CHAPTER 1, INTRODUCTION

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1.0 INTRODUCTION

1.1 THE PROPOSED PROJECT

In accordance with the provisions of 10 CFR 52, Subparts B (Standard Design Certifications) and C (Combined Licenses), and supporting guidance, SCE&G has developed an application to the U.S. NRC for a combined operating license (COL). The COL represents NRC's approval of a site for construction and conditional operation of two nuclear power facilities. The SCE&G COL application is for the VCSNS site in Fairfield County, South Carolina. In accordance with NRC regulations, SCE&G has included in its application this ER. The ER analyzes impacts to the environment from constructing, operating, and decommissioning two additional nuclear power facilities at this site. The NRC will use the ER as input to meet the National Environmental Policy Act of 1969 (NEPA) (42 *United States Code* [U.S.C.] 4321-4347, January 1, 1970, as amended) requirement that federal agencies consider the impacts that their actions, such as license issuance, might have on the environment.

1.1.1 PURPOSE AND NEED

The proposed action is NRC issuance of a COL to SCE&G for the additional nuclear power facilities. A COL authorizes construction and conditional operation of a nuclear power facility. The NRC ensures the licensee has completed the required inspections, tests, and analyses and authorizes operation after finding that the licensee has met the acceptance criteria. The purpose and need for the proposed action (NRC issuing a COL) is to provide, as an option, authorization for construction and operation of two nuclear power facilities to meet future generating needs for baseload power as such needs may be determined by state and owner decision makers.

The underlying reason for this need is that, while states retain authority over the types of electric generation that will be constructed and operated within their borders, states (and facility owners) cannot include nuclear power in their generation mix without federal (NRC) approval of the construction and operation of a nuclear generation facility. Conversely, NRC approval gives the state a generation option that the state may or may not exercise, at its discretion.

1.1.2 PROJECT DESCRIPTION

This section provides a brief summary of project information that subsequent sections, particularly Chapter 3, Plant Description, describe in detail.

1.1.2.1 The Applicant and Owners

The proposed COL is a joint project between SCE&G and the South Carolina Public Service Authority (commonly referred to as "Santee Cooper"). The proposed units would be jointly owned by SCE&G (55%) and Santee Cooper (45%), and operated by SCE&G. SCE&G is the principal subsidiary of SCANA Corporation, an energy-based holding company with headquarters in Columbia,

South Carolina. Santee Cooper is South Carolina's state-owned electric and water utility, with corporate headquarters in Moncks Corner, South Carolina. SCE&G has been authorized by Santee Cooper to act as their agent in applying for a COL for the VCSNS site. The proposed units would be state-regulated (that is, not merchant units).

The SCE&G COL application, Part 1, "*Administrative Information*," Section 1.3, provides additional information about SCE&G and Santee Cooper.

1.1.2.2 Site Location

The VCSNS site is located in Fairfield County, South Carolina, approximately 15 miles west of the county seat of Winnsboro and 26 miles northwest of Columbia, the state capital (Figure 2.1-2). The site is in a sparsely populated, largely rural area, with forests and small farms comprising the dominant land use. The Broad River flows in a northwest-to-southeast direction approximately 1 mile west of the site and serves as the boundary between Fairfield County (to the east) and Newberry County (to the west). The new plant footprint is located south of VCSNS Unit 1 and is generally the area that was used for laydown of construction materials and the source of borrow material during the construction of Unit 1. The proposed site encompasses the Old Steam Generator Recycle Facility and the proposed independent spent fuel storage installation (ISFSI) for VCSNS. The ISFSI is not part of this license application. ER Section 2.1, "Site Location," provides additional information about the site location.

1.1.2.3 Reactor Information

SCE&G proposes to build and operate two new Westinghouse AP1000 advanced light water reactors at the VCSNS site. The NRC has approved the DCD for the AP1000 (Westinghouse 2005). The final design certification rule was issued in 71 FR 4464 on January 27, 2006. A revised final design approval (FDA), based on Revision 15 of Westinghouse's DCD was issued March 10, 2006 [see notice of issuance in the FR at 71 FR 13870]. This FDA allows the AP1000 design to be referenced in a COL application under 10 CFR Part 52. Westinghouse has submitted two later applications to amend the design certification rule. SCE&G used these subsequent revisions to the AP1000 DCD, Revision 16 (Westinghouse 2007) and Revision 17 (Westinghouse 2008) as the basis for the analyses in this ER. The AP1000 has a thermal power rating of 3,400 MWt with a net electrical output of approximately 1,107 MWe. ER Section 3.2, "Reactor Power Conversion System," describes the AP1000 in detail.

1.1.2.4 Cooling System Information

Each new unit would use a recirculating cooling water system that would include two mechanical draft cooling towers. A new shoreline intake structure would supply cooling tower makeup water from the Monticello Reservoir to the new units. A common line for the new units would be constructed to discharge cooling tower blowdown effluent to the Parr Reservoir. ER Section 3.4, "Cooling System," provides additional details.

1.1.2.5 Transmission System Information

The Unit 1 switchyard interconnects with the regional power grid via 10 existing 230kV transmission lines. SCE&G has assumed the addition of six new 230kV transmission lines: three for Unit 2 and three for Unit 3, to handle the additional generation capacity to the electric grid. Specific routing of the new transmission lines is not known at this time; however, the ER does identify potential impacts to land uses and protected species in the counties that the lines could cross. Subsequent to the submittal of the COL application to the NRC on March 27, 2008, SCE&G and Santee Cooper conducted siting area studies to identify routes for new transmission lines (SCE&G 2008; Santee Cooper 2008). Santee Cooper has determined the final routing and evaluated the associated environmental impacts for their new transmission lines in Santee Cooper 2008. Similarly, SCE&G has identified the potential routes for their new transmission lines as noted in SCE&G 2008. The primary goal of the SCE&G siting study was to provide a reasonable estimate and evaluation of the magnitude of impacts that would likely result from construction of the lines within the bounds of those potential routes. The comprehensive process to select final, surveyed routes has been initiated. SCE&G is fully confident, based upon many years of experience with many transmission line projects and intimate familiarity with the terrain, that it is reasonable to conclude that the effects associated with the final routes for the new lines will be bounded by the effects that are presented in the siting study for the potential routes. ER Sections 2.2.2, *Transmission Corridors and Offsite Areas*, and 3.7, “Power Transmission System,” provide additional details. Both SCE&G and Santee Cooper are vertically integrated companies and own and operate their transmission systems.

1.1.2.6 Pre-Application Public Involvement

SCE&G plans to continue conducting a public outreach effort in conjunction with preparing the COL application. This effort began with SCE&G’s announcing selection of the VCSNS site and AP1000 reactor in February 2006. SCE&G continues to provide informal public outreach through making presentations to civic and business groups; distributing fact sheets, brochures, and news releases; and conducting site tours. SCE&G has also initiated a dialogue with its internal stakeholders (employees of VCSNS, investors, and stockholders). SCE&G does not plan to conduct formal public meetings associated with the COL application. NRC may hold public outreach meetings to provide information to the public on the COL application review process, including information on opportunities for public involvement in that process for the VCSNS site.

1.1.2.7 Construction Start Date

NRC regulations allow COL applicants to conduct certain activities described in 10 CFR 50.10 before the COL is issued. SCE&G plans to start such activities, including site preparation, no later than October 2008 and estimates that they would take 30 months to complete. Construction of Unit 2 would begin following the site preparation for both units. SCE&G expects to initiate construction of both units in April 2011. SCE&G estimates that construction would occur over an

89-month period, beginning in April 2011, shortly after NRC approval of the COL application (estimated in February 2011), and ending with the initial fuel load for Unit 3 in September 2018. Commercial operation would begin approximately 8 months after fuel load for Unit 2, and 4 months after fuel load for Unit 3. ER Section 3.9, “Construction Activities,” provides additional details.

1.2 STATUS OF REVIEWS, APPROVALS, AND CONSULTATIONS

SCE&G has divided its discussion of the status of federal, state, and local environmental protection licenses, permits, reviews, approvals, and consultations, collectively called authorizations, by project phase (that is, COL issuance, preconstruction, construction, and operation). Tables 1.2-1 through 1.2-4 identify, for each authorization, the following information:

- Jurisdictional agency
- Authority, law, or regulation that dictates the requirement
- Name of the required authorization
- License or permit number as applicable
- Expiration date of any existing licenses or permits
- Description of the requirements to be fulfilled by the applicant before issuance of the authorization

Authorizations for previously initiated and ongoing activities were captured in the table associated with the initiation of the work activity, and were not repeated in subsequent tables. Except for existing VCSNS permits, SCE&G has not received any other necessary authorizations; therefore, the columns for permit numbers and expiration dates have been left blank. SCE&G would apply for and receive any required authorizations before initiating the affected activity. The following sections describe the activities to be authorized.

1.2.1 COMBINED OPERATING LICENSE ISSUANCE

Table 1.2-1 lists authorizations required before NRC issues a COL. Four authorizations are consultations that NRC must undertake in accordance with the following statutes:

- *Endangered Species Act of 1973* (16 U.S.C. 1531-1544, December 28, 1973, et seq., as amended)—The *Endangered Species Act of 1973* requires federal agencies to ensure that agency action is not likely to jeopardize any species that is listed or proposed for listing as endangered or threatened. Depending on the action involved, the Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) regarding effects on non-marine species, the National Marine Fisheries Service (NMFS) for marine species, or both. Because of the potential for anadromous species to move from the Atlantic Ocean to the Broad River in the vicinity of the VCSNS site, SCE&G concluded that the NRC would consult with the USFWS and the NMFS. In addition, as a matter of policy, the NRC consults with states regarding state-protected species.

- *National Historic Preservation Act of 1966* (16 U.S.C. 470)—The *National Historic Preservation Act of 1966* requires federal agencies having the authority to license any undertaking to, before issuing the license, take into account the effect of the undertaking on historic properties and to afford the Advisory Committee on Historic Preservation an opportunity to comment on the undertaking. Committee regulations provide for establishing an agreement with any state historic preservation officer (SHPO) to substitute state review for Committee review (36 CFR 800). SCE&G concludes that the NRC would have to consult with the South Carolina SHPO.

- Clean Water Act (33 U.S.C. 1251, et seq.)—The *Federal Water Pollution Control Act of 1948*, also known as the Clean Water Act (CWA), Section 401, requires applicants for a federal license, if conducting an activity that might result in a discharge into navigable waters, to provide the licensing agency a certification from the state that the discharge would comply with applicable CWA requirements (33 U.S.C. 1341). SCE&G would obtain certification from the South Carolina Department of Health and Environmental Control (SCDHEC), where applicable, and submit it to the NRC.

1.2.2 PRECONSTRUCTION ACTIVITIES

Preconstruction activities are those that may be undertaken before a COL or Limited Work Authorization (LWA) is issued. Pursuant to 10 CFR 50.10(c), “No person may begin the construction of a production or utilization facility on a site on which the facility is to be operated until that person has been issued either a construction permit under this part, a combined license under part 52 of this chapter, an ESP authorizing the activities under paragraph (d) of this section, or a LWA under paragraph (d) of this section.” NRC regulations at 10 CFR 50.10(a) define activities that are considered to be construction, and those activities that are not. Activities not defined as construction may be initiated without prior NRC authorization.

As noted in Subsection 1.1.2.7, SCE&G would begin certain activities before the COL is issued. These activities include:

- Site exploration, including necessary borings to determine foundation conditions or other preconstruction monitoring to establish background information related to the suitability of the site, the environmental impacts of construction or operation, or the protection of environmental values.

- Preparation of a site for construction of a facility, including clearing of the site, grading, installation of drainage, erosion and other environmental mitigation measures, and construction of temporary roads and borrow areas.

- Erection of fences and other access control measures.

- Excavation.
- Erection of support buildings (such as construction equipment storage sheds, warehouse and shop facilities, utilities, concrete mixing plants, unloading facilities, and office buildings) for use in connection with the construction of the facility.
- Building of service facilities, such as paved roads, parking lots, railroad spurs, exterior utility and lighting systems, potable water systems, sanitary sewerage treatment facilities, and transmission lines.

In 2006, SCE&G conducted site exploration activities under the existing VCSNS plant permitting process as allowed by 10 CFR 50.10(b)(1) as it existed at that time.[a]

These site exploration activities included:

- Sampling core drills and installing monitoring wells or additional geophysical borings.
- General site cleanup activities and protection of the existing historical site.
- Erection of a new meteorological tower.

Table 1.2-2 identifies authorizations required before preconstruction activities begin.

1.2.3 CONSTRUCTION ACTIVITIES

Pursuant to 10 CFR 50.10(d)(1), “Any person to whom the Commission may otherwise issue either a license or permit under Sections 103, 104.b, or 185 of the Act for the type specified in § 50.21(b)(2) or (3), § 50.22, or a testing facility, may request a LWA allowing that person to perform the driving of piles, subsurface preparation, placement of backfill, concrete, or permanent retaining walls within an excavation, installation of the foundation, including placement of concrete, any of which are for structures, systems, and components of the facility for which either a construction permit or combined license is otherwise required under paragraph (c) of this section."

At its discretion, SCE&G may seek authorization to perform construction activities authorized under 10 CFR 50.10(d) and to seek issuance of an LWA. An LWA addresses construction activities that are safety-related, commonly referred to as LWA activities. Pursuant to 10 CFR 51.49(a), COL applicants may request LWA authorization by submitting a separate document, titled, “Applicant’s Environmental Report – Limited Work Authorization Stage.” The NRC would grant

a. It should be noted that the LWA regulations have changed during the application development.

such authorization only after making a determination that no unresolved safety issue relates to the LWA activities. In addition, this application would include a site redress plan as required by 10 CFR 50.10(d)(3).

Table 1.2-3 lists authorizations required before construction activities begin. SCE&G could not initiate these activities before obtaining the LWA or COL.

1.2.4 OPERATION

Table 1.2-4 lists authorizations required before operation begins.

Table 1.2-1
Authorizations Required for Combined Operating License Issuance

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
USFWS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	(a)		Concurrence with no adverse impact or consultation on appropriate mitigation measures
SCDNR	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	(a)		Concurrence with no adverse impact or consultation on appropriate mitigation measures
NMFS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (marine species)	(a)		Concurrence with no adverse impact or consultation on appropriate mitigation measures
South Carolina Department of Archives and History	National Historic Preservation Act (36 CFR Part 800)	Consultation regarding potential to adversely affect historic resources	(a)		Confirm site construction or operation would not affect protected historic resources
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC R.61-101 Water Quality Certification	Section 401 Certification	(a)		Compliance with water quality standards
DOE	Nuclear Waste Policy Act (42 U.S.C. 10101 et seq.) and 10 CFR Part 961	Spent fuel contract	Unit 2 – DE-CR01-09RW09014 Unit 3 – DE-CR01-09RW09015	N/A	Contract for DOE disposal services for spent nuclear fuel

(a) No permits have been issued.
SCDNR – South Carolina Department of Natural Resources
DOE – Department of Energy

Table 1.2-2 (Sheet 1 of 2)
Authorizations Required for Preconstruction Activities

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
USACE	CWA (33 U.S.C. 1251 et seq.)	Section 404 Permit	(a)		Disturbance or crossing wetland areas or navigable waters
USDOT	49 FR 107, Subpart G	Certificate of Registration	(a)		Transportation of hazardous materials
USFWS	Migratory Bird Treaty Act, 50 CFR Part 21	Federal Depredation permit	MB040209-0	March 31, 2009	Adverse impacts on protected species and/or their nests
FAA	49 U.S.C. 1501 14 CFR Part 77	Construction Notice	(a)		Notice of erection of structures (>200 feet high) potentially affecting air navigation
FERC	Federal Power Act (16 U.S.C. 791a-825r) 18 CFR 4.200	License/order revision	Project 1894	June 30, 2020	Use of Monticello Reservoir as water source for Units 2 and 3 and discharge of blowdown to Parr Reservoir
PSC	SC Utility Facility Siting and Environmental Protection Act, SC Code of Laws Title 58, Ch. 33	Certificate of Environmental Compatibility and Public Convenience and Necessity		(Application filed May 30, 2008)	Present and future public convenience and necessity require the operation of such equipment or facility
SCDNR	Nongame and Endangered Species and Conservation Act (SC Code of Laws, Title 50, Ch. 15), SC R.123-50	State Depredation permit	MD-08-01	December 31, 2008	Adverse impacts on protected species and/or their nests
SCDHEC	Federal Clean Air Act (CAA), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC Air Pollution Control Regulations and Standards (SC R. 61-62)	Bureau of Air Quality Construction Permit	(a)		Construction air emission sources (*e.g.,* concrete batch plant, portable generators)
SCDHEC	Federal Clean Air Act Amendments Title V, SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R. 61-62.70 “Title V Operating Permit Program”	Revision of existing conditional major operating permit	CM-1000-0012	March 31, 2010	Operation of air emission sources
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-9 “Water Pollution Control Permits”	Revision of existing National Pollutant Discharge Elimination System (NPDES) permit	SC0030856	July 31, 2012	Regulates limits of pollutants in liquid discharge to surface water
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-9	Authorization to discharge under the general NPDES permit for storm water discharges associated with construction activity	SCR100000	August 31, 2011	Discharge of storm water associated with large construction activities (>5 acres)
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-9	Storm Water Pollution Prevention Plan (SWPPP)	SCR100000	August 31, 2011	Discharge of storm water associated with large construction activities (>5 acres)

Table 1.2-2 (Sheet 2 of 2)
Authorizations Required for Preconstruction Activities

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
SCDHEC	SC Safe Drinking Water Act (SC Code of Laws, Title 44, Ch. 55), SC R.61-58	Permit to construct/operate a public water system	(a)		Construct and operate a public, non-transient, noncommunity water system
SCDHEC	Clean Water Act (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-67	Wastewater facility construction permit	(a)		Construction of wastewater transportation and treatment facilities
SCDHEC	SC R.61-71	Certification of monitoring well approval and/or abandonment	2624	N/A	Abandonment (fill, plug, and seal) of test wells
SCDOT	SC R.63-370 "Private Driveway entrances to Highways"	Permit for encroachment on state highway right-of-way	61919	September 11, 2009	Construction of access road within the right-of-way of public roadways; improvements to Parr Road
Fairfield County	Local ordinance	Construction permit	(a)		Construction of facilities

(a) No permits have been issued.

CAA - Clean Air Act
CWA - Clean Water Act
FAA - Federal Aviation Administration
FERC - Federal Energy Regulatory Commission
PSC - Public Service Commission
SCDOT - South Carolina Department of Transportation
USACE - U.S. Army Corps of Engineers

Table 1.2-3
Authorizations Required for Construction Activities[a]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
NRC	10 CFR Part 52, Subpart C	COL	(b)		Safety-related construction for a nuclear power facility.
NRC	10 CFR 50.10(d)(1)	LWA	(b)		Safety-related construction activities (driving of piles, subsurface preparation, placement of backfill, concrete, or permanent retaining walls within an excavation, installation of the foundation, including placement of concrete). The LWA is at the applicant's discretion.
FAA	49 U.S.C. 1501 14 CFR Part 77	Construction Notice	(b)		Notice of erection of structures (>200 feet high) potentially impacting air navigation.
USACE	CWA	Section 404 Permit	(b)		Disturbance or crossing wetland areas or navigable waters associated with transmission line corridors.
USFWS	Migratory Bird Treaty Act, 50 CFR Part 21	Federal Depredation Permit	MB040209-0	March 31, 2009	Adverse impacts on protected species and/ or their nests associated with transmission line corridors.
SCDNR	Nongame and Endangered Species and Conservation Act, (SC Code of Laws, Title 50, Ch. 15), SC R.123-50	Depredation permit	MD-08-01	December 31, 2008	Adverse impacts on state- designated protected species and/or their habitat associated with transmission line corridors.
SCDHEC	CAA, SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC Air Pollution Control Regulations and Standards (SC R. 61-62)	Bureau of Air Quality Construction Permit	(b)		Construction air emission sources.
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-9	Authorization to discharge under the general NPDES permit for storm water discharges associated with construction activity	SCR100000	August 31, 2011	Discharge storm water from linear construction sites (*e.g.,* transmission lines) during construction.
Fairfield County	Local ordinance	Construction permit	(b)		Construction of facilities.
Various county offices responsible for land disturbing activities	Bamberg, Calhoun, Charleston, Chester, Colleton, Dorchester, Fairfield, Hampton, Lancaster, Lexington, Orangeburg, and Richland County ordinances	Land-Disturbing Activity Permit	(b)		Land-disturbing activities within county boundaries for transmission line corridors.
SCDOT	23 CFR 1.23	Permit	(b)		Utility right-of-way easement.

(a) Assumes that SCE&G obtained the authorizations that Table 1.2-2 identifies.
(b) No permits have been issued.

Table 1.2-4
Authorizations Required for Operation[a]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
NRC	10 CFR Part 70	Special nuclear materials license	[b]		Possession of fuel.
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Laws 1976, Title 48, Ch. 1), SC R.61-9 "Water Pollution Control Permits"	Revision of existing NPDES permit	SC0030856	July 31, 2012	Regulates limits of pollutants in liquid discharge to surface water.
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Laws 1976, Title 48, Ch. 1), SC R.61-62.70 "Title V Operating Permit Program"	Revision of existing Conditional Major Operating Permit	CM-1000-0012	March 31, 2010	Operation of air emission sources.
SCDHEC	South Carolina Surface Water Withdrawal and Reporting Act (SC Code of Laws, Title 49, Ch. 4)	Registration and reporting of surface water withdrawal	[b]		Withdrawal of water from the Monticello Reservoir for cooling makeup and in-plant use.
SCDHEC	CWA (33 U.S.C. 1251 et seq.), SC Pollution Control Act (SC Laws 1976, Title 48, Ch. 1), SC R.61-9	Authorization to discharge under the general NPDES permit for storm water discharges associated with industrial activity	[b]		General permit to discharge storm water from site during operations.
SCDHEC	Atomic Energy and Radiation Control Act (SC Code of Laws, Title 13, Ch. 7), SC R.61-63	Radioactive materials license	[b]		Receipt and use of radioactive materials.
SCDHEC	South Carolina Radioactive Waste Transportation and Disposal Act (Act No. 429 of 1980), SC R. 61-83 "Transportation of Radioactive Waste Into or Within South Carolina"	Revision of existing South Carolina Radioactive Waste Transport Permit	0163-39-07	December 31 of each year (renewable)	Transportation of radioactive waste within the state of South Carolina.
TDEC	TDEC Division of Radiological Health Rule 1200-2-10.32 "Licensing of Shippers of Radioactive material into or within Tennessee"	Revision of existing Tennessee Radioactive Waste License-for-Delivery	T-SC001-L07	December 31 of each year (renewable)	Transportation of radioactive waste into the state of Tennessee.

(a) Assumes that SCE&G obtained the authorizations that Tables 1.2-2 and 1.2-3 identify.
(b) No permits have been issued.
TDEC – Tennessee Department of Environment and Conservation

1.3 METHODOLOGY

For COL applications that do not refer to an early site permit, NRC regulation 10 CFR 52.79(a)(2) requires an ER be prepared in accordance with the provisions of Subpart A of 10 CFR Part 51. Regulatory Guide 1.206, *Combined License Applications for Nuclear Power Plants (LWR Edition)* (U.S. NRC 2007) suggests that NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (U.S. NRC 1999a), Regulatory Guide 4.2, *Preparation of Environmental Reports for Nuclear Power Stations* (U.S. NRC 1976), and NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (U.S. NRC 1996, 1999b), provide guidance to applicants preparing ERs for nuclear power stations.

NUREG-1555 provides guidance for NRC staff to use when conducting environmental reviews of applications related to nuclear power plants. Because Regulatory Guide 4.2 is an earlier NRC document and NUREG-1555 is relatively new, SCE&G chose to look to the latter for guidance in establishing the format and content of its ER. SCE&G has provided additional information and organization in the material presented, as deemed appropriate, when applying lessons learned from early site permit applicants (U.S. NRC 2006a; 2006b; and 2006c). SCE&G prepared Table 1.3-1 to verify conformance with regulatory requirements. The table identifies each requirement and indicates where in the ER SCE&G has responded to the requirement.

SCE&G also considered the conclusions of NUREG-1437 for input in assessing the impacts of Units 2 and 3 on the site. SCE&G concluded that if characteristics of the proposed AP1000 reactors are similar to those of the existing fleet, NUREG-1437 environmental issues, significance determination criteria, and significance conclusions could be applied in the COL environmental review. SCE&G has indicated in its ER where it has used NUREG-1437 in assessing environmental impacts for the proposed reactors at the VCSNS site.

In addition to Regulatory Guide 4.2, there are 17 other Division 4 Regulatory Guides that could potentially impact this ER. In most cases, these Regulatory Guides either do not apply or are more applicable to plant operation than to preparing an ER. Accordingly, most of these Regulatory Guides did not affect the ER. An accounting of how these Regulatory Guides affected the ER is presented in Table 1.3-2.

Chapter 1.0 References

1. FERC (Federal Energy Regulatory Commission). (16 U.S.C. 791a-825r) and 18 CFR 4.200.

2. Santee Cooper 2008. *V. C. Summer Nuclear Station Units 2 and 3 Transmission Line Siting Study Santee Cooper*. Moncks Corner, South Carolina, Prepared by MACTEC Engineering and Consulting, Inc. Columbia, South Carolina, August 25, 2008.

3. SCE&G 2008. *V. C. Summer Nuclear Station Units 2 and 3 Transmission Line Siting Study SCE&G*. Columbia, South Carolina, Prepared by Facilities Planning & Siting, PLLC, Charlotte, North Carolina, August 2008.

4. U.S. EPA. *National Environmental Policy Act of 1969,* Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), September 13, 1982.

5. U.S. EPA. *Federal Water Pollution Control Act,* otherwise known as the Clean Water Act of 1948, 33 U.S.C. 1251, et seq., as amended.

6. U.S. DOI (U.S. Department of the Interior). *Protection of Historic Properties,* 36 CFR Part 800, 51 FR 31118, September 2, 1986; 52 FR 25376, July 7, 1987.

7. U.S. DOI. *National Historic Preservation Act of 1966,* 16 U.S.C. 470, October 15, 1966, as amended through 1992 by Pub. L 91-243, Pub. L 93-54, Pub. L 94-422, Pub. L 94-458, Pub. L 96-199, Pub. L 96-244, Pub. L 96-515, Pub. L 98-483, Pub. L 99-514, Pub. L 100-127, and Pub. L 102-575.

8. U.S. DOE. Nuclear Waste Policy Act (42 U.S.C. 10101 et seq.) and 10 CFR Part 961.

9. U.S. NRC 1976. *Preparation of Environmental Reports for Nuclear Power Stations,* Regulatory Guide 4.2, Revision 2, ADAMS Accession Number ML003739519, Washington, D.C., July 1976.

10. U.S. NRC 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants,* NUREG-1437, Volumes 1 and 2, Washington D.C., May 1996.

11. U.S. NRC 1999a. *Environmental Standard Review Plans for Environmental Reviews for Nuclear Power Plants,* NUREG-1555, Washington D.C., October 1999.

12. U.S. NRC 1999b. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, S*ection 6.3, Transportation, and Table 9.1, Summary of Findings on NEPA Issues for License Renewal of Nuclear Power

Plants, NUREG-1437, Volume 1, Addendum 1, Washington D.C., August 1999.

13. U.S. NRC 2006a. *Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site,* NUREG-1811, Office of New Reactors, Washington D.C., December 2006.

14. U.S. NRC 2006b. *Environmental Impact Statement for an Early Site Permit (ESP) at the Exelon ESP Site,* NUREG-1815, Office of Nuclear Reactor Regulation, Washington D.C., July 2006.

15. U.S. NRC 2006c. *Environmental Impact Statement for an Early Site Permit (ESP) at the Grand Gulf ESP Site,* NUREG-1817, Office of Nuclear Reactor Regulation, Washington D.C., April 2006.

16. U.S. NRC 2007. *Combined License Applications for Nuclear Power Plants (LWR Edition)*, Regulatory Guide 1.206, Office of Nuclear Regulatory Research, Washington, D.C., June 2007.

17. U.S. NRC. 10 CFR Part 52, Subparts B (Standard Design Certifications) and C (Combined Licenses).

18. U.S. NRC. 71 FR 4464, *AP1000 Design Certification,* final rule, January 27, 2006.

19. U.S. NRC, 71 FR 13870. *Notice of Issuance of Final Design Approval and Final Safety Evaluation Report, Supplement 1, for AP1000 Standard Plant Design,* Westinghouse, March 17, 2006.

20. U.S. NRC. 10 CFR Part 50, *Domestic Licensing of Production and Utilization Facilities,* Section 10, License required, (21 FR 355, January 19, 1956, as amended at 25 FR 8712, September 9, 1960; 33 FR 2381, January 31, 1968; 35 FR 11460, July 7, 1970; 37 FR 5748, March 21, 1972; 39 FR 14508, April 24, 1974; 39 FR 26279, July 18, 1974; 39 FR 33202, September 16, 1974; 43 FR 6924, February 17, 1978; and 49 FR 9403, March 12, 1984).

21. USFWS (U.S. Fish and Wildlife Service). *Endangered Species Act of 1973,* 16 U.S.C. 1531 – 1544 et seq., as amended.

22. Westinghouse 2005. *AP1000 Design Control Document,* AP1000 Document APP-GW-GL-700, Revision 15, November 11, 2005.

23. Westinghouse 2007. *AP1000 Design Control Document,* AP1000 Document APP-GW-GL-700, Revision 16, May 26, 2007.

24. Westinghouse 2008. *AP1000 Design Control Document*, AP1000 Document APP-GW-GL-700, Revision 17, September 22, 2008.

Table 1.3-1 (Sheet 1 of 2)
Environmental Report Responses to Combined Operating License Regulatory Requirements

No.	Regulatory Requirement (10 CFR)[(a)]	Responsive Environmental Report Section
1.	51.45(a), Signed original	Transmittal letter
2.	51.45(b), Description of proposed action	Chapter 3, “Plant Description”
3.	51.45(b), Statement of purpose of proposed action	Section 1.1.1, “Purpose and Need”
4.	51.45(b), Description of environment affected by proposed action	Chapter 2, “Environmental Description”
5.	51.45(b)(1), Environmental impact of proposed action	Chapters 4, “Environmental Impacts of Construction,”; 5, “Environmental Impacts of Operation”; 7, “Environmental Impact of Postulated Accidents Involving Radioactive Materials”; and 10, “Environmental Consequences of the Proposed Action”
6.	51.45(b)(2), Unavoidable adverse impacts	Section 10.1, “Unavoidable Adverse Environmental Impacts“
7.	51.45(b)(3), Alternatives to proposed action	Chapter 9, “Alternatives to the Proposed Action”
8.	51.45(b)(4), Relationship between short-term use and long-term productivity	Section 10.3, “Relationship Between Short Term Uses and Long Term Productivity of the Human Environment”
9.	51.45(b)(5), Irreversible and irretrievable commitments of resources	Section 10.2, “Irreversible and Irretrievable Commitments of Resources”
10.	51.45(c), Comparison of environmental effects of proposed action and alternatives	Chapters 4, “Environmental Impacts of Construction”; 5, “Environmental Impacts of Operation”; 7, “Environmental Impact of Postulated Accidents Involving Radioactive Materials”; 9, “Alternatives to the Proposed Action”; and 10, “Environmental Consequences of the Proposed Action”
11.	51.45(c), Alternatives for reducing or avoiding adverse environmental impacts	Sections 4.6, “Measures and Controls to Limit Adverse Impacts During Construction” and 5.10, “Measures and Controls to Limit Adverse Impacts During Operation”
12.	51.45(c), Economic, technical, and other benefits and costs of proposed action and alternatives	Section 10.4, “Benefit-Cost Balance”

Table 1.3-1 (Sheet 2 of 2)
Environmental Report Responses to Combined Operating License Regulatory Requirements

No.	Regulatory Requirement (10 CFR)[(a)]	Responsive Environmental Report Section
13.	51.45(d), Federal permits and other entitlements and status of compliance	Section 1.2, “Status of Reviews, Approvals, and Consultations”
14.	51.45(d), Compliance with Federal and other environmental quality standards and requirements	Section 1.2, “Status of Reviews, Approvals, and Consultations”
15.	51.45(d), Compliance for alternatives	Section 9.2, “Energy Alternatives” and Section 9.3, “Alternative Sites”
16.	51.45(e), Adverse information	Section 10.1, “Unavoidable Adverse Environmental Impacts“
17.	51.50 and 51.51(a), Uranium fuel cycle	Section 5.7, “Uranium Fuel Cycle Impacts”
18.	51.50 and 51.52, Fuel and waste transportation	Sections 3.8, “Transportation of Radioactive Materials,” 5.11, “Transportation of Radioactive Materials,” and 7.4, “Transportation Accidents”
19.	51.50, Reporting and record keeping procedures	Chapter 6, “Environmental Measurements and Monitoring Programs”
20.	51.50, Conditions and monitoring	Chapter 6, “Environmental Measurements and Monitoring Programs”

(a) Incorporated by reference at 10 CFR 52.79(a)(2)

Table 1.3-2 (Sheet 1 of 2)
Conformance to Division 4 Regulatory Guides

Number	Rev.	Date	Title	Environmental Report Conformance
4.1	1	04/1975	Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants	The radiological monitoring program described in Section 6.2 is based on the existing Unit 1 program, which conforms to Regulatory Guide 4.1.
4.2	2	07/1976	Preparation of Environmental Reports for Nuclear Power Stations	Because Regulatory Guide 4.2 is an earlier NRC document, and NUREG-1555 is relatively new, SCE&G chose to look to the latter for guidance in establishing the format and content of its ER. Nevertheless, Regulatory Guide 4.2 was examined for potential content for every section of this environmental report.
4.2S1	—	09/2000	Supplement 1 to Regulatory Guide 4.2, Preparation of Supplemental Environmental Reports for Applications To Renew Nuclear Power Plant Operating Licenses	Although the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437) was frequently used in this environmental report, Supplement 1 to Regulatory Guide 4.2 was not considered to be relevant.
4.4	—	05/1974	Reporting Procedure for Mathematical Models Selected To Predict Heated Effluent Dispersion in Natural Water Bodies	This Regulatory Guide is outdated. The more recent model CORMIX was used and the analysis documented in a calculation package.
4.5	—	05/1974	Measurements of Radionuclides in the Environment—Sampling and Analysis of Plutonium in Soil	Not relevant.
4.6	—	05/1974	Measurements of Radionuclides in the Environment—Strontium-89 and Strontium-90 Analyses	No radiological soil analyses were performed specifically for this environmental report. The Unit 1 radiological monitoring program forms the basis for preoperational monitoring.
4.7	2	04/1998	General Site Suitability Criteria for Nuclear Power Stations	Regulatory Guide 4.7 was examined as potential input for every section of this environmental report. However, NUREG-1555 provided the principal source of guidance for format and content. (Regulatory Guide 4,7 was directly used in the FSAR, Section 2.1.3.)
4.8	—	12/1975	Environmental Technical Specifications for Nuclear Power Plants	The environmental monitoring program for Units 2 and 3 would be based on the Unit 1 program. The Unit 1 program conforms to Regulatory Guide 4.8.
4.9	1	10/1975	Preparation of Environmental Reports for Commercial Uranium Enrichment Facilities	Not relevant.
4.11	1	08/1977	Terrestrial Environmental Studies for Nuclear Power Stations	The terrestrial monitoring program described in Section 6.5 is based on the existing Unit 1 program, which conforms to current regulatory practice.

Table 1.3-2 (Sheet 2 of 2)
Conformance to Division 4 Regulatory Guides

Number	Rev.	Date	Title	Environmental Report Conformance
4.13	1	07/1977	Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications	The radiological monitoring program described in Section 6.2 is based on the existing Unit 1 program, which conforms to current regulatory guidance.
4.14	1	04/1980	Radiological Effluent and Environmental Monitoring at Uranium Mills	Not relevant.
4.15	2	07/2007	Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment	The radiological monitoring program described in Section 6.2 is based on the existing Unit 1 program, which conforms to Regulatory Guide 4.15, Rev. 1.
4.16	1	12/1985	Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants	Not relevant.
4.17	1	03/1987	Standard Format and Content of Site Characterization Plans for High-Level-Waste Geologic Repositories	Not relevant.
4.18	—	06/1983	Standard Format and Content of Environmental Reports for Near-Surface Disposal of Radioactive Waste	Not relevant.
4.19	—	08/1988	Guidance for Selecting Sites for Near-Surface Disposal of Low-Level Radioactive Waste	Not relevant.
4.20	—	12/1996	Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees other than Power Reactors	Not relevant.
4.21	—	06/2008	Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning	Will conform.