 | Water-Related Impacts | 5-1 |
| 5.4 | Ecological Impacts..... | 5-1 |
| 5.5 | Socioeconomic Impacts | 5-2 |
| 5.6 | Historic and Cultural Resource Impacts..... | 5-2 |
| 5.7 | Environmental Justice Impacts | 5-2 |
| 5.8 | Non-Radiological Health Impacts..... | 5-2 |
| 5.9 | Radiological Impacts of Normal Operations..... | 5-2 |
| 5.10 | Environmental Impacts of Postulated Accidents..... | 5-3 |
| 5.11 | Measures and Controls to Limit Adverse Impacts During Operation | 5-6 |
| 5.12 | Summary of Operational Impacts | 5-6 |
| 6.0 | Fuel Cycle, Transportation, and Decommissioning | 6-1 |
| 6.1 | Fuel Cycle Impacts and Solid Waste Management | 6-1 |
| 6.2 | Transportation Impacts | 6-1 |
| 6.3 | Decommissioning..... | 6-1 |
| 7.0 | Cumulative Impacts | 7-1 |
| 7.1 | Land Use..... | 7-1 |
| 7.2 | Air Quality | 7-1 |
| 7.3 | Water Use and Quality..... | 7-1 |
| 7.4 | Terrestrial Ecosystem | 7-1 |
| 7.5 | Aquatic Ecosystem | 7-2 |
| 7.6 | Socioeconomics, Historic and Cultural Resources, Environmental Justice | 7-2 |
| 7.7 | Non-radiological Health..... | 7-2 |
| 7.8 | Radiological Impacts of Normal Operations..... | 7-3 |
| 7.9 | Severe Accidents | 7-3 |
| 7.10 | Fuel Cycle, Transportation, Decommissioning | 7-3 |
| 7.11 | NRC Staff Conclusions and Recommendations | 7-3 |
| 8.0 | Need for Power | 8-1 |
| 8.1 | Description of Power System..... | 8-1 |
| 8.2 | Power Demand / Integrated Resource Planning..... | 8-1 |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

TABLE OF CONTENTS (continued)

| <u>Section</u> | <u>Title</u> | <u>Page</u> |
|----------------|---|-------------|
| 8.3 | Power Supply / Integrated Resource Planning in the State of Georgia | 8-1 |
| 8.4 | Assessment of Need for Power / NRC Findings on GPC’s IRP..... | 8-1 |
| 8.5 | References..... | 8-2 |
| 9.0 | Environmental Impacts of Alternatives..... | 9-1 |
| 9.1 | No-Action Alternative | 9-1 |
| 9.2 | Energy Alternatives..... | 9-1 |
| 9.3 | System Design Alternatives | 9-1 |
| 9.4 | Region of Interest and Alternative Site Selection Process..... | 9-1 |
| 9.5 | Evaluation of Alternative Sites | 9-1 |
| 9.6 | Issues Among Sites Handled Generically..... | 9-2 |
| 9.7 | Summary of Alternative Site Impacts..... | 9-2 |
| 9.8 | References..... | 9-2 |
| 10.0 | Comparison of Impacts of the Proposed Action and the Alternative Sites..... | 10-1 |
| 10.1 | Comparison of the Proposed Site with the Alternative Sites..... | 10-1 |
| 10.2 | Environmentally Preferable Sites..... | 10-1 |
| 10.3 | Obviously Superior Sites..... | 10-1 |
| 10.4 | Comparison with the No-Action Alternative | 10-1 |
| 11.0 | Conclusions and Recommendations | 11-1 |
| 11.1 | Impacts of the Proposed Action | 11-1 |
| 11.2 | Unavoidable Adverse Environmental Impacts | 11-1 |
| 11.3 | Alternatives to the Proposed Action | 11-2 |
| 11.4 | Relationship Between Short-Term Uses and Long-Term Productivity of the Human Environment | 11-2 |
| 11.5 | Irreversible and Irrecoverable Commitments of Resources | 11-2 |
| 11.6 | Benefit-Cost Balance | 11-2 |
| 11.7 | NRC Staff Summary and Conclusions | 11-2 |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

LIST OF TABLES

| <u>Table</u> | <u>Title</u> | <u>Page</u> |
|--------------|---|-------------|
| ACRONYMS | | 1-vi |
| Table 1.5-1 | Authorizations Required for Early Site Permit | 1-4 |
| Table 1.5-2 | Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization | 1-8 |
| Table 1.5-3 | Authorizations Required for Redress Activities | 1-13 |
| Table 1.5-4 | Authorizations Required for Construction Activities | 1-16 |
| Table 1.5-5 | Authorizations Required for Operation | 1-20 |
| Table 1.7-1 | 10 CFR 51.50(c)(1) Requirements and EIS Table J-1 Commitments | 1-23 |
| Table 3.0-1 | VEGP Site Characteristics, AP1000 Design Parameters, and Site Interface Values | 3-2 |
| Table 3.0-2 | XOQDOQ-Predicted Maximum X/Q and D/Q Values at Receptors of Interest | 3-13 |
| Table 3.2-1 | Revised Cooling Water System Estimates for Two Units | 3-14 |
| Table 3.2-2 | Revised Plant Groundwater Estimates and Plant Effluent Streams for Two Units | 3-15 |
| Table 5.10-1 | Doses from Design-Basis Accidents Using Updated Information from DCD Rev. 17 | 5-4 |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

LIST OF FIGURES

| <u>Figure</u> | <u>Title</u> | <u>Page</u> |
|---------------|---------------------------------|-------------|
| Figure 3.1-1 | Revised Site Plan | 3-19 |
| Figure 3.2-1 | Revised Intake Dimensions | 3-20 |
| Figure 3.2-2 | Revised Intake Elevation | 3-21 |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

ACRONYMS

| ACRONYM | DEFINITION |
|----------------|--|
| ASLB | Atomic Safety and Licensing Board |
| Btu or BTU | British thermal units |
| CAA | [Federal] Clean Air Act |
| CCW | Component Cooling Water |
| CFR | Code of Federal Regulations |
| COL | Combined Operating License |
| COLA | Construction and Operating License Application |
| CWA | [Federal] Clean Water Act |
| DCD | Design Control Document |
| EAB | Exclusion Area Boundary |
| EIS | Environmental Impact Statement |
| EPD | [Georgia] Environmental Protection Division |
| EPM | Environmental Project Manager |
| ER | Environmental Report |
| ESP | Early Site Permit |
| ESPA | Early Site Permit Application |
| FAA | Federal Aviation Administration |
| FR | Federal Register |
| GDNR | Georgia Department of Natural Resources |
| GDOT | Georgia Department of Transportation |
| GPC | Georgia Power Company |
| gpm | gallons per minute |
| GPSC | Georgia Public Service Commission |
| IRP | Integrated Resource Plan |
| LPZ | Low Population Zone |
| LWA | Limited Work Authorization |
| MTU | metric tons uranium |
| MWd | megawatt days |
| NA | not applicable or not available |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

ACRONYMS

| ACRONYM | DEFINITION | |
|----------------|---|--|
| NMFS | National Marine Fisheries Service | |
| NOT | Notice of Termination | |
| NPDES | National Pollutant Discharge Elimination System | |
| NRC | [U.S.] Nuclear Regulatory Commission | |
| NSSS | Nuclear Steam Supply System | |
| O.C.G.A. | Official Code of Georgia Annotated | |
| PSD | Prevention of Significant Deterioration | |
| SHPO | State Historic Preservation Office or Officer | |
| SME | subject matter experts | |
| SNC | Southern Nuclear Operating Company | |
| SWS | Service Water System | |
| USACE | U.S. Army Corps of Engineers | |
| U.S.C. | US Code | |
| USDOT | U.S. Department of Transportation | |
| USFWS | U.S. Fish and Wildlife Service | |
| VEGP | Vogtle Electric Generating Plant | |

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

1.0 INTRODUCTION

In August 2006, Southern Nuclear Operating Company (SNC), Inc. submitted an Early Site permit (ESP) application for two additional units at the Vogtle Electric Generating Plant (VEGP) site. At that time, SNC indicated to the Nuclear Regulatory Commission (NRC) that the ESP Application Environmental Report (ER) was developed with the intent of leaving no items unresolved in the ESP Environmental Impact Statement (EIS), thus supporting finality for environmental issues in the COLA. In August 2008, the NRC issued the final EIS for the Vogtle ESP application. The EIS did not identify any unresolved items. On August 26, 2009, NRC issued an Early Site Permit to SNC for the VEGP site.

1.1 BACKGROUND

Georgia Power Company (GPC), Oglethorpe Power Corporation (an Electric Membership Corporation), the Municipal Electric Authority of Georgia, and the City of Dalton, Georgia, an incorporated municipality in the State of Georgia acting through its Board of Water, Light, and Sinking Fund Commissioners City of Dalton (Dalton Utilities) are co-owners of VEGP Units 1 and 2 in Burke County, Georgia. The nuclear reactors are operated for the co-owners by SNC.

In 2006, SNC submitted an application to the NRC for an ESP for the VEGP site. As part of the process of granting an ESP the NRC must determine if a site is environmentally suitable for the generation of nuclear power, and if a nuclear reactor could be safely sited, constructed, and operated at the selected location. If these determinations are favorable, the ESP allows the company to maintain the option, for up to 20 years, of applying for a Combined Operating License (COL) to construct and operate a nuclear power reactor at the site. In addition, if the applicant can provide adequate information to resolve environmental issues and the NRC concludes in the ESP EIS that no unresolved issues are present, then all issues are considered to have finality and do not require action during the COL Application (COLA) process other than to determine if new and significant information exists that would alter the original NRC conclusion on a specific issue stated in the ESP EIS.

SNC, on behalf of the co-owners, is submitting this application for COLs to construct and operate two Westinghouse AP1000 reactors at the VEGP site. Because the NRC has performed an environmental review to establish VEGP site suitability as part of the ESP process, and the NRC has prepared an EIS documenting their findings and conclusions, SNC has chosen to reference that ESP EIS in this ER. The COLA rule (10 CFR 52) requires the NRC to issue the COL based on the conclusions of the ESP EIS.

1.1.1 SITE PREPARATION AND PRELIMINARY CONSTRUCTION ACTIVITIES

SNC initiated site-preparation activities that do not require a Limited Work Authorization (LWA), as described in Section 4.11 of the EIS, in February 2009. In conjunction with the ESP, NRC issued an LWA authorizing SNC to perform preliminary construction activities as prescribed in 10 CFR 50.10(d)(1). Prior to NRC's decision on a COL, SNC may request additional LWAs.

Part 6 of this application refers to the site redress plan that is a component of the ESP application (**SNC 2008**) and that addresses the measures SNC would take to ensure that, should construction be terminated prior to completion of the plant, LWA activities would be remediated to return the site to an acceptable environmental condition.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

1.1.2 COL APPLICATION AND REVIEW

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.

A COLA can reference an ESP issued under 10 CFR 52 Subpart A, Early Site Permits (51.50(c)(1)). In general, if the COLA references an ESP, the COLA's ER need not contain certain information or analyses previously submitted to the NRC in connection with the ESP Application. Instead, the COLA's ER 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.

A COLA can also reference a standard design certification (51.50(c)(2)). If the COLA references a standard design certification, the ER may incorporate by reference the environmental assessment prepared by the NRC for the referenced design certification, and must demonstrate that the site characteristics for the COL site fall within the parameters in the design certification environmental assessment.

In accordance with NRC regulations, SNC, as agent for the co-owners, submitted an application for an ESP in August 2006. NRC issued the ESP in August 2009. The NRC published an environmental assessment relating to the AP1000 design certification in 2005 (**NRC 2005**).

This COLA incorporates the information presented in both the SNC ESP and the AP1000 design certification, as amended.

1.2 PROPOSED FEDERAL ACTION

The proposed Federal action is the issuance of combined construction and operating licenses for two nuclear units, as described in the design certification for the Westinghouse Electric Company, LLC (Westinghouse) AP1000 advanced light water reactors. The reactors would be sited as described in the ESP application prepared for the VEGP site in Burke County, Georgia.

1.3 THE PURPOSE AND NEED FOR THE PROPOSED ACTION

GPC, through the Georgia Public Service Commission's Integrated Resource Planning (IRP) process, has identified a need for additional base load generation by 2015/2017 (**GPC 2007**). This need was identified through a detailed economic analysis associated with the IRP process.

In addition, the Georgia legislature has pointed out that virtually all new power plants built in Georgia in the last 15 years are fueled by natural gas, exposing electricity consumers to punishing price volatility, and went on to urge Georgia utilities to study the feasibility of building

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

new nuclear power plants (Senate Resolution 865). It is SNC's purpose to be responsive to this resolution.

The new units would be co-located at the site of two nuclear generating facilities owned jointly by GPC, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and Dalton Utilities. SNC has been authorized by GPC, acting as agent for the owners of VEGP, to apply for COLs for the VEGP Units 3 and 4.

SNC is submitting the COLA to the NRC for the authority to construct new nuclear generation to meet GPC needs and the projected needs of the co-owners.

1.4 ALTERNATIVES TO THE PROPOSED ACTION

For the purposes of this COLA, the only relevant alternative to the NRC granting the COLs is the no-action alternative of the NRC not granting the COLs. In this scenario, the construction and operation of two additional nuclear units would not occur. The environmental impacts of operating the nuclear units described in Chapter 5 of the EIS would not occur. Some impacts from preliminary site-preparation activities and activities authorized under the LWA may occur.

The no-action alternative would result in none of the benefits ascribed to the COLs:

- Meeting future energy needs identified by the co-owners.
- Maintaining long-term price stability for electricity in the relevant service area.
- Enhancing energy security and fuel diversity.

1.5 COMPLIANCE AND CONSULTATIONS

As part of its ER preparation process, SNC contacted relevant federal, state, and local agency personnel to confirm that no significant changes in laws or regulations had occurred that could materially affect the conclusions in the ESP EIS and thus require action in the COLA. No such information was identified.

SNC has completed all communications required for the EIS process and no unresolved issues remain.

SNC has initiated discussions with Federal and state regulatory authorities regarding authorizations and permits needed for the construction and operation of the VEGP Units 3 and 4.

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-1 Authorizations Required for Early Site Permit

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|---|---|------------------------|--------------------|--|---|
| U.S.Fish and Wildlife Service (USFWS) | Endangered Species Act | Consultation regarding potential to adversely impact protected species (non-marine species) | NA | NA | Concurrence with no adverse impact or consultation on appropriate mitigation measures. | On Oct 12, 2006, the NRC wrote the USFWS describing the project and asking for a list of protected species and habitats at the proposed site and alternative sites, and for any information under the jurisdiction of the USFWS that the agency considered pertinent to the project. |
| National Marine Fisheries Service (NMFS) | Endangered Species Act | Consultation regarding potential to adversely impact protected species (marine species) | NA | NA | Concurrence with no adverse impact or consultation on appropriate mitigation measures. | On Oct 12, 2006, the NRC wrote the NMFS describing the project and asking for a list of protected species and habitats at the proposed site and alternative sites, and for any information under the jurisdiction of the NMFS that the agency considered pertinent to the project. NMFS responded on Oct 24, 2006 with a list of federally protected species under the jurisdiction of NMFS in Georgia and Alabama. |
| South Carolina Department of Archives and History | National Historic Preservation Act (36 CFR 800) | Consultation regarding potential to adversely affect historic resources | NA | NA | Confirm site construction or operation would not affect protected historic resources. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-1 Authorizations Required for Early Site Permit (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--|--|---|------------------------|--------------------|---|---|
| Alabama Historical Commission | National Historic Preservation Act (36 CFR 800) | Consultation regarding potential to adversely affect historic resources | NA | NA | Confirm site construction or operation would not affect protected historic resources. | On Oct 12, 2006, the NRC wrote the Alabama Historical Commission describing the project and inviting the SHPO to consult with the NRC regarding the proposed project. The SHPO responded without comment on Oct 20, 2006. |
| Georgia Department of Natural Resources (GDNR) | National Historic Preservation Act (36 CFR 800) | Consultation regarding potential to adversely affect historic resources | NA | NA | Confirm site construction or operation would not affect protected historic resources. | On Oct 12, 2006, the NRC wrote the Georgia SHPO describing the project and inviting the SHPO to consult with the NRC regarding the proposed project. The Georgia SHPO responded on Dec 27, 2007 and provided their assessment of the eligibility of sites at VEGP and suggested measures to protect eligible sites during construction and after. |
| GDNR | Federal Clean Water Act (33 U.S.C. 1251 et seq.) (CWA) | Section 401 Certification | NA | NA | Compliance with water quality standards. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-1 Authorizations Required for Early Site Permit (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|---|--|------------------------|--------------------|--|---|
| Native American Nations: | Environmental Protection | Consultation regarding protection of traditional | NA | NA | Confirm that traditional Native American religious or cultural resources are protected | On Oct 12, 2006 and Oct 16, 2006 the NRC wrote the listed Native American groups describing the project and inviting them to consult with the NRC regarding the proposed project. |
| Cherokee Nation of Oklahoma | Regulations for Domestic Licensing and Related Regulatory Functions (10 CFR 51) require | Native American religious or cultural resources | | | | |
| Chickasaw Nation | Protection of Historic Properties (36 CFR 800) | | | | | The Miccosukee Tribe responded on Oct 16, 2006 that it limited itself to matters within the State of Florida. |
| Chickasaw Nation of Oklahoma | | | | | | |
| Georgia Tribe of Eastern Cherokee | | | | | | |
| Alabama-Quassarte Tribal Town | | | | | | The United Keetoowah Band of Cherokee Indians in Oklahoma responded on Oct 22, 2006 that it had no objections to the referenced project. |
| Seminole Nation of Oklahoma | | | | | | |
| Eastern Band of Cherokee Indians | | | | | | The Seminole Nation of Oklahoma responded on Oct 13, 2006 that it was not interested in the project. |
| United Keetoowah Band of Cherokee Indians | | | | | | |
| Poarch Band of Creek Indians | | | | | | |
| Coushatta Tribe of Louisiana | | | | | | |
| Absentee-Shawnee Tribe of Oklahoma | | | | | | |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-1 Authorizations Required for Early Site Permit (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|-----------|-------------|------------------------|--------------------|------------------|--------|
| Muscogee (Creek) Nation of Oklahoma | | | | | | |
| Alabama-Coushatta Tribe of Texas | | | | | | |
| Catawba Indian Tribe | | | | | | |
| Seminole Tribe of Florida | | | | | | |
| Mississippi Band of Choctaw Indians | | | | | | |
| Kidegee Tribal Town | | | | | | |
| Miccosukee Tribe of Indians of Florida | | | | | | |
| Thlopthlocco Tibal Town | | | | | | |
| Muscogee (Creek) Nation | | | | | | |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|--------------------------------------|----------------------------------|------------------------|--------------------|--|---|
| U.S. Army Corps of Engineers (USACE) | CWA | Section 404 Permit | | | Disturbance or crossing wetland areas or navigable waters. For site and rail corridor upgrade ¹ . | SNC has completed jurisdictional determinations for all site wetlands with the exception of the required metes and bounds survey. |
| USACE | 33 CFR 323 | Dredge and Fill Discharge Permit | | | Construction/ modification of intake/ discharge to Savannah River. For site and rail corridor upgrade ¹ . | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| USACE | Rivers and Harbors Act | Section 10 Permit | | | Barge slip modification impacts to navigable waters of the U.S. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| U.S. Department of Transportation (USDOT) | 49 CFR 107, Subpart G | Certificate of Registration | 051409 551 044R | 06/30/2010 | Transportation of hazardous materials. | USDOT has provided the certificate. |
| USFWS | Migratory Bird Treaty Act, 50 CFR 21 | Federal Depredation Permit | | | Adverse impacts on protected species and/or their nests. For site and rail corridor upgrade ¹ . | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| Federal Aviation Administration (FAA) | 49 USC 1501 14 CFR 77 | Construction Notice | | | Notice of erection of structures (>200 feet high) potentially impacting air navigation. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--|---|---|------------------------|--------------------|---|--|
| Georgia Public Service Commission (GPSC) | GA Public Utilities Act (O.C.G.A. Section 46-3-1 et seq.), GA Rules and Regulations 515-3-4-.07 | Certificate of Public Convenience and Necessity | | | Present and future public convenience and necessity require the operation of such equipment or facility. | SNC received GPSC approval of the project on March 17, 2009. |
| GDNR | GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391-4-10 | Depredation Permit | | | Adverse impacts on state designated protected species and/or their habitat. For site and rail corridor ¹ . | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | Federal Clean Air Act (CAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1 | Part 70 Air Quality Construction Permit | 1629-033-0039-S-01-0 | | Construction air emission sources. | Shaw was issued its SIP Air Quality permit on June 18, 2009. SNC PSD permit application currently under review by GA EPD. |
| GDNR | CWA, GA Water Quality Control Act | Revision of existing National Pollutant Discharge Elimination System Permit | | | Regulates limits of pollutants in liquid discharge to surface water | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects. | GAR 100003 | 07/31/2013 | Discharge storm water from site during construction | SNC does not expect to have to file for coverage under GAR 100003. No Erosion, Sedimentation and Pollution Control plans have been developed for submittal under GAR 100003. |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|--|---|------------------------|--------------------|---|--|
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects | GAR 100002 | 07/31/2013 | Discharge storm water from linear construction sites (e.g., roadways and rail corridor) | SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100002. |
| GDNR | GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5 | Revision of existing permit to operate a public water system | | | Operate a public, non-transient, non-community water system. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5 | Revision of existing permit to operate a public water system | | | Operate a public, transient, non-community water system. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03 | Modification of Existing Permit to Use Groundwater | 017-0003 | 08/06/2012 | Consumptive use of 100,000 gallons per day or more of groundwater. | Received. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.09 | Permit to Withdraw Groundwater | 017-0006 | 03/13/2012 | Dewater for foundation if needed for more than 60 days. | Received. |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|--|--|------------------------|--------------------|---|--|
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.14 | Certification of Abandoned Wells | | | Abandoned wells have been filled, plugged and sealed. | SNC provided a notification to EPD regarding Well SW-5, one of two wells to be taken out of service, on February 18, 2009. The remaining well, MU-2a, is scheduled to be removed from service in 2012. |
| GDNR | GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7 | Land Disturbing Activity Permit | GAR 100001 | 07/31/2013 | Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor upgrade ¹ . | SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100001. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4-.06 | Permit by Rule - Inert Landfill Permit | | | On-site disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4 | Private Industry Landfill Permit | | | On-site disposal of solid waste consisting of construction and demolition debris. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4 | Solid Waste Handling Permit | | | Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|------------------------------|--|---|------------------------|--------------------|---|---|
| GDNR | Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1 | Revision of existing Title V Operating Permit | | | Operation of air emission sources. | SNC submitted a request for modification to this permit along with the PSD/NSR permit application submitted on May 26, 2009. |
| Burke County Building Office | Burke County Code of Ordinances, Article VII, Sec. 26-331 | Land Disturbing Activity Permit | | | All land disturbing activities within the boundaries of Burke County. | As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Burke County). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002.. |
| Burke County Building Office | Burke County Code of Ordinances, Article VII, Sec. 26-336 | Building Permit | | | Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

¹The VEGP rail spur was recently upgraded, and SNC will verify that additional upgrades are not needed. For completeness, this table assumes upgrades to the rail corridor will be made.

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-3 Authorizations Required for Redress Activities

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|--|---|---------------------------|--------------------|---|---|
| USACE | CWA | Section 404 Permit | | | Disturbance or crossing wetland areas or navigable waters. | If redress activities were required SNC would seek the necessary permits. |
| USDOT | 49 FR 107, Subpart G | Certificate of Registration | | | Transportation of hazardous materials. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | CWA | Section 401 Certification | | | Compliance with water quality standards. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects | | | Discharge storm water from site during construction. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects | | | Discharge storm water linear construction sites (e.g., roadways, transmission lines) during construction. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7 | Land Disturbing Activity Permit | | | Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor. | If redress activities were required SNC would seek the necessary permits. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-3 Authorizations Required for Redress Activities (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|---|---|---------------------------|--------------------|--|---|
| GDNR | CAA, GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1 | Part 70 Air Quality Construction Permit | | | Construction air emission sources. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5 | Notice of Termination (NOT) - Permit to operate a Public Water System | | | Operate a public, non-transient, non-community water system. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5 | NOT - Permit to operate a Public Water System | | | Operate a public, transient, non-community water system. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03 | NOT - Permit to Use Groundwater | | | Consumptive use of 100,000 gallons per day or more of groundwater. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.09 | Permit to Withdraw Groundwater | | | Dewater for foundation if needed for more than 60 days. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.14 | Certification of Abandoned Wells | | | Abandoned wells have been filled, plugged and sealed. | If redress activities were required SNC would seek the necessary permits. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-3 Authorizations Required for Redress Activities (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|------------------------------|--|--|---------------------------|--------------------|---|---|
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4-.06 | Permit by Rule - Inert Landfill Permit | | | On-site disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4 | Private Industry Landfill Permit | | | On-site disposal of solid waste consisting of construction and demolition debris. | If redress activities were required SNC would seek the necessary permits. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4 | Solid Waste Handling Permit | | | Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill. | If redress activities were required SNC would seek the necessary permits. |
| Burke County Building Office | Burke County Code of Ordinances, Article VII, Sec. 26-331 | Land Disturbing Activity Permit | | | All land disturbing activities within the boundaries of Burke County | If redress activities were required SNC would seek the necessary permits. |
| Burke County Building Office | Burke County Code of Ordinances, Article VII, Sec. 26-336 | Building Permit | | | Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County. | If redress activities were required SNC would seek the necessary permits. |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-4 Authorizations Required for Construction Activities¹

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|--|---|--|--------------------|--|---|
| NRC | 10 CFR 52, Subpart C | Combined Operating License | | | Safety-related construction for a nuclear power facility. | |
| | or 10 CFR 50.10(e)(3) | or Limited Work Authorization | LWA is part of permit ESP-004 | 09/26/2029 | | NRC issued LWA on August 26, 2009 as part of ESP-004. |
| FAA | 49 USC 1501 14 CFR 77 | Construction Notice | | | Notice of erection or structures (>200 feet high) potentially impacting air navigation. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| USACE | CWA | Section 404 Permit | | | Disturbance or crossing wetland areas or navigable waters. For transmission line corridor. | SNC has completed jurisdictional determinations for all site wetlands with the exception of the required metes and bounds survey. |
| USACE | 33 CFR 323 | Dredge and Fill Discharge Permit | | | Construction/ modification of intake/ discharge to Savannah River. For transmission line corridor. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| USFWS | Migratory Bird Treaty Act, 50 CFR 21 | Federal Depredation Permit | | | Adverse impacts on protected species and/or their nests. For site transmission line corridor. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-4 Authorizations Required for Construction Activities¹ (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|--------|--|---|---------------------------|--------------------|--|--|
| GDNR | GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391-4-10 | Depredation permit | | | Adverse impacts on state designated protected species and/or their habitat. For transmission line corridor. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | CAA, GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1 | Part 70 Air Quality Construction Permit | 1629-033-0039-S-01-0 | | Construction air emission sources. | Shaw was issued its SIP Air Quality permit on June 18, 2009. SNC PSD permit application currently under review by GA EPD. |
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects | GAR 100002 | 07/31/2013 | Discharge storm water from linear construction sites (e.g., roadways, transmission lines) during construction. | SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100002. |
| GDNR | GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4 | Solid Waste Handling Permit | | | Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-4 Authorizations Required for Construction Activities¹ (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|--|--|---------------------------|--------------------|---|--|
| GDNR | GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7 | Land Disturbing Activity Permit | GAR 100001 | 07/31/2013 | Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For transmission line corridor. | SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100001. |
| GDNR | CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6 | General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects | GAR 100003 | | Discharge storm water from site during construction. | SNC currently does not expect to have to file for coverage under GAR 100003. No Erosion, Sedimentation and Pollution Control plans have been developed for submittal under GAR 100003. |
| Georgia Department of Transportation (GDOT) | 23 CFR 1.23 | Permit | | | Utility right-of-way easement. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| Burke County Building Office | Burke County Code of Ordinances, Article VII, Sec. 26-331 | Land Disturbing Activity Permit | | | All land disturbing activities within the boundaries of Burke County. | As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Burke County). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-4 Authorizations Required for Construction Activities¹ (Continued)

| Agency | Authority | Requirement | License/ Permit No. | Expiration Date | Activity Covered | Status |
|---|---|---------------------------------|------------------------------------|----------------------------|---|---|
| Various county offices responsible for land disturbing activities | Jefferson, Warren, and McDuffie County Ordinances | Land Disturbing Activity Permit | | | Land disturbing activities within county boundaries for transmission line corridor. | As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Jefferson, Warren and McDuffie Counties). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002. |

¹ Assumes that SNC obtained the authorizations that Table 1.5-2 identifies.

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-5 Authorizations Required for Operation¹

| Agency | Authority | Requirement | License/ Permit No. ² | Expiration Date ² | Activity Covered | Status |
|---|---|---|-------------------------------------|---------------------------------|---|---|
| GDNR | CWA, GA Water Quality Control Act | Revision of existing National Pollutant Discharge Elimination System Permit | | | Regulates limits of pollutants in liquid discharge to surface water. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| GDNR | Federal Clean Air Act (CAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1 | Revision of existing Title V Operating Permit | | | Operation of air emission sources. | SNC submitted a request for modification to this permit along with the PSD/NSR permit application submitted on May 26, 2009. |
| GDNR | GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03 | Revision of existing Permit to Use Groundwater | 017-0003 | 08/06/2010 | Consumptive use of 100,000 gallons per day or more of groundwater. | Received. |
| GDNR | GA Water Quality Control Act (O.C.G.A. 12-5-31 et seq.), GA Rules and Regulations 391-3-6 | Revision of existing Surface Water Withdrawal Permit to Withdraw, Divert or Impound Surface Water | | | Withdraw water from the Savannah River for cooling makeup and in-plant use. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| State of Tennessee Department of Environment and Conservation Division of Radiological Health | Tennessee Department of Environment and Conservation Rule 1200-2-10.32 | Revision of existing Tennessee Radioactive Waste License-for-Delivery | | | Transportation of radioactive waste into the State of Tennessee. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |
| State of Utah Department of Environmental Quality Division of Radiation Control | R313-26 of the Utah Radiation Control Rules | Revision of existing General Site Access Permit | | | Transportation of radioactive materials into the State of Utah. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 1.5-5 Authorizations Required for Operation¹ (Continued)

| Agency | Authority | Requirement | License/ Permit No. ² | Expiration Date ² | Activity Covered | Status |
|--------|--|---|-------------------------------------|---------------------------------|--|---|
| GPSC | GA Radiation Control Act (O.C.G.A. 31-13-1 et seq.), GA Rules and Regulations 391-3-17-.06 | Revision of existing General Permit – Transportation of Radioactive Materials | | | Transportation of radioactive materials in the State of Georgia. | SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. |

¹ Assumes that SNC obtained the authorizations that Tables 1.5-2 and 1.5-4 identify.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

1.5.1 STATUS OF REGULATORY AGENCY CONSULTATIONS

An applicant referencing an ESP EIS must provide the status of environmentally related authorizations and permits potentially required to construct and operate new nuclear units. Tables 1.5-1 through 1.5-5 provide the status of authorizations and permits required at VEGP.

1.5.2 CONFORMANCE WITH DIVISION 4 REGULATORY GUIDES

The supplemental analyses presented in this ER were prepared using the guidance provided in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants." The content guidelines outlined in NUREG-1555 are generally consistent with the guidance contained in Regulatory Guide 4.2. No other Division 4 regulatory guides are applicable to the supplemental analyses presented in the ER.

1.6 REPORT CONTENTS

The ER is organized as follows. Chapter 1 provides the purpose and need for the proposed action, alternatives to the proposed action, the status of regulatory compliance and consultation activities, and the methodology used to prepare the ER. Chapter 2 describes the proposed site and environment that would be affected by the addition of two new reactors at VEGP. Chapter 3 describes the characteristics of the AP1000 power plant, and its interfaces with the environment that are the bases for evaluating environmental impacts. Chapter 4 examines the environmental impacts of construction and Chapter 5 evaluates the environmental impacts of operations to determine the suitability of the VEGP site for the new units. Chapter 6 evaluates the impacts of the uranium fuel cycle, transportation associated with constructing and operating the facility, and decommissioning of the units at the end of plant life. Chapter 7 evaluates the cumulative impacts of the proposed action, and other past, present and reasonably foreseeable actions in the vicinity of VEGP. Chapter 8 examines the need for power. Chapter 9 examines alternatives to the proposed action, alternative locations, and alternative energy sources. Chapter 10 compares the proposed action with alternatives, and Chapter 11 summarizes the findings and conclusions.

1.7 ENVIRONMENTAL REPORT METHODOLOGY

1.7.1 DEMONSTRATION THAT ER CONFORMS WITH REGULATORY REQUIREMENTS

10 CFR Section 51.50(c)(1) states that COLAs referencing an ESP need not contain information or analyses submitted in the ESP application or resolved in the ESP EIS. Still, the ER must contain, in addition to the environmental information and analyses otherwise required (10 CFR 51.50(c)(1)), the following:

- (i) Information to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP.
- (ii) Information to resolve any significant environmental issue that was not resolved in the ESP proceeding.
- (iii) Any new and significant information for issues related to the impacts of construction and operation of the facility that were resolved in the ESP proceeding.

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

- (iv) A description of the process used to identify new and significant information regarding the NRC's conclusions in the ESP EIS.
- (v) A demonstration that all environmental terms and conditions that have been included in the ESP will be satisfied by the date of the issuance of the combined license.

10 CFR 51.50(c)(2) states that if a standard design certification is referenced, the COLA ER must contain information to demonstrate that the site characteristics fall within the parameters in the design certification environmental assessment.

Table 1.7-1 lists the report sections that fulfill the requirements of 10 CFR 51.50(c)(1).

Table 1.7-1 10 CFR 51.50(c)(1) Requirements and EIS Table J-1 Commitments

| Requirement/Commitment | COLA ER Section that Addresses |
|---|--|
| (i) information to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the early site permit Table J-1 An applicant referencing this EIS will demonstrate its application is bounded by the ESP site characteristics contained in Table I-1, Part 1 Table J-1 An applicant referencing this EIS will demonstrate its application is bounded by the AP 1000 design values contained and referenced in Table I-1, Part 2 | Table 3.0-1 |
| (ii) information to resolve any significant environmental issue that was not resolved in the early site permit proceeding | The NRC staff did not identify any unresolved issues in preparation of the EIS. The ASLB resolved two contentions in favor of the NRC and SNC, and terminated the ASLB proceedings on June 22, 2009. |
| (iii) any new and significant information for issues related to the impacts of construction and operation of the facility that were resolved in the early site permit proceeding Table J-1 An applicant referencing this EIS will provide, in its application, any new information that could affect the technical basis of conclusions for determination of an impact level in the EIS. | No new and significant information was identified. Section 1.7.2 describes the process used to make this determination. |
| (iv) a description of the process used to identify new and significant information regarding the NRC's conclusions in the early site permit environmental impact statement. The process must use a reasonable methodology for identifying such new and significant information | Section 1.7.2 |
| (v) a demonstration that all environmental terms and conditions that have been included in the early site permit will be satisfied by the date of the issuance of the combined license | The ESP was issued on August 26, 2009. SNC references the ESP in this ER and discusses how SNC meets or will meet the ESP terms and conditions. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

**Table 1.7-1 10 CFR 51.50(c)(1) Requirements and EIS Table J-1 Commitments
(Continued)**

| Requirement/Commitment | COLA ER Section that Addresses |
|---|--|
| (vi) information to demonstrate that the site characteristics for the combined license site fall within the site parameters in the design certification environmental assessment | Table 3.0-1 |
| Table J-1 An applicant referencing this EIS will demonstrate its application is bounded by the site interface values contained in Table I-1, Part 3 | |
| Table J-1 An applicant referencing this EIS will provide the status of the authorizations and permits specified in Appendix H. | Tables 1.5-1 to 1.5-5. |
| Table J-1 An applicant referencing this EIS will demonstrate its application contains the mitigation measures contained in Section 4.10. | Section 1.7.2 describes the process that SNC used to verify that there is no new and significant information pertaining to EIS Section 4.10. SNC remains committed to the mitigation measures that Section 4.10 describes. |
| Table J-1 An applicant referencing this EIS will demonstrate its application contains the mitigation measures contained in Section 5.11. | Section 1.7.2 describes the process that SNC used to verify that there is no new and significant information pertaining to EIS Section 5.11. SNC remains committed to the mitigation measures that Section 5.11 describes. |
| Procedures for reporting and keeping records of environmental data, and any conditions and monitoring requirements for protecting the non-aquatic environment proposed for possible inclusion in the license as conditions. | COLA Part 10, as referenced in the COLA ER Sections 4.10 and 5.11. |

1.7.2 NEW AND SIGNIFICANT REVIEW

In order to satisfy the requirements of 10 CFR 51.50(c), SNC developed a process to identify any new and significant information regarding issues addressed in the ESP EIS that are required to be included in the environmental review for the COLA. The purpose of the new and significant review is to provide a methodical, comprehensive review of the conclusions presented in the ESP EIS and the supporting information for those conclusions to identify any new and significant information that has the potential to change the NRC's conclusions presented in the ESP EIS. The process ensures that, taken together, the ESP EIS and the COLA EIS present a complete and clear description of the proposed project and its impacts on the affected environment. The search for new and significant information is based on a reasonable process, systematically performed by a qualified investigative team using their best professional judgment. The preamble to the final rule for 10 CFR 50.51 states that in the COL ER review process, the COL EIS "brings forward the Commission's earlier conclusions from the ESP EIS and articulates the activities undertaken by the NRC staff to ensure that an issue that was resolved can remain resolved. If there is new and significant information on a previously resolved issue, then the Staff will limit its inquiry to determine if the information changes the Commission's earlier conclusion" (72 Fed Reg. 49431, Aug. 28, 2007). Per the regulation, the process was applied only to NRC conclusions, most of which occur in Chapters 4 for construction and 5 for operations.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

SNC's process for identifying new and significant information began with a systematic review of the EIS conclusions and supporting information to identify the EIS "key inputs." SNC defines "key inputs" as information or assumptions that the NRC staff relied on to support their findings and conclusions in the EIS. Information on the affected environment and its interactions with the proposed action are found throughout much of the EIS. Key assumptions are in Appendix J of the EIS. Key site characteristics, AP1000 Design Control Document (DCD) parameters, and site interface values are in Appendix I of the EIS. These key inputs identify the main sources of information used in developing the evaluations in the EIS.

New information related to conclusions in the EIS must be identified and evaluated to determine if the new information could alter the evaluation supporting the EIS conclusions, and change the conclusion. The NRC defines new information as any information that was both (1) not considered in preparing the ESP environmental report or EIS and (2) not generally known or publicly available during the preparation of the EIS. For new information to be significant it must be material to the issue being considered, that is, it must have the potential to affect the finding or conclusions of the NRC staff's evaluation of the issue (72 FR 166, pg 49431). For the VEGP EIS, new information was considered to be information that became available after April 2007 or that was generally not available or not known about during the preparation of the ER and EIS. After key inputs were identified, subject matter experts (SMEs), SNC and contractor technical personnel with expert knowledge in their designated subject areas, determined if new information on each key input was available. The SMEs were identified and assigned appropriate topics by the Environmental Project Manager (EPM) with input from contractor management.

The SMEs reviewed recent publications, news releases, and project documents and contacted resource agencies or government offices to inquire if the inputs used in the original analysis were still valid. The conclusion of their search for new information was documented for each key input. Any new information was documented for further review. The SMEs then determined if the new information was of such significance that it could possibly affect the conclusions in the EIS. The basis for the determination of whether the new information was significant or not was also documented. Once the SMEs had identified new information in each topical area, determined if the information was significant, and documented their decision and the rationale for that decision, a package was compiled which included the reference materials that supported the new information. The EPM convened a review team of senior SMEs who reviewed each topical area with the SME to concur or dispute the SME's conclusions.

SNC retained all documentation of the new and significant review process, which is available for an NRC onsite environmental audit.

The initial new and significant process concluded in December 2007 and formed the basis for this environmental report. In August 2008, NRC issued the final EIS for ESP which did not identify any unresolved issues. SNC performed a second new and significant review that concluded in June 2009. Because no new and significant information was identified, this ER relies entirely on the conclusions of the ESP EIS. SNC's ESP ER was developed with the intent of leaving no items unresolved, in order to minimize the number of environmental issues left unresolved by the ESP proceeding. In each chapter of the COLA ER, SNC provides a brief summary description of the information covered by the chapter and references to the relevant chapter of the ESP EIS. Updated information is provided, where appropriate.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

1.8 REFERENCES

GPC 2007. Georgia Power Company. 2007. Application for Approval of Its 2007 Integrated Resource Plan; Docket Number 24505-U. Atlanta Ga. January 30, 2007.

NRC 2005. U.S. Nuclear Regulatory Commission. 2005. Environmental Assessment by the U.S. Nuclear Regulatory Commission Relating to the Certification of the AP1000 Standard Plant Design. Docket No. 52-006. Washington, D.C. March 18, 2005.

SNC 2008. Southern Nuclear Operating Company. 2008. Vogtle Early Site Permit Application: Site Redress Plan, Rev. 5. Birmingham, AL. December.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

2.0 AFFECTED ENVIRONMENT

Chapter 2 describes the VEGP site, the vicinity or the region, as appropriate, for each environmental topic that could be affected by the construction or operation of two new nuclear units at the VEGP site.

2.1 SITE LOCATION

VEGP ESP EIS Chapter 2, Section 2.1 described the VEGP site and the proposed locations of the new reactors. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to the site location.

2.2 LAND

VEGP ESP EIS Chapter 2, Section 2.2 described the habitat types on the VEGP site and the proposed transmission line corridor, the land uses in the vicinity and region, access to the site, and nearby communities. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this resource.

2.3 METEOROLOGY AND AIR QUALITY

VEGP ESP EIS Chapter 2, Section 2.3 described the climate and air quality of the VEGP site and region and the existing meteorological monitoring program at the VEGP site. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to these topics.

2.4 GEOLOGY

VEGP ESP EIS Chapter 2, Section 2.4 described the basic geology underlying the VEGP site and region. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

2.5 RADIOLOGICAL ENVIRONMENT

VEGP ESP EIS Chapter 2, Section 2.5 described radiological doses to the maximally exposed individual due to operation of VEGP Units 1 and 2 as <0.1 mrem per year for the years 2001 – 2004. The NRC also reviewed studies of tritium concentrations in the water table aquifer and determined that atmospheric deposition, not transriver flow from the Savannah River Site, is the source of elevated tritium concentrations. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to the radiological environment.

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

2.6 WATER

VEGP ESP EIS Chapter 2, Section 2.6 described the hydrological processes governing movement and distribution of ground water and surface water, water use, and water quality in the vicinity of the VEGP site. Section 2.6 also described the existing VEGP hydrological monitoring program and the chemical monitoring required under the existing VEGP National Pollutant Discharge Elimination System (NPDES) permit. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this resource.

2.7 ECOLOGY

VEGP ESP EIS Chapter 2, Section 2.7 described the terrestrial and aquatic ecology in the vicinity of the VEGP site. Section 2.7 also described the ecology in the vicinity of the proposed transmission line. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to ecological resources.

2.8 SOCIOECONOMICS

VEGP ESP EIS Chapter 2, Section 2.8 described the socioeconomics of the region of interest for the VEGP site. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

2.9 HISTORIC AND CULTURAL RESOURCES

VEGP ESP EIS Chapter 2, Section 2.9 described the historic background and cultural resources known on the site. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to historic or cultural resources.

2.10 ENVIRONMENTAL JUSTICE

VEGP ESP EIS Chapter 2, Section 2.10 described the minority and low-income populations within the region around VEGP. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

2.11 RELATED FEDERAL PROJECTS AND CONSULTATION

VEGP ESP EIS Chapter 2, Section 2.11 described Federal activities in the region surrounding VEGP. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

3.0 SITE LAYOUT AND PLANT DESCRIPTION

Chapter 3 describes the two AP1000 units proposed for the VEGP site and their auxiliary systems.

NRC regulations at 10 CFR 51.50(c)(1)(i) require that a COL application referencing an ESP contain information to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP. NRC regulations at 10 CFR 51.50(c)(2) require a COLA environmental report referencing a standard design certification to demonstrate that the site characteristics fall within the parameters in the design certification environmental assessment.

Table 3.0-1 demonstrates that the site characteristics, design parameters, and site interface values considered in this COL application fall within those described in the ESP or within Rev. 17 of the AP1000 Design Control Document (DCD) and its associated technical reports.

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Part I Site Characteristic Item | ESP | | Description and Reference | COL | | Comments |
|--|--|----------------------------|---|------------------------------|----------------------------|---------------------|
| | Single Unit [Two Unit] Value | | | Single Unit [Two Unit] Value | | |
| Airborne Effluent Release Point | | | | | | |
| Minimum Distance to Exclusion Area Boundary (EAB) | ½ mi (~800 m) | | The lateral distance from the release point (power block area) to the modeled EAB for dose analysis. | ½ mi (~800 m) | | Unchanged from ESP. |
| Atmospheric Dispersion (χ/Q) (Accident) | The atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases. | | | | | |
| | Time (hour) | Site χ/Q | Atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases. (From Table 5-13 of the EIS) | Time (hour) | Site χ/Q | Unchanged from ESP. |
| EAB (χ/Q) | 0 - 2 EAB | 7.38E-5 sec/m ³ | | 0 - 2 EAB | 7.38E-5 sec/m ³ | |
| Low Population Zone (LPZ) (χ/Q) | 0 - 8 LPZ | 1.40E-5 sec/m ³ | | 0 - 8 LPZ | 1.40E-5 sec/m ³ | |
| | 8 - 24 LPZ | 1.22E-5 sec/m ³ | | 8 - 24 LPZ | 1.22E-5 sec/m ³ | |
| | 24 - 96 LPZ | 9.15E-6 sec/m ³ | | 24 - 96 LPZ | 9.15E-6 sec/m ³ | |
| | 96 - 720 LPZ | 6.04E-6 sec/m ³ | 96 - 720 LPZ | 6.04E-6 sec/m ³ | | |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Part I Site Characteristic Item | ESP | | COL | |
|--|--|--|--|---|
| | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Gaseous Effluents Dispersion, Deposition (Annual Average) | | | | |
| Atmospheric Dispersion (χ/Q) | See Table 3.0-2 . | The atmospheric dispersion coefficients used to estimate dose consequences of normal airborne releases. | χ/Q values as described in ESP | Unchanged from ESP. |
| Population Density | | | | |
| Population density over the lifetime of the new units until 2090 | Population density meets the guidance of RS-002, Attachment 3 | | Population density meets the guidance of RS-002, Attachment 3 | Unchanged from ESP. |
| EAB | Refer to Figure 2-1 in the EIS | The exclusion area boundary generally follows the plant property line. | Refer to Figure 3.2-1 in the ER | Unchanged from ESP. |
| LPZ | A 2-mile-radius from the midpoint between the containment buildings of Units 1 and 2 | The LPZ is a circle with a radius of 2 miles, centered on the midpoint between Unit 1 and Unit 2 containment buildings | A 2-mile-radius from the midpoint between the containment buildings of Units 1 and 2 | Unchanged from ESP. |
| Height | 234 ft 0 in | The height from finished grade to the top of the tallest power block structure, excluding cooling towers | 229 ft 0 in | (DCD Rev 17, Table 3.3-5) The height affects aesthetic impacts and the potential for bird collisions. Because this height is lower than that analyzed in the ESP application, the impacts are bounded by those impacts |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Part II Design Parameters | ESP | | COL | |
|---|--|---|--|---|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Facility Characteristics | | | | |
| Foundation Embedment | 39 ft 6 in to bottom of basemat from plant grade | The depth from finished grade to the bottom of the basemat for the most deeply embedded power block structure. | 39 ft 6 in to bottom of basemat from plant grade | Unchanged from ESP. |
| Max Inlet Temp Condenser / Heat Exchanger | 91°F | The maximum acceptable design circulating water temperature at the inlet to the condenser or cooling water system heat exchangers. | 91°F | Unchanged from ESP. |
| Condenser / Heat Exchanger Duty | 7.55E9 BTU/hr [1.51E10 BTU/hr] | Design value for the waste heat rejected to the circulating water system across the condensers. Selected value includes part of the service water system heat duty (from turbine equipment heat exchanger). | 7.63E9 BTU/hr [1.53E10 BTU/hr] | Estimated heat load has increased by 1 percent. See Section 3.2.2 . |
| Cooling Tower Temperature Range | 25.2°F | The temperature difference between the hot water entering the tower and the cold water leaving the tower. | 25.2°F | Unchanged from ESP. |
| Cooling Tower Cooling Water Flow Rate | 600,000 gpm [1,200,000 gpm] | The total nominal cooling water flow rate through the condenser/ heat exchangers. | 631,000 gpm [1,262,000 gpm] | Estimated flow rate has increased by 62,000 gpm or 5 percent. See Section 3.2.2 . |

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

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

| Part II Design Parameters | ESP | | COL | |
|--|---|---|---|---------------------|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Auxiliary Heat Sink | | | | |
| Component Cooling Water (CCW) Heat Exchanger Duty | 8.3E7 BTU/hr normal 2.96E8 BTU/hr shutdown [1.66E8 BTU/hr normal 5.92E8 BTU/hr shutdown] | The heat transferred from the CCW heat exchangers to the service water system for rejection to the environment. | 8.3E7 BTU/hr normal 2.96E8 BTU/hr shutdown [1.66E8 BTU/hr normal 5.92E8 BTU/hr shutdown] | Unchanged from ESP. |
| Service Water System (SWS) Cooling Tower Cooling Water Flow Rate | 9,000 gpm normal 18,000 gpm shutdown [18,000 gpm normal 36,000 gpm shutdown] | The total nominal cooling water flow rate through the SWS. | 9,000 gpm normal 18,000 gpm shutdown [18,000 gpm normal 36,000 gpm shutdown] | Unchanged from ESP. |
| Plant Characteristics | | | | |
| Rated Thermal Power (RTP) | 3,400 MWt | The thermal power generated by the core. | 3,400 MWt | Unchanged from ESP. |
| Rated Nuclear Steam Supply System (NSSS) Thermal Output | 3,415 MWt [6,830 MWt] | The thermal power generated by the core plus heat from the reactor coolant pumps. | 3,415 MWt [6,830 MWt] | Unchanged from ESP. |
| Average Fuel Enrichment | 2.35 wt % to 4.45 wt % 4.51 wt % | Concentration of U-235 in fuel - initial load. Average concentration, in weight percent, of U-235 in reloads | 2.35 wt % to 4.45 wt % 4.51 wt % | Unchanged from ESP. |

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

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

| Part II Design Parameters | ESP | | COL | |
|---------------------------|--|---|--|---------------------|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Fuel Burn-up | 60,000 MWd/MTU (design max) 48,700 MWd/MTU (expected) | Value derived by multiplying the reactor thermal power by time of irradiation divided by fuel mass (expressed in megawatt - days per metric ton of uranium fuel). | 60,000 MWd/MTU (design max) 48,700 MWd/MTU (expected) | Unchanged from ESP. |
| Normal Releases | | | | |
| Liquid Source Term | See Table G-1 of the EIS 0.26 curies total nuclides except tritium [0.52 curies] | The annual activity, by isotope, contained in routine liquid effluent streams. | 0.26 curies total nuclides except tritium [0.52 curies] | Unchanged from ESP. |
| Tritium (liquid) | 1010 curies [2020 curies] | The annual activity of tritium contained in routine liquid effluent streams | 1010 curies [2020 curies] | Unchanged from ESP. |
| Gaseous Source Term | See Table G-4 of the EIS 11,000 curies total nuclides except tritium [22,000 total curies] | The annual activity, by isotope, contained in routine plant airborne effluent streams. | 11,000 curies total nuclides except tritium [22,000 total curies] | Unchanged from ESP. |
| Tritium (gaseous) | 350 curies [700 curies] | The annual activity of tritium contained in routine plant airborne effluent streams. | 350 curies [700 curies] | Unchanged from ESP. |

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

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

| Part II Design Parameters | ESP | | COL | |
|-------------------------------------|---|--|---|--|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Solid Waste Activity | 1764 curies [3528 curies] | The annual activity contained in solid radioactive wastes generated during routine plant operations. | 1764 curies [3528 curies] | Unchanged from ESP. |
| Dry Active (“Solid”) Waste Volume | 4994 ft ³ [9988 ft ³] | The expected volume of solid radioactive wastes generated during routine plant operations. | 4994 ft ³ [9988 ft ³] | Unchanged from ESP. |
| Part III Site Interface Values | ESP | | COL | |
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Accident Releases | | | | |
| Elevation (Post Accident) | groundlevel at edge of power block circle | The elevation above finished grade of the release point for accident sequence release analyses | groundlevel at edge of power block circle | Unchanged from ESP. |
| Gaseous Source Term (Post-Accident) | See ESP Application ER Table 7.1-11 | The activity, by isotope, contained in post-accident airborne effluents. | See DCD, Rev 17, Table 15A-5. | Unchanged from ESP. Doses resulting from changes to χ/Q ratios are presented and discussed in Table 5.10-1 . |

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

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

| Part III Site Interface Values | ESP | | COL | |
|---|--|--|--|--|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Normal Plant Heat Sink (condenser and turbine auxiliary cooling) | | | | |
| CWS Cooling Tower Acreage | 38 acres [69.3 acres] | The land required for CWS natural draft cooling towers, including support facilities such as equipment sheds, basins, or canals, | 38 acres [69.3 acres] | Unchanged from ESP. |
| CWS Cooling Tower Approach Temperature | 11°F | The difference between the cold water temperature leaving the tower and the ambient wet bulb temperature. | 11°F | Unchanged from ESP. |
| CWS Cooling Tower Blowdown Temperature | 91°F | The design maximum expected blowdown temperature at the point of discharge to the receiving water body. | 91°F | Unchanged from ESP. |
| CWS Cooling Tower Evaporation Rate | 13,950 gpm (14,440 gpm) [27,900 gpm (28,880 gpm)] | The expected (and maximum) rate at which water is lost by evaporation from the cooling water systems. | 14,550 gpm (15,280 gpm) [29,100 gpm (30,560 gpm)] | Average expected evaporation rates have increased by 4 percent and maximum expected evaporation rates have increased by 6 percent. See Section 3.2.1 . |
| CWS Cooling Tower Drift Rate | 12 gpm [24 gpm] | The maximum rate at which water is lost by drift from the cooling water systems. | 12.5 gpm [25 gpm] | Maximum expected drift loss has increased by 0.5 gpm per unit. See Section 3.2.1 . |
| CWS Cooling Tower Height | 600 ft | The vertical height above finished grade of the natural draft cooling tower. | 600 ft | Unchanged from ESP. |

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

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

| Part III Site Interface Values | ESP | | COL | |
|---|--|--|---|---|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| CWS Cooling Tower Make-up Flow Rate | 18,612 gpm (28,892 gpm) [37,224 gpm (57,784 gpm)] | The expected (and maximum) design rate of removal of water from the Savannah River to replace water losses from circulating water systems. The make-up flow rate is a calculated value based on the sum of the evaporation rate plus the blowdown flow rate plus drift. | 19,412 gpm (30, 572 gpm) [38,825 gpm (61,145)] | The expected design rate of removal of water from the Savannah River has increased 4% and the maximum has increased 6%. See Section 3.2.1 . |
| CWS Cooling Tower Offsite Noise Levels | <30 to ≤40 dBA | The maximum expected sound level at the site boundary. | <30 to ≤40 dBA | Unchanged from ESP. |
| CWS Cooling Tower Heat Rejection Rate (Blowdown) | 4650 gpm (expected), 14,440 gpm (max) @91°F [9300 gpm (expected), 28,880 gpm (max)] @91°F | The expected heat rejection rate to a receiving water body, expressed as flow rate in gallons per minute at a temperature in degrees Fahrenheit. | 4850 gpm (expected) 15,280 gpm (max) @91°F [9700 gpm (expected) 30,560 gpm (max)] @ 91°F | The expected heat rejection rate to the receiving body has increased by 4 percent and the maximum by 6 percent. See Section 3.2.1 . |
| CWS Cooling Tower Maximum Consumption of Raw Water | 14,452 gpm [28,904 gpm] | The expected maximum short-term consumptive use of water by the circulating water systems (evaporation and drift losses). | 15,292 gpm [30,585 gpm] | The expected maximum short-term consumptive use of water by the circulating water systems (evaporation and drift losses) has increased 6 percent. See Section 3.2.1 . |
| CWS Cooling Tower Expected Consumption of Raw Water | 13,692 gpm [27,924 gpm] | The expected normal operating consumptive use of water by the circulating water systems (evaporation and drift losses). | 14,562 gpm [29,125 gpm] | The expected normal operating consumptive use of water by the circulating water systems (evaporation and drift losses) has increased 4 percent. See Section 3.2.1 . |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Part III Site Interface Values | ESP | | COL | |
|--|--|--|---|---|
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| SWS Cooling Tower Makeup Rate | 269 gpm (1177 gpm) [537 gpm (2353 gpm)] | The expected (maximum) rate of removal of water from wells to replace water losses from auxiliary heat sink. | 269 gpm (800 gpm) [537 gpm (1600 gpm)] | The expected normal groundwater makeup rate for the auxiliary heat sink is unchanged from ESP. The maximum rates have decreased. SNC believes that the analysis in the EIS is bounding, and that any impacts would be less than those described in the EIS. The decrease would not change the NRC's analysis of SMALL impacts. See Section 3.2.1 . |
| Airborne Effluent Release Point | | | | |
| Normal Dose Consequences to the Maximally Exposed Individual | Total body: 1.12 mrem [2.24 mrem] | The estimated annual design radiological dose consequences due to gaseous releases from normal operation of the plant (Table 3.0-1 of ESP Application ER Rev 4) is not correct. See Section 5.4.2.2. | Total body: 1.12 mrem [2.24 mrem] | Unchanged from ESP. |
| Post-Accident Dose Consequences | See Tables 5-14 in the EIS. | The estimated design radiological dose consequences due to gaseous releases from postulated accidents. | See Table 5.10-1 | Design-basis accidents were recalculated using updated information from DCD, Rev 17. All dose consequences remained the same or decreased except those for a loss-of-coolant accident, which increased by 2.86 percent, but remains below the regulatory criterion of 25 rem.. |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Liquid Radwaste System | | | | |
|---------------------------------------|--|--|---|--|
| Normal Dose Consequences | 10 CFR 50, App I, 10 CFR 20 40 CFR 190 | The estimated design radiological dose consequences due to liquid effluent releases from normal operation of the plant. | 10 CFR 50, App I, 10 CFR 20 40 CFR 190 | Unchanged from ESP. |
| Part III Site Interface Values | ESP | | COL | |
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Plant Characteristics | | | | |
| Total Acreage | 310 acres for 2 units | The land area required to provide space for all plant facilities, including power block, switchyard, spent fuel storage, and administrative facilities. | 376 acres for 2 units | Acreage increased by 66 acres. Acreages for many of the permanent facilities increased or decreased by a few acres between ESP and COL.. The new acreage estimate includes the fire training facility and the simulator building, which were not included in previous estimates, and together account for 44 of the additional 66 acres. SNC does not believe this increase on a site with almost 1,400 acres in a rural county would change NRC's significance evaluation of SMALL impacts to land use. |
| Groundwater Consumptive Use | 376 gpm (1570 gpm) [752 gpm (3140 gpm)] | The expected (maximum) rate of withdrawal of groundwater to serve the new units. (Table 3.0-1 in the ESP Application listed the expected gpm for 2 units as 762, which was a typographical error.) | 376 gpm (1398.5 gpm) [752 gpm (2797 gpm)] | The maximum rate of withdrawal of groundwater to serve the new units has decreased by approximately 11 percent. See Section 3.2.1 . SNC believes that the analysis in the ESP bounds this value, and that NRC's conclusion of SMALL impacts would not change. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

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

| Plant Population | | | | |
|---------------------------------------|--|---|---|---|
| Operation | 345 [600] | The number of people required to operate and maintain the plant | 400 [800] | SNC reviewed the socioeconomic impacts of the increased workforce on the counties most likely to be affected and concluded that because the increase would occur as the larger construction workforce left the area, NRC's conclusions on the significance of the impacts would not change. |
| Part III Site Interface Values | ESP | | COL | |
| Item | Single Unit [Two Unit] Value | Description and Reference | Single Unit [Two Unit] Value | Comments |
| Refueling / Major Maintenance | 1000 | The additional number of temporary staff required to conduct refueling and major maintenance activities | 1000 | Unchanged from ESP. |
| Construction | 1576 people monthly average [3152 people monthly average] | The monthly average estimated construction workforce staffing for two AP1000 units being constructed simultaneously. This assumes a site preparation schedule of 18 months, 48 months from first concrete to fuel load, with 6 months from fuel load to commercial operation and 12 months between commercial operation of each unit. This assumes 20.5 job hours per net kilowatt installed, giving credit for offsite modular construction. The peak number of construction workforce personnel could reach the 4400 range. | [3500], excluding SNC and NRC employees | The ESP estimated a peak construction work force of 4400. The COLA estimate has been reduced. Because the COLA estimate does not include the SNC and the NRC staff that would be in the area, SNC has determined that the ESP conclusions are bounding and that the NRC's significance determination of the impacts of the construction workforce would not change. |

**Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 3.0-2 XOQDOQ-Predicted Maximum χ/Q and D/Q Values at Receptors of Interest

| Type of Location | Direction from Site | Distance in meters (Miles) | χ/Q (sec/m ³) (No Decay) (Undepleted) | χ/Q (sec/m ³) (2.26 Day Decay) (Undepleted) | χ/Q (sec/m ³) (8 Day Decay) (Depleted) | D/Q (1/m ²) |
|----------------------|---------------------|----------------------------|--|--|---|-------------------------|
| Residence | NE | 1071 (0.67) | 3.4E-06 | 3.4E-06 | 3.0E-06 | 1.0E-08 ^a |
| Dose Calculation EAB | NE | 800 (0.5) | 5.5E-06 | 5.5E-06 | 5.0E-06 | 1.7E-08 ^b |
| Meat Animal | NE | 1071 (0.67) | 3.4E-06 | 3.4E-06 | 3.0E-06 | 1.0E-08 ^a |
| Vegetable Garden | NE | 1071 (0.67) | 3.4E-06 | 3.4E-06 | 3.0E-06 | 1.0E-08 ^a |

a. NE, ENE, and E

b. NE and ENE

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

3.1 EXTERNAL APPEARANCE AND LAYOUT

VEGP ESP EIS Chapter 3, Section 3.1 described the external appearance and layout of the new reactors at VEGP. Figure 3.2-1 provides the most recent plant layout. The Independent Spent Fuel Storage Installation is now planned for a site southeast of the Units 1 and 2 cooling towers. A Low Level Radioactive Waste Storage Facility has been completed northwest of the Units 1 and 2 cooling towers. SNC has identified no other new information related to this topic.

3.2 PLANT DESCRIPTION

VEGP ESP EIS Chapter 3, Section 3.2 described the AP1000 reactor and its primary auxiliary systems. The EIS did not identify any required information or analyses that were not resolved.

3.2.1 PLANT WATER USE

VEGP ESP EIS Chapter 3, Section 3.2.1 described the estimated plant surface and groundwater use. The plant water use presented here differs from that presented in the VEGP ESP Application ER (SNC 2008) and the EIS (NRC 2008).

3.2.1.1 Surface Water

The circulating water system's estimated normal evaporation, drift, blowdown, and makeup values have increased by 4 percent, based on conservative assumptions and a different cooling tower vendor's design specifications than those used for the ESP application; the maximum estimates have increased 6 percent (Table 3.2-1).

Table 3.2-1 Revised Cooling Water System Estimates for Two Units

| Parameter | Normal Operations (gpm) | | | Maximum Operations (gpm) | | |
|----------------|-------------------------|--------|----------------|--------------------------|--------|----------------|
| | ESP | COLA | percent change | ESP | COLA | percent change |
| Evaporation | 27,900 | 29,100 | +4 | 28,880 | 30,560 | +6 |
| Drift (0.002%) | 24 | 25 | +4 | 24 | 25 | +4 |
| Blowdown | 9300 | 9700 | +4 | 28,880 | 30,560 | +6 |
| Total Make Up | 37,224 | 38,825 | +4 | 57,784 | 61,145 | +6 |

gpm = gallons per minute

The final cooling tower design and vendor have not been determined for the new units at VEGP; however, SNC believes that the assumptions made to estimate the values presented in Table 3.2-1 provide an upper limit to the design parameters of any natural draft cooling tower that would be constructed at VEGP.

3.2.1.2 Groundwater

Groundwater use during operations is now estimated to be 2797 gpm in the maximum use case, an 11 percent decrease (Table 3.2-2). The decrease is primarily due to decrease in service water system make-up water needs. Table 3.2-2 describes all revisions to the plant water use system.

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

SNC has identified no additional new information related to plant water use. The EIS did not identify any required information or analyses that were not resolved.

**Table 3.2-2 Revised Plant Groundwater Estimates and Plant Effluent Streams
for Two Units**

| Stream Description | Normal Case ^a (gpm) | | Maximum Case ^{a,b} (gpm) | | Comments |
|--|--------------------------------|------|-----------------------------------|-------------------|----------|
| | ESP | COLA | ESP | COLA | |
| Groundwater (Well) Streams: | | | | | |
| Plant Well Water Demand | 752 | 752 | 3140 | 2797 | |
| Well Water for Service Water System Makeup | 537 | 537 | 2353 | 1600 | |
| • Service Water System Consumptive Use | 403 | 403 | 1177 | 1100 ^g | |
| - Service Water System Evaporation | 402 | 402 | 1176 | 1099 ^g | |
| - Service Water System Drift | 1 | 1 | 1 | 1 ^g | |
| • Service Water System Blowdown | 134 | 134 | 1176 | 500 | |
| Well Water for Power Plant Make-up/ Use | 215 | 215 | 787 | 1197 | |
| • Demineralized Water System Feed | 150 | 150 | 600 | 1080 | |
| - Plant System Make-up/ Processes | 109 | 109 | 519 | 999 ^g | |
| - Misc. Well Water Users | 41 | 41 | 81 | 81 ^g | |
| • Potable Water Feed | 42 | 42 | 140 | 70 | |
| • Fire Water System | 10 | 10 | 12 | 12 ^g | |
| • Misc. Well Water Users | 13 | 13 | 35 | 35 ^g | |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

**Table 3.2-2 Revised Plant Groundwater Estimates and Plant Effluent Streams
for Two Units (Continued)**

| Stream Description | Normal Case ^a (gpm) | | Maximum Case ^{a,b} (gpm) | | Comments |
|---|--------------------------------|-------|-----------------------------------|---------------------|----------|
| | ESP | COLA | ESP | COLA | |
| Plant Effluent Streams | | | | | |
| Plant Effluent Discharge to River | 9,474 | 9,874 | 92,585 | 31,195 | |
| • Blowdown Sump Discharge | 9,471 | 9,871 | 29,385 | 30,995 | c |
| - Wastewater Reterntion Basin Discharge | 171 | 171 | 505 | 435 | c |
| - Miscellaneous Low Volume Waste | 129 | 129 | 365 | 365 ^g | |
| - Treated Sanitary Waste | 42 | 42 | 140 | 70 | c |
| - Circulating Water / Turbine Plant Cooling Water System Blowdown | 9,300 | 9,700 | 28,880 | 30,560 ^g | d |
| - Service Water System Blowdown | 134 | 134 | 1176 | 500 | d |
| - Start-up Pond Discharge | 0 | 0 | 0 | 0 ^g | e |
| • Treated Liquid Radwaste | 3 | 3 | 200 | 200 ^g | f |

NOTES:

^a The flow rate values are for two AP1000 units.

^b These flows are not necessarily concurrent.

^c Per SNC the sanitary waste from Units 3 and 4 will be routed to the existing Unit 1 and 2 sewage treatment plant and will be discharged via the existing Unit 1 and 2 outfall. (No change in value, change in discharge point). Because of this the 70 gpm is not included in the “Blowdown Sump Discharge” figure but is included in the “Final Effluent Discharge to the River.”.

^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.

^g These values were inadvertently omitted from Rev 0 and do not constitute a change from Rev 0.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

3.2.2 COOLING SYSTEM

VEGP ESP EIS Chapter 3, Section 3.2.2 described the proposed cooling system for the new units at VEGP, including operational modes and cooling water intake, treatment, and discharge systems.

Cooling tower heat load has increased from 7.55E9 Btu/hr per unit to 7.63E9 Btu/hr per unit and cooling water flow rate has increased to 631,000 gallons per minute from 600,000 (Westinghouse 2008; Table 10.4.5-1). SNC believes that a 1 percent change in heat load would not significantly change the impacts of cooling towers or thermal discharge to the Savannah River or the NRC's conclusions regarding those impacts. SNC believes that a 5 percent increase in discharge flow would not change the impacts to the Savannah River, or NRC's conclusions regarding those impacts.

The dimensions of the intake structure have been modified slightly and the dimensions as currently planned are shown in Figures 3.2-1 and 3.2-2. The intake design includes a weir wall with an elevated lip segregating the intake canal bottom from the river bottom. However, the location and overall design are unchanged from that presented in the ESP application.

SNC has identified no additional new information related to the plant's cooling system. The EIS did not identify any required information or analyses that were not resolved.

3.2.3 RADIOACTIVE WASTE MANAGEMENT SYSTEM

VEGP ESP EIS Chapter 3, Section 3.2.3 described the proposed liquid, gaseous, and solid radioactive waste management systems.

The Independent Spent Fuel Storage Installation is now planned for a site southeast of the Units 1 and 2 cooling towers. A Low-Level Radioactive Waste Storage Facility has been completed northwest of the Units 1 and 2 cooling towers (See Figure 3.2-1) to store low-level radioactive waste generated by activities at the existing units as well as the proposed units that can not be sent to a licensed offsite disposal facility. SNC has identified no other new information related to this topic.

3.2.4 NONRADIOACTIVE WASTE SYSTEMS

VEGP ESP EIS Chapter 3, Section 3.2.4 described the nonradioactive waste management systems including effluents containing chemicals or biocides, sanitary system effluents, and other effluents.

SNC has identified no new information related to effluents containing chemicals or biocides, sanitary system effluents, or other effluents. The EIS did not identify any required information or analyses that were not resolved.

3.3 POWER TRANSMISSION SYSTEM

VEGP ESP EIS Chapter 3, Section 3.3 described the proposed power transmission system from VEGP Units 3 and 4. SNC has identified no new information related to this topic. The EIS did not identify any required information or analyses that were not resolved.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

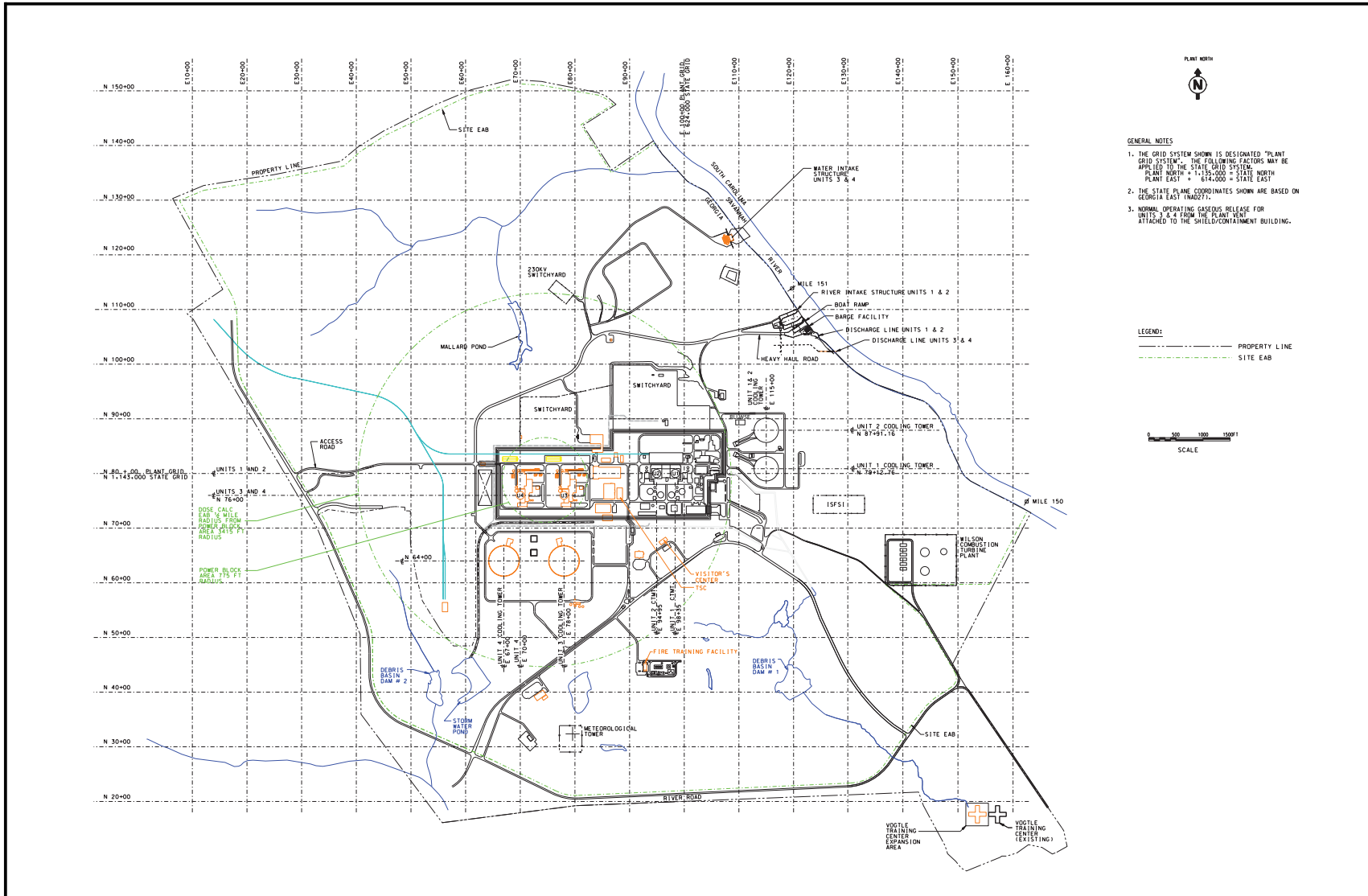
3.4 REFERENCES

SNC 2008. Southern Nuclear Operating Company. 2008. Vogtle Early Site Permit Application: Environmental Report, Rev. 5. Birmingham, AL. December.

NRC 2008. U. S. Nuclear Regulatory Commission. 2008. Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site. NUREG-1872. Office of New Reactors, Washington, DC. August.

Westinghouse 2008. Westinghouse Electric Company. 2008. AP1000 Design Control Document. AP1000 Document APP-GW-GL-700, Rev. 17. Pittsburgh, PA.

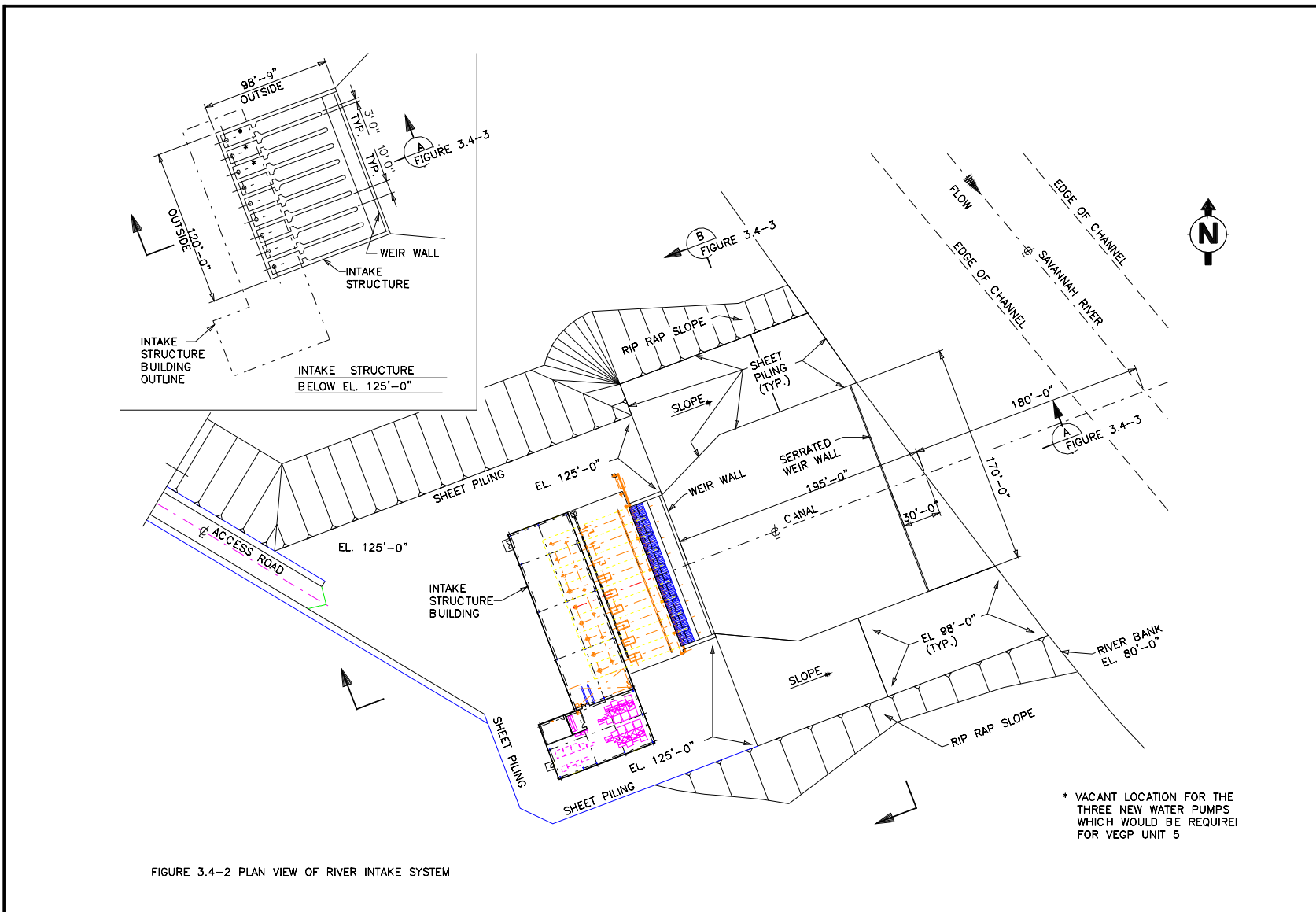
Vogtle Electric Generating Plant, Units 3 & 4 COL Application Part 3 – Environmental Report



VEGP COL

Figure 3.1-1
Revised Site Plan

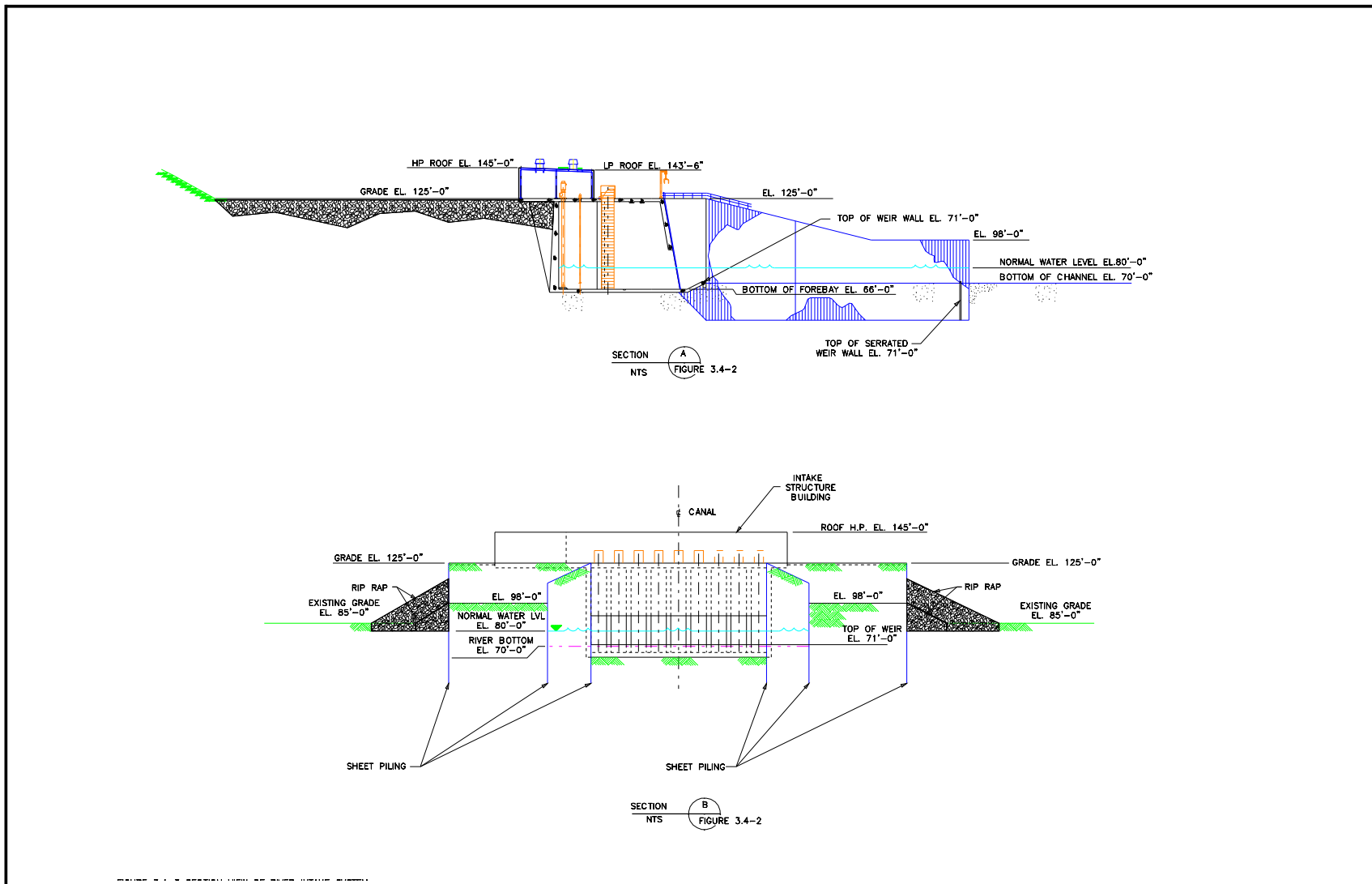
Vogle Electric Generating Plant, Units 3 & 4
 COL Application
 Part 3 – Environmental Report



VEGP COL

Figure 3.2-1
 Revised Intake Dimensions

Vogtle Electric Generating Plant, Units 3 & 4
 COL Application
 Part 3 – Environmental Report



VEGP COL

Figure 3.2-2
 Revised Intake Elevation

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

4.0 CONSTRUCTION IMPACTS AT THE PROPOSED SITE

Chapter 4 describes the effects of constructing two new units at the VEGP site and a new transmission line. The NRC staff relied on mitigation measures; the required federal, state, and local permits and authorizations; and on infrastructure upgrades planned by counties, cities, and towns in reaching its conclusions regarding the significance of the effects.

4.1 LAND-USE IMPACTS

VEGP ESP EIS Chapter 4, Section 4.1 described the land-use effects of constructing two new units at the VEGP site and of constructing a new transmission line. Land-use effects, except for the transmission line, would be limited to the VEGP site, and all effects to the VEGP site would be SMALL and would not warrant mitigation beyond that identified by SNC. Impacts along the final route of the transmission line cannot be fully characterized at this time, and could be MODERATE. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.2 METEOROLOGICAL AND AIR-QUALITY IMPACTS

VEGP ESP EIS Chapter 4, Section 4.2 described the effects of constructing two new units at VEGP on the climate and air quality of the VEGP site and region. Construction effects would be temporary and SMALL and would not require additional mitigation beyond what SNC proposed. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.3 WATER-RELATED IMPACTS

VEGP ESP EIS Chapter 4, Section 4.3 described the effects of constructing two new nuclear units at the VEGP site including the water usage by construction activities on hydrological processes, water resources, and water quality, and noted that the effects would be similar to those associated with any large construction project, and would be SMALL and would not require additional mitigation beyond what SNC proposed. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.4 ECOLOGICAL IMPACTS

VEGP ESP EIS Chapter 4, Section 4.4 described the effects of constructing two new nuclear units at the VEGP site and a new transmission line on terrestrial and aquatic ecology, including protected species and wildlife habitat. The NRC concluded that construction activities at the VEGP site would have SMALL effects on terrestrial and aquatic resources, and that mitigation beyond what SNC has proposed would not be warranted. The precise route of the transmission line has not been identified. Therefore, the NRC determined that effects to terrestrial resources along the transmission line could be MODERATE, but effects to aquatic resources would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

4.5 SOCIOECONOMIC IMPACTS

VEGP ESP EIS Chapter 4, Section 4.5 described the effects of constructing two new nuclear units at the VEGP site on socioeconomic conditions. Construction effects on the local economies would be beneficial and SMALL. The effect on tax revenues would be beneficial and SMALL, except in Burke County where they are expected to be beneficial and MODERATE. The temporary effects of construction traffic would be MODERATE on the two-lane highways in Burke County, particularly River Road and the roadways that feed into it and SMALL elsewhere. Aesthetic and recreational effects would be SMALL at the VEGP site, but aesthetic effects of the transmission line could be MODERATE. The effects on public services would be SMALL. The overall effects on infrastructure and community services would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.6 HISTORIC AND CULTURAL RESOURCE IMPACTS

VEGP ESP EIS Chapter 4, Section 4.6 described the effects of constructing two new nuclear units at the VEGP site, and a new transmission line on historic and cultural resources. The NRC concluded that effects to cultural resources would be MODERATE. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.7 ENVIRONMENTAL JUSTICE IMPACTS

VEGP ESP EIS Chapter 4, Section 4.7 evaluated the effects of construction on the health and welfare of minority or low income populations within the region. The NRC concluded that adverse effects to these populations would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.8 NON-RADIOLOGICAL HEALTH IMPACTS

VEGP ESP EIS Chapter 4, Section 4.8 evaluated the health effects of constructing two new units at VEGP on the residents in the area, the Units 1 and 2 workforce, and the construction workforce. Non-radiological effects from fugitive dust, noise, transport of materials and personnel, and occupational injuries would be SMALL, and would not warrant mitigation beyond that proposed by SNC. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

4.9 RADIOLOGICAL HEALTH IMPACTS

VEGP ESP EIS Chapter 4, Section 4.9 described the effects of radiation exposure from Units 1 and 2 on the construction workforce. Doses to the workforce would be well below NRC annual exposure limits and the effects of radiological exposure to the construction workforce would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

4.10 MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING SITE PREPARATION ACTIVITIES AND CONSTRUCTION

VEGP ESP EIS Chapter 4, Section 4.10 summarizes the measures and controls SNC would invoke to ensure that effects are minimized. EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic. [Part 10](#) of the COLA includes a draft environmental protection plan that identifies proposed conditions, monitoring, reporting, and record keeping for environmental data during construction.

4.11 SITE REDRESS PLAN

VEGP ESP EIS Chapter 4, Section 4.11 described SNC activities to redress the VEGP site should the project be cancelled after construction began. In December 2008 SNC submitted a revised site redress plan that addressed activities subject to regulation 10 CFR 50.10(d) that became effective November 8, 2007 ([SNC 2008](#)). The revised site redress plan provides reasonable assurance that construction activities conducted under an LWA would be remediated to return the site to an acceptable environmental condition.

In the EIS the NRC determined that site preparation activities addressed in the site redress plan were bounded by environmental effects for construction of the entire project. This assessment remains resolved under the current site redress plan. The EIS did not identify any significant issues that were not resolved. Moreover, having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to the current site redress plan.

4.12 SUMMARY OF CONSTRUCTION IMPACTS

VEGP ESP EIS Chapter 4, Section 4.12 summarizes the effects of constructing two new nuclear units at VEGP and a transmission line.

4.13 REFERENCES

SNC 2008. Southern Nuclear Operating Company, 2008. Vogtle Early Site Permit Application: Environmental Report, Rev. 5. Birmingham, AL. December.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

5.0 STATION OPERATIONAL IMPACTS AT THE PROPOSED SITE

Chapter 5 describes the environmental issues associated with operating two new units at VEGP for an initial 40-year license period. The NRC staff relied on mitigation measures and activities planned by various government agencies in reaching its conclusions regarding the significance of the impacts.

5.1 LAND-USE IMPACTS

VEGP ESP EIS Chapter 5, Section 5.1 described the land-use effects of operating two new units at the VEGP site. Most land use effects would occur offsite as the result of new residents moving to the area to staff the new units. Land-use effects would be SMALL and would not warrant mitigation beyond that identified by SNC. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.2 METEOROLOGICAL AND AIR-QUALITY IMPACTS

VEGP ESP EIS Chapter 5, Section 5.2 described the effects of operating two new units at VEGP on the climate and air quality of the VEGP site and region. Operations effects would result from cooling towers, the infrequent operation of standby diesel generators, and the priority pollutants generated by transmission lines. Effects from all sources would be SMALL and would not require additional mitigation beyond what SNC proposed. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.3 WATER-RELATED IMPACTS

VEGP ESP EIS Chapter 5, Section 5.3 described the effects of surface and groundwater withdrawals and discharges to surface water related to the operation of two new nuclear units at the VEGP site on hydrological processes, water resources, and water quality. NRC analyzed the impacts of the revised cooling water estimate (see Section 3.2.1.1) in the final EIS ([NRC 2008](#)) and concluded that impacts would remain SMALL. The change in blowdown would not alter conclusions regarding the thermal plume in the Savannah River, therefore SNC has not reanalyzed those impacts. Effects would be SMALL and would be limited and regulated through the Georgia Department of Natural Resources National Pollutant Discharge Elimination System (NPDES) permitting process. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.4 ECOLOGICAL IMPACTS

VEGP ESP EIS Chapter 5, Section 5.4 described the effects of operating two new nuclear units at the VEGP site and a new transmission line on terrestrial and aquatic resources, including protected species and wildlife habitat. The NRC concluded that effects on all terrestrial and aquatic resources would be SMALL, and that mitigation beyond what SNC has proposed would not be warranted. SNC believes that increases in evaporation and drift as described in Section 3.2.1.1 would not significantly change the rate of salt deposition or the size or duration of cooling tower plumes, so SNC has not reanalyzed these impacts. The EIS did not identify any

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.5 SOCIOECONOMIC IMPACTS

VEGP ESP EIS Chapter 5, Section 5.5 described the effects of operating two new nuclear units at the VEGP site on socioeconomic conditions. Operations effects on the local economies would be beneficial and SMALL throughout most of the region, and beneficial and MODERATE in Burke County. The effects of tax revenues would be beneficial and SMALL except for property taxes in Burke County which would be beneficial and LARGE. The effects of traffic from the increased workforce would be SMALL. The effects on public services would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.6 HISTORIC AND CULTURAL RESOURCE IMPACTS

VEGP ESP EIS Chapter 5, Section 5.6 described the effects of operating two new nuclear units at the VEGP site and a new transmission line on historic and cultural resources. The NRC concluded that effects to cultural resources would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.7 ENVIRONMENTAL JUSTICE IMPACTS

VEGP ESP EIS Chapter 5, Section 5.7 evaluated the effects of operating two new nuclear units on the health and welfare of minority or low-income populations within the region. The NRC concluded that adverse effects to these populations would be SMALL. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.8 NON-RADIOLOGICAL HEALTH IMPACTS

VEGP ESP EIS Chapter 5, Section 5.8 evaluated the effects of operating two new units at VEGP on the health of the residents in the area and the VEGP workforce. Non-radiological effects would be SMALL, and would not warrant mitigation beyond that proposed by SNC. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

5.9 RADIOLOGICAL IMPACTS OF NORMAL OPERATIONS

VEGP ESP EIS Chapter 5, Section 5.9 described the effects of radiation exposure from normal operations on members of the public, the workforce, and the local biota. Doses to the workforce would be SMALL based on individual doses being maintained within 10 CFR 20.1201 limits. Health effects to members of the public would be SMALL and not observable. Effects to local biota would be SMALL and mitigation would not be warranted. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

5.10 ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS

VEGP ESP EIS Chapter 5, Section 5.10 describes the types of radioactive materials, the paths to the environment, the relationship between radiological dose and health effects, and the environmental effects of reactor accidents. The EIS did not identify any significant issues that were not resolved.

Doses from design-basis accidents presented in the ESP application were updated with information from DCD Rev 17. Site-specific χ/Q s used in the ESP application were identical to those used in this evaluation. Site specific doses were calculated by multiplying the AP1000 DCD Rev 17 dose by the ratio of the site-specific χ/Q value to the DCD χ/Q value. All accident doses remained the same or decreased with the exception of a loss-of-coolant accident. The calculated dose at the EAB from a loss-of-coolant accident increased by 2.86 percent, to 3.6 rem, however, this dose is well below the regulatory criterion of 25 rem (Table 5.10-1).

The severe accidents' baseline cost and dose risk were calculated using the MACCS2 code, which uses SECPOP2000 as an ancillary code. Output from SECPOP2000 provides Year 2000 residential population distribution, and agricultural (e.g., fraction of land used in farming, farm sales) and economic (e.g., farm land property values, non-farm property values) parameters for the 50-mile radius surrounding a proposed site. MACCS2 uses these parameters in the consequence calculations, which, with accident probabilities, produce a risk estimate.

Three issues related to the SECPOP2000 code have recently been identified and publicized throughout the industry: (1) a formatting error in the regional economic data block text file generated by SECPOP2000 results in MACCS2 selecting the wrong data; (2) an error associated with the formatting of the COUNTY97.DAT economic database file used by SECPOP2000 results in SECPOP2000 processing incorrect economic and land use data (essentially SECPOP2000 selects data from the wrong county); and (3) gaps in the numbered entries in the COUNTY97.DAT economic database file results in SECPOP2000 treating any county numbered beyond 955 incorrectly. These issues with SECPOP2000 affect the agricultural and economic parameters input to MACCS2 but not the population distributions.

The published VEGP Units 3 and 4 severe accident analysis includes workarounds for issues (1) and (2), but not the third. However, SNC performed a sensitivity analysis and determined that the resolution of issue (3) would not affect the conclusions of the NRC regarding severe accidents.

The accident analysis presented in the ESP application remains bounding. The environmental consequences of design-basis accidents would be SMALL. The probability-weighted consequences of severe accidents would be SMALL.

Having implemented the process described in Section 1.7.2, SNC identified no new and significant information related to this issue.

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 5.10-1 Doses from Design-Basis Accidents Using Updated Information from DCD Rev. 17

| DCD | | Dose (rem TEDE) | | | | | | |
|---------|--------------------------------------|-----------------|-------------|---|------|------|---|----------------------------------|
| Section | Accident | EAB | | | LPZ | | | Regulatory Criteria ^a |
| | | ESP | COL | Percent Difference ((COL-ESP)/ ESP) * 100 | ESP | COL | Percent Difference ((COL-ESP)/ ESP) * 100 | |
| 15.1.5 | Main Steam Line Break | | | | | | | |
| | Pre-Existing Iodine Spike | 0.07 | 0.07 | 0.00 | 0.03 | 0.03 | 0.00 | 25 |
| | Accident-Initiated Iodine Spike | 0.08 | 0.08 | 0.00 | 0.08 | 0.08 | 0.00 | 2.5 |
| 15.2.8 | Feedwater System Pipe Break | | see note | | | | | 2.5 |
| 15.3.3 | Locked Rotor Accident | | | | | | | |
| | No Feedwater | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | 0.00 | 2.5 |
| | Feedwater Available | 0.05 | 0.04 | -20.22 | 0.02 | 0.02 | 0.00 | 2.5 |
| 15.3.4 | Reactor Coolant Pump Shaft Break | | see note | | | | | 2.5 |
| 15.4.8 | Rod Ejection Accident | 0.27 | 0.27 | 0.00 | 0.17 | 0.17 | 0.00 | 6.3 |
| 15.6.2 | Small Line Break Outside Containment | 0.16 | 0.15 | -6.25 | 0.03 | 0.03 | 0.00 | 2.5 |
| 15.6.3 | Steam Generator Tube Rupture | | | | | | | |

**Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report**

Table 5.10-1 Doses from Design-Basis Accidents Using Updated Information from DCD Rev. 17 (Continued)

| | | | | | | | | |
|--|---------------------------------|------|------|--------|------|------|--------|-----|
| | Pre-Existing Iodine Spike | 0.17 | 0.16 | -5.88 | 0.04 | 0.04 | 0.00 | 25 |
| | Accident-Initiated Iodine Spike | 0.08 | 0.08 | 0.00 | 0.02 | 0.02 | 0.00 | 2.5 |
| 15.6.5 | Loss-of-Coolant Accident | 3.5 | 3.6 | 2.86 | 1.5 | 1.5 | 0.00 | 25 |
| 15.7.4 | Fuel Handling Accident | 0.52 | 0.38 | -26.92 | 0.10 | 0.07 | -30.00 | 6.3 |
| <p>Note - Feedwater System Pipe Break is bounded by Main Steam Line Break. Reactor Coolant Pump Shaft Break is bounded by Locked Rotor Accident. All doses are within the acceptance criteria of NUREG-0800.</p> <p>EAB = exclusion area boundary LPZ = low population zone TEDE = total effective dose equivalent</p> <p>^a 10 CFR 50.34(a)(1), 10 CFR 100.21 or NUREG-1555 criterion</p> | | | | | | | | |

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

5.11 MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING OPERATION

VEGP ESP EIS Chapter 5, Section 5.11 summarizes the measures and controls SNC would invoke to ensure that effects of operations are minimized. The EIS did not identify any significant issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic. [Part 10](#) of the COLA is a draft environmental protection plan that identifies proposed conditions, monitoring, reporting, and record keeping for environmental data during operations.

5.12 SUMMARY OF OPERATIONAL IMPACTS

VEGP ESP EIS Chapter 5, Section 5.12 summarizes the effects of operating two new nuclear units at VEGP and a transmission line.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

6.0 FUEL CYCLE, TRANSPORTATION, AND DECOMMISSIONING

Chapter 6 addresses the environmental effects from the uranium fuel cycle and solid waste management; the transportation of radioactive material; and the decommissioning of two new nuclear units at the VEGP site.

6.1 FUEL CYCLE IMPACTS AND SOLID WASTE MANAGEMENT

VEGP ESP EIS Chapter 6, Section 6.1 concluded that the environmental effects of the uranium fuel cycle to produce fuel for the two new units at VEGP would be SMALL and that mitigation would not be warranted. The EIS did not identify any significant environmental issues that were not resolved. Having implemented the process described in [Section 1.7.2](#) SNC identified no new and significant information related to this topic.

6.2 TRANSPORTATION IMPACTS

VEGP ESP EIS Chapter 7, Section 7.4 concluded that the environmental effects of transporting construction materials, personnel, and fuel to and from VEGP, and radioactive wastes from the site, would be SMALL and consistent with effects associated with those activities at existing nuclear sites. The EIS did not identify any significant environmental issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

6.3 DECOMMISSIONING

VEGP ESP EIS Chapter 6, Section 6.3 concluded that regulatory requirements for decommissioning activities would limit the effects of decommissioning to SMALL impacts. The EIS did not identify any significant environmental issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC identified no new and significant information related to this topic.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

7.0 CUMULATIVE IMPACTS

Chapter 7 evaluates the effects of the proposed action, the construction and operation of two new nuclear units at the VEGP site combined with other past, present, and reasonably foreseeable future actions in the vicinity to determine the magnitude of the cumulative impacts.

7.1 LAND USE

VEGP ESP EIS Chapter 7, Section 7.1 addresses cumulative impacts to land use. The EIS did not identify any significant environmental issues that were not resolved. The NRC concluded that the cumulative impacts to land use would be the result of the effects of construction combined with the effects of new home or business construction generated by the construction workforce at VEGP. The NRC concluded that cumulative impacts would be SMALL and that additional mitigation would not be warranted. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.2 AIR QUALITY

VEGP ESP EIS Chapter 7, Section 7.2 addresses cumulative impacts to air quality. The EIS did not identify any significant environmental issues that were not resolved. The NRC concluded that the cumulative impacts to air quality would be the result of the cumulative emission of the four nuclear plants, the Wilson combustion turbine plant, and operations at the Savannah River Site (SRS), across the Savannah River from VEGP. The NRC concluded that cumulative impacts would be SMALL and would not warrant additional mitigation. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.3 WATER USE AND QUALITY

VEGP ESP EIS Chapter 7, Section 7.3 addresses cumulative impacts to water use and quality. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative impacts of consumptive use of surface water from the Savannah River by four units at VEGP, the SRS, and the Urquhart Power Station near the VEGP site, and determined that the effects would be SMALL and not warrant mitigation. The NRC also evaluated cumulative impacts to groundwater caused by four units at VEGP, saltwater intrusion in Georgia's coastal counties, the presence of tritium in the water table aquifer, and groundwater contamination under the SRS, and determined that the effects would be SMALL and not warrant additional mitigation. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.4 TERRESTRIAL ECOSYSTEM

VEGP ESP EIS Chapter 7, Section 7.4 addresses cumulative impacts to terrestrial ecosystems. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative impacts of construction at the VEGP site, construction of the new transmission line, and operation of cooling towers on wildlife and wildlife habitats. No activities near the site that have or would be likely to have similar effects were identified. No activities in the area of the proposed transmission line that would significantly affect wildlife or wildlife habitats were identified. The NRC concluded that cumulative impacts to terrestrial ecosystems

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

would be SMALL and would not require additional mitigation. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.5 AQUATIC ECOSYSTEM

VEGP ESP EIS Chapter 7, Section 7.5 addresses cumulative impacts to aquatic ecosystems. EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative impacts of activities that occur or could occur on the Savannah River from upstream of VEGP to the mouth of the Savannah River. The staff considered cumulative impacts of four units at VEGP, activities at the SRS that discharge to the Savannah River, and anthropogenic activities that are not directly related to VEGP or the Savannah River. The major factors that would affect cumulative impacts are adequate water flow past the industrial facilities and maintenance of adequate freshwater flow in the lower river. The amount of VEGP's consumptive use and the high degree of regulation of water flow in the river led the NRC staff to conclude that cumulative impacts would be SMALL and would not warrant additional mitigation. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.6 SOCIOECONOMICS, HISTORIC AND CULTURAL RESOURCES, ENVIRONMENTAL JUSTICE

VEGP ESP EIS Chapter 7, Section 7.6 addresses cumulative impacts to socioeconomics, historic and cultural resources, and environmental justice. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative socioeconomic effects of construction and operation at the VEGP site and the construction of the Mixed Oxide Fuel Fabrication (MOX) facility at SRS, the only other major construction project identified in the area/time frame considered in the EIS, and concluded that adverse effects to socioeconomics and environmental justice would be SMALL and would not warrant additional mitigation. Since the publication of the EIS, Congress enacted the American Recovery and Reinvestment Act which will fund two additional construction projects at SRS, and create approximately 3,000 additional jobs at SRS, most of which will be temporary and will terminate in 2011. Construction at VEGP will be ramping up in 2011, so SNC does not expect additional socioeconomic impacts to the region of influence because of the additional construction projects at SRS. Because cultural resources are non-renewable, the cumulative impacts of VEGP and other construction activities in the area would have MODERATE impacts on them. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.7 NON-RADIOLOGICAL HEALTH

VEGP ESP EIS Chapter 7, Section 7.7 addresses cumulative impacts to nonradiological health. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative effects of construction and operation of Units 3 and 4 and the operation of Units 1 and 2, on the potential for adverse effects from thermophilic organisms and on industrial accident rates. The NRC concluded that two new units are not likely to increase the population of thermophilic organisms, and that risks of industrial accidents are expected to remain below average U.S. industrial rates. Cumulative impacts would be SMALL and additional mitigation would not be warranted. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

7.8 RADIOLOGICAL IMPACTS OF NORMAL OPERATIONS

VEGP ESP EIS Chapter 7, Section 7.8 addresses cumulative impacts to radiation doses. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative impacts of the operation of four units at VEGP; the SRS, including the new MOX facility; Chem-Nuclear (now known as EnergySolutions, Inc.); Starmet; and area hospitals. The NRC concluded that cumulative impacts would be SMALL. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.9 SEVERE ACCIDENTS

VEGP ESP EIS Chapter 7, Section 7.9 addresses cumulative impacts from severe accidents. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative risks of accidents at four reactors, which is the sum of the independent risks for each reactor. The NRC concluded that cumulative impacts would be SMALL and additional mitigation is not warranted. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.10 FUEL CYCLE, TRANSPORTATION, DECOMMISSIONING

VEGP ESP EIS Chapter 7, Section 7.10 addresses cumulative impacts to the fuel cycle, transportation, and from decommissioning. The EIS did not identify any significant environmental issues that were not resolved. The NRC evaluated the cumulative effects of additional nuclear fuel manufacturing and determined that the cumulative impacts of the fuel cycle would be SMALL and would not warrant additional mitigation. The NRC evaluated the cumulative impacts of additional shipments of fuel and materials to and from the VEGP site, both for dose to transportation workers and the public along the transportation routes and for highway accidents and concluded that cumulative impacts would be SMALL and additional mitigation is not warranted. The NRC determined that the cumulative impacts of decommissioning would be SMALL and additional mitigation would not be warranted. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

7.11 NRC STAFF CONCLUSIONS AND RECOMMENDATIONS

NRC concluded that the potential for cumulative impacts resulting from construction and operations of VEGP Units 3 and 4 would be SMALL, and additional mitigation is not warranted. The EIS did not identify any significant environmental issues that were not resolved. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

8.0 NEED FOR POWER

During the preparation of the VEGP ESP EIS, NRC staff reviewed the Georgia Power Company's 2007 Integrated Resource Plan (IRP; GPC 2007), which included a need for power determination, and determined the plan is systematic, comprehensive, subject to confirmation and responsive to forecasting uncertainty. The NRC staff concluded that the GPC's detailed prediction of future load demand is a reasonable basis for planning from 2007 to 2030, and that GPC cannot adequately satisfy a significant portion of that demand load with additional electric purchases from neighboring producers. The NRC reviewed and accepted the Need for Power evaluation contained in the IRP submitted to the Georgia Public Service Commission and concluded that there is a justified Need for Power in the region of interest.

The EIS did not identify any significant environmental issues that were not resolved.

For Revision 1 of the COL application, SNC reviewed GPC's updated IRP (GPC 2008) and determined that the assumptions, analyses, and conclusions presented in the updated IRP are consistent with those presented in the 2007 IRP (GPC 2007).

8.1 DESCRIPTION OF POWER SYSTEM

VEGP ESP EIS Chapter 8, Section 8.1 described the GPC and VEGP co-owners' service areas and customers. The EIS did not identify any required information or analyses that were not resolved.

8.2 POWER DEMAND / INTEGRATED RESOURCE PLANNING

VEGP ESP EIS Chapter 8, Section 8.2 described the objectives of integrated resource planning and the basic steps involved in preparing an integrated resource plan. The EIS did not identify any required information, analyses, or significant environmental issues that were not resolved.

8.3 POWER SUPPLY / INTEGRATED RESOURCE PLANNING IN THE STATE OF GEORGIA

VEGP ESP EIS Chapter 8, Section 8.3 described the mission of the Georgia Public Service Commission, the requirements of the Georgia Integrated Resource Planning Act and the regulatory requirements for preparing an IRP. Although the complete IRP is proprietary, GPC granted the NRC access to the entire 2007 IRP. The NRC reviewed the document in March 2007. The EIS did not identify any required information or analyses that were not resolved.

8.4 ASSESSMENT OF NEED FOR POWER / NRC FINDINGS ON GPC'S IRP

VEGP ESP EIS Chapter 8, Section 8.4 concluded that GPC's IRP and the need for power analysis within it is systematic, comprehensive, subject to confirmation, and responsive to forecasting uncertainty. The NRC also concluded that GPC's future load demand is a reasonable basis for planning for 2007 to 2030, and that GPC cannot expect to satisfy a significant portion of that demand load with additional electric purchases from neighboring producers. The EIS did not identify any required information or analyses that were not resolved.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

8.5 REFERENCES

GPC 2007. Georgia Power Company. 2007. Application for Approval of Its 2007 Integrated Resource Plan; Docket Number 24505-U. Atlanta Ga. January 30, 2007.

GPC 2008. Georgia Power Company 2008. Georgia Power's Application for the Certification of Units 3 and 4 at Plant Vogtle and Updated Integrated Resource Plan. Docket No. 27800-U. Atlanta Ga. August 1, 2008.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

9.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The NRC evaluated alternative energy sources to nuclear, alternative cooling systems to natural draft wet cooling towers, and alternative sites to VEGP. No energy sources or system design alternatives were deemed to have less environmental impact. No alternative site was deemed obviously superior to the VEGP site.

9.1 NO-ACTION ALTERNATIVE

The COL no-action alternative is a scenario in which the NRC would deny the COL request. The following discussion addresses this scenario.

In this scenario, the construction and operation of two additional nuclear units would not occur. The environmental effects of operating the nuclear units described in Chapter 5 of the EIS would not occur. Some effects from construction activities may occur. If so, SNC would restore the site as described in the site redress plan submitted with the ESP application, Rev 5 (SNC 2008). The no-action alternative would result in none of the following benefits ascribed to the COL.

- Meeting future energy needs identified by GPC.
- Maintaining long-term price stability for electricity in the relevant service area.
- Enhancing energy security and fuel diversity.

9.2 ENERGY ALTERNATIVES

VEGP ESP EIS Chapter 9, Section 9.2 evaluated alternatives not requiring new generating capacity, alternatives requiring new generating capacity, and a combination of alternatives. The NRC concluded that, from an environmental perspective, none of the viable energy alternatives is clearly preferable to construction of a new baseload nuclear power generation plant. The EIS did not identify any significant environmental issues that were not resolved.

9.3 SYSTEM DESIGN ALTERNATIVES

VEGP ESP EIS Chapter 9, Section 9.3 evaluated once-through cooling and dry or hybrid wet/dry cooling towers. NRC staff concluded that a wet cooling tower would be preferable to any other cooling system. The EIS did not identify any significant environmental issues that were not resolved.

9.4 REGION OF INTEREST AND ALTERNATIVE SITE SELECTION PROCESS

VEGP ESP EIS Chapter 9, Section 9.4 evaluated SNC's alternative site selection process and concluded that SNC's process for selection of potential and candidate sites was reasonable. The EIS did not identify any significant environmental issues that were not resolved.

9.5 EVALUATION OF ALTERNATIVE SITES

VEGP ESP EIS Chapter 9, Section 9.5 evaluated three alternative sites in detail: Plant Hatch in Appling and Toombs Counties, Georgia; Plant Farley in Houston County, Alabama; and the

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

Barton site, a greenfield site owned by Southern Company in Chilton and Elmore Counties, Alabama. Section 9.5 evaluates independently for each site the effects of construction and operation that could vary among sites. The EIS did not identify any significant environmental issues that were not resolved.

9.6 ISSUES AMONG SITES HANDLED GENERICALLY

VEGP ESP EIS Chapter 9, Section 9.6 evaluated issues among sites handled generically. Section 9.6 evaluated effects that would not vary among sites, and would not affect the evaluation of whether a site was environmentally preferable to the proposed site. The EIS did not identify any significant environmental issues that were not resolved.

9.7 SUMMARY OF ALTERNATIVE SITE IMPACTS

In the VEGP ESP EIS, the NRC evaluated three alternative sites in detail: Plant Hatch in Appling and Toombs Counties, Georgia, Plant Farley in Houston County, Alabama, and the Barton site, a greenfield site owned by Southern Company in Chilton and Elmore Counties, Alabama. Section 9.7 of the ESP EIS summarizes the findings reported in Sections 9.5 and 9.6 in tabular form.

9.8 REFERENCES

SNC 2008. Southern Nuclear Operating Company. 2008. Vogtle Early Site Permit Application: Environmental Report, Rev. 5. Birmingham, AL. December.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

10.0 COMPARISON OF IMPACTS OF THE PROPOSED ACTION AND THE ALTERNATIVE SITES

In Chapter 10 of the VEGP ESP EIS, the NRC compared the environmental effects of the proposed action described in Chapters 4 and 5 to the effects of two new units at alternative sites described in Chapter 9. The EIS did not identify any significant environmental issues that were not resolved.

10.1 COMPARISON OF THE PROPOSED SITE WITH THE ALTERNATIVE SITES

Construction effects for the majority of the environmental categories at most of the sites would be SMALL. Some environmental effects are generic to all sites and do not influence the comparisons among sites: radiological and non-radiological health, postulated accidents, and some aspects of ecology and socioeconomics. Effects associated with transmission lines ranged from SMALL to MODERATE at all sites because of the potential changes to the transmission system at all sites. Land-use effects at the greenfield site would be greater than those at the other alternative sites or the VEGP site. Operations effects on most of the environmental components at most sites would be SMALL. The EIS did not identify any significant environmental issues that were not resolved.

10.2 ENVIRONMENTALLY PREFERABLE SITES

No alternative site was identified as environmentally preferable to the VEGP site. The EIS did not identify any significant environmental issues that were not resolved.

10.3 OBVIOUSLY SUPERIOR SITES

No alternative site was identified as environmentally preferable to the VEGP site; therefore no alternative site is obviously superior. The EIS did not identify any significant environmental issues that were not resolved.

10.4 COMPARISON WITH THE NO-ACTION ALTERNATIVE

The no-action alternative is a scenario in which the NRC denies SNC's request for a combined construction and operating license. As identified below, SNC could follow several paths to satisfy electric power needs. Each would have associated environmental impacts.

- Reapply with a revised application for the same proposed site.
- Seek a COL for a different reactor type and/or a different location.
- Purchase power from other electricity providers.
- Establish conservation and demand-side management programs.
- Construct new generation facilities other than nuclear at the proposed site or at another location.
- Delay retirement of existing generating facilities.
- Reactivate previously retired generating facilities.

Vogle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

11.0 CONCLUSIONS AND RECOMMENDATIONS

In Chapter 11 of the VEGP ESP EIS, the NRC summarized the conclusions and recommendations made throughout the EIS.

11.1 IMPACTS OF THE PROPOSED ACTION

VEGP ESP EIS Chapter 11, Section 11.1 summarized the potential cumulative impacts from construction and operation of Units 3 and 4 at the VEGP site with past, present, and reasonably foreseeable future actions. The EIS did not identify any significant environmental issues that were not resolved. The NRC determined that for each impact area, the cumulative impacts would be SMALL and mitigation would not be warranted. A few impact areas have the potential for MODERATE effects, most of which would be temporary or associated with a larger-than-anticipated construction workforce settling near the site. Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

11.2 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

VEGP ESP EIS Chapter 11, Section 11.2 identified the unavoidable adverse impacts from construction and operation of Units 3 and 4 at the VEGP site (summarized in EIS Tables 11-1 for construction and 11-2 for operations).

The VEGP ESP EIS stated that unavoidable construction effects include the permanent disturbance of 324 acres of land at the VEGP site, and the temporary disturbance of additional areas. The EIS did not identify any significant environmental issues that were not resolved. The revised site plan ([Figure 3.1-1](#)) identifies 376 acres of permanently disturbed land, and 226 acres of temporarily disturbed land. SNC does not consider this new information significant because VEGP is in a rural area adjacent to a 7,800-acre game management area with similar habitats and most of the land that would support construction is previously disturbed and thus not high-quality natural habitat. The increase of 52 acres of permanently disturbed land does not change the NRC's conclusion that impacts would be SMALL.

Other unavoidable adverse impacts of construction include loss of terrestrial habitat, including wetlands; temporary dewatering of the water table aquifer in the vicinity of the construction; increases in local traffic; the potential for a short-term shortage of available housing; doses to construction workers from Units 1 and 2; and emissions from construction equipment.

Unavoidable impacts of operations include the likelihood that some undeveloped land would be converted to housing or retail developments; increased surface and groundwater use; increased use of publicly-funded services such as schools and police and fire protection; and doses to the workers, the public, and biota.

Having implemented the process described in [Section 1.7.2](#), SNC has identified no new and significant information for this issue.

Vogtle Electric Generating Plant, Units 3 & 4
COL Application
Part 3 – Environmental Report

11.3 ALTERNATIVES TO THE PROPOSED ACTION

In VEGP ESP EIS Chapter 11, Section 11.3, the NRC presented their determination that none of the alternative sites is environmentally preferable or obviously superior to the proposed VEGP site. The EIS did not identify any significant environmental issues that were not resolved.

11.4 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE HUMAN ENVIRONMENT

In VEGP ESP EIS Chapter 11, Section 11.4 noted that if Units 3 and 4 are constructed and operated, power production would continue until the expiration of the licenses or until the licensee chooses to cease operations, at which time the reactors would be decommissioned according to NRC regulations. Once decommissioning is complete and the NRC license is terminated, the site would be available for other uses. The EIS did not identify any significant environmental issues that were not resolved.

11.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

In VEGP ESP EIS Chapter 11, Section 11.5 the NRC determined that irretrievable commitments of resources during the construction of Units 3 and 4 at the VEGP site would be similar to those of any large construction project such as concrete, steel, and other building materials. While these construction materials are irretrievable, the quantities used would be of small consequence with respect to the availability of these resources. The main irretrievable resource during operations would be the uranium used as fuel. The EIS did not identify any significant environmental issues that were not resolved.

11.6 BENEFIT-COST BALANCE

In VEGP ESP EIS Chapter 11, Section 11.6 the NRC determined that the potential societal benefits of constructing and operating Units 3 and 4 at the VEGP site are substantial, and that the costs would be relatively low. The EIS did not identify any significant environmental issues that were not resolved.

11.7 NRC STAFF SUMMARY AND CONCLUSIONS

Upon evaluation of this application for a COL, and an independent analysis of the impacts of such an activity, the NRC staff will make a recommendation to the Commission on the advisability of issuing the COL to SNC.