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**Final Environmental Impact Statement  
for Combined Licenses for  
Virgil C. Summer Nuclear Station  
Units 2 and 3**

**Final Report**

**U.S. Nuclear Regulatory Commission  
Office of New Reactors  
Washington, DC 20555-0001**

**Regulatory Division  
Special Projects Branch  
Charleston District  
U.S. Army Corps of Engineers  
Charleston, SC 29403-5107**



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# **Final Environmental Impact Statement for Combined Licenses for Virgil C. Summer Nuclear Station Units 2 and 3**

## **Final Report**

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**Division of Site and Environmental Review  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
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## Abstract

This environmental impact statement (EIS) has been prepared to satisfy the requirements of the National Environmental Policy Act of 1969, as amended (NEPA). The EIS has been prepared in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by South Carolina Electric and Gas (SCE&G), acting for itself and for Santee Cooper (the State-owned electric and water utility, formally called the South Carolina Public Service Authority) for combined construction permits and operating licenses (combined licenses or COLs). The proposed actions related to the SCE&G application are (1) NRC issuance of COLs for two new nuclear power reactor units (Units 2 and 3) at the V.C. Summer Nuclear Station (VCSNS) site in Fairfield County, South Carolina, and (2) U.S. Army Corps of Engineers (USACE) permit action on a Department of the Army (DA) Individual Permit application to perform certain activities on the site. The USACE is participating with the NRC in preparing this EIS as a cooperating agency and participates collaboratively on the review team.

This EIS includes the analysis by the NRC and USACE staff that considers and weighs the environmental impacts of building and operating two new nuclear units at the VCSNS site and at alternative sites, and mitigation measures available for reducing or avoiding adverse impacts. The EIS also addresses Federally listed species, cultural resources, and essential fish habitat issues.

The EIS includes the evaluation of the proposed project's impacts to waters of the United States pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The USACE will base its evaluation of the DA Individual Permit application on the requirements of USACE regulations, the Clean Water Act Section 404(b)(1) Guidelines, and the USACE public interest review process.

After considering the environmental aspects of the proposed NRC action, the staff's recommendation to the Commission is that the COLs be issued as requested. This recommendation is based on (1) the application, including the Environmental Report (ER), submitted by SCE&G; (2) consultation with Federal, State, Tribal, and local agencies; (3) the staff's independent review; (4) the staff's consideration of comments related to the environmental review that were received during the public scoping process; (5) the NRC staff's consideration of comments on the draft EIS; and (6) the assessments summarized in this EIS, including the potential mitigation measures identified in the ER and this EIS. The USACE permit decision will be made following issuance of the final EIS.

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# Executive Summary

By letter dated March 27, 2008, the U.S. Nuclear Regulatory Commission received an application from South Carolina Electric and Gas, acting for itself and for Santee Cooper for combined construction permits and operating licenses for Virgil C. Summer Nuclear Station Units 2 and 3 to be located adjacent to the existing Unit 1 in Fairfield County, South Carolina. The NRC staff's review is based on Revisions 1 and 2 of the Environmental Report, received February 13, 2009 and July 2, 2010, respectively; responses to requests for additional information; and supplemental letters. This environmental impact statement also addresses public and agency comments received on the draft EIS published on April 15, 2010.

On March 2, 2010, SCE&G submitted a joint Federal/State Application for the Department of the Army Individual Permit to the U.S. Army Corps of Engineers. The USACE application number is SAC 2007-1852-SIR. The permit application was revised on December 16, 2010. A Public Notice advertising the revised application is being issued to coincide with the public availability of this EIS.

The proposed actions related to the VCSNS Units 2 and 3 application are NRC issuance of COLs for construction and operation of two new nuclear units at the VCSNS site, and USACE permit action on a DA Individual Permit application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The USACE is participating collaboratively on the review team. The reactors specified in the application are Westinghouse Electric Company, LLC Advanced Passive 1000 pressurized water reactors. The application references Revision 17 of the AP1000 certified design.

Section 102 of the National Environmental Policy Act of 1969, as amended, directs that an EIS be prepared for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in Title 10 of the Code of Federal Regulations Part 51. Further, in 10 CFR 51.20, the NRC has determined that the issuance of a COL under 10 CFR Part 52 is an action that requires an EIS.

The purpose of SCE&G's requested NRC action is to obtain COLs to construct and operate two baseload nuclear power plants. These licenses are necessary but not sufficient for construction and operation of the units. A COL applicant must obtain and maintain the necessary permits from other Federal, State, and local agencies and permitting authorities. Therefore, the purpose of the NRC's environmental review of the SCE&G application is to determine if two new nuclear power plants of the proposed design can be constructed and operated at the VCSNS site without unacceptable adverse impacts on the human environment. The SCE&G permit application to the USACE is for work to prepare the site and facilities for a nuclear power-generation station at the existing VCSNS site.

The NRC began the environmental review process described in 10 CFR Part 51 by publishing in the *Federal Register* on January 5, 2009, a Notice of Intent to prepare an EIS and conduct scoping. Two scoping meetings were held to obtain public input on the scope of the environmental review. The first meeting was held in Winnsboro, South Carolina, on January 27, 2009. The second meeting was held in Blair, South Carolina, on January 28, 2009. In addition, NRC held a public informational meeting for the local community on March 28, 2009. The NRC staff reviewed the comments received during the scoping process and contacted Federal, State, Tribal, regional, and local agencies to solicit comments.

To gather information and to become familiar with the sites and their environs, the NRC and its contractor, Pacific Northwest National Laboratory, visited the VCSNS site and four alternative sites in March 2009. During the site visits, the NRC staff and its contractor met with SCE&G staff, public officials, and the public. Included in this EIS are the results of the review team's analyses, which consider and weigh the environmental effects of the proposed actions; potential mitigation measures for reducing or avoiding adverse effects; the environmental impacts of alternatives to the proposed action; and the NRC staff's recommendation regarding the proposed action.

To guide its assessment of the environmental impacts of a proposed action or alternative actions, the NRC has established a standard of significance for impacts based on Council on Environmental Quality guidance. Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, provides the following definitions of the three significance levels – SMALL, MODERATE, and LARGE:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Potential mitigation measures were considered for each resource category and are discussed in the appropriate sections of the EIS.

In preparing this EIS, the NRC staff, its contractor staff, and USACE staff, referred to collectively as the review team, evaluated the applications, including the ER submitted by SCE&G; consulted with Federal, State, Tribal, and local agencies; and followed the guidance set forth in NUREG-1555, *Environmental Standard Review Plan* and the Staff Memorandum *Addressing Construction and Preconstruction, Greenhouse Gas Issues, General Conformity Determinations, Environmental Justice, Need for Power, Cumulative Impact Analysis, and*



*Cultural/Historical Resources Analysis Issues in Environmental Impact Statements.* In addition, the review team considered the public comments related to the environmental review received during the scoping process. Comments within the scope of the environmental review are included in Appendix D of this EIS.

The NRC staff's recommendation to the Commission related to the environmental aspects of the proposed action is that the COLs be issued as requested. This recommendation is based on the application, including the ER submitted by SCE&G; consultation with other Federal, State, Tribal, and local agencies; the staff's independent review; the staff's consideration of comments related to the environmental review that were received during the scoping process, the NRC staff's consideration of comments on the draft EIS; and the assessments summarized in this EIS, including the potential mitigation measures identified in the ER and this EIS. The USACE will base its evaluation of the DA Individual Permit application on the requirements of USACE regulations, the Clean Water Act Section 404 Guidelines, and the USACE public interest review process. The USACE's permit decision will be made after issuance of the final EIS.

A 75-day comment period began on April 26, 2010, the date of publication of the U.S. Environmental Protection Agency Notice of Availability of the filing of the draft EIS to allow members of the public and agencies to comment on the results of the environmental review. On May 25, 2010, the NRC and USACE staff conducted two public meetings near the VCSNS site to describe the results of the environmental review, provide members of the public with information to assist them in formulating comments on this EIS, respond to questions, and accept public comment. The public meeting also served as the USACE public hearing, which means a public proceeding conducted for the purpose of acquiring information or evidence that will be considered in evaluating a proposed DA permit action and that affords the public an opportunity to present their views, opinions, and information on such permit actions or Federal projects. After the comment period, the review team considered all the comments received during the comment period. These comments and review team responses are included in Appendix E of this final EIS.

The NRC staff's evaluation of the site safety and emergency preparedness aspects of the proposed action will be addressed in the NRC's final Safety Evaluation Report.



## Abbreviations/Acronyms

7Q10	lowest flow for 7 consecutive days expected to occur once per decade
AADT	annual average daily traffic
ac	acre
ACE	Ashepoo, Combahee, Edisto (river basin)
ac-ft	acre feet
ACHP	Advisory Council on Historic Preservation
A.D.	Anno Domini
ADAMS	Agencywide Documents Access and Management System
AEC	Atomic Energy Commission
AIS	(South Carolina) Aquatic Invasive Species (Task Force)
ALARA	as low as reasonably achievable
AP-1000	Advanced Passive 1000 pressurized water reactor
APE	area of potential effect
ARRA	American Recovery and Reinvestment Act of 2009
ASLB	Atomic Safety and Licensing Board
ASTM	American Society of Testing and Materials
AQCR	Air Quality Control Region
AQI	Air Quality Index
BA	biological assessment
BACT	Best Available Control Technology
BCRC	Brockington Cultural Resources Consulting
BEA	U.S. Bureau of Economic Analysis
BEIR VII	Biological Effects of Ionizing Radiation VII
BGEPA	Bald and Golden Eagle Protection Act
BLS	U.S. Bureau of Labor Statistics
BOD	biochemical oxygen demand
BMP	best management practice
BP	Before Present
Bq	becquerel(s)
BRWMA	Broad River Wildlife Management Area
Btu	British thermal unit
°C	degree(s) Celsius
C&D	construction and demolition debris
CAA	Clean Air Act
CBS	Carnagey Biological Services

CDC	U.S. Centers for Disease Control and Prevention
CDF	core damage frequency
CEDE	committed effective dose equivalent
CEQ	Council on Environmental Quality
CFL	compact fluorescent light
CFR	Code of Federal Regulations
cfs	cubic foot/feet per second
CGS	Cope Generating Station
Ci	curie(s)
cm	centimeter(s)
CMC	criterion maximum concentration
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
COL	combined construction permit and operating license
COLA	combined license application
CORMIX	Cornell Mixing Zone Expert System
CPCN	Certificate of Environmental Compatibility and Public Convenience and Necessity
CR	County Road
CWA	Clean Water Act (aka Federal Water Pollution Control Act)
CWIS	cooling-water intake structure
CWS	circulating-water system
CY	calendar year
d	day(s)
DA	Department of the Army
DAR	Daughters of the American Revolution
dB	decibel(s)
dBA	decibel(s) on the A-weighted scale
DBA	design basis accident
DCD	design control document
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
D/Q	deposition factor(s); annual normalized total surface concentration rate(s)
DSM	demand-side management
DTS	demineralised water treatment
EA	Environmental Assessment
EAB	exclusion area boundary
EDE	effective dose equivalent
EE/DSM	energy efficiency/demand-side management

EIA	Energy Information Administration
EIS	environmental impact statement
ELF	extremely low frequency
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
EPACT	Energy Policy Act
EPC	Engineer, Procure, Construct (contract)
EPRI	Electric Power Research Institute
EPT	Ephemeroptera, Plecoptera, and Trichoptera
ER	Environmental Report
ESA	Endangered Species Act of 1973, as amended
ESP	Early Site Permit
ESRP	Environmental Standard Review Plan
° F	degree(s) Fahrenheit
FAA	Federal Aviation Administration
FA-1	Fairfield 1
FES	Final Environmental Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FP&S	Facilities Planning & Siting
FPC	Federal Power Commission
fps	foot (feet) per second
FPSF	Fairfield Pumped Storage Facility
FR	<i>Federal Register</i>
FSAR	Final Safety Analysis Report
FSER	Final Safety Evaluation Report
ft	foot/feet
ft <sup>2</sup>	square foot/feet
ft <sup>3</sup>	cubic foot/feet
FWS	U.S. Fish and Wildlife Service
µg	microgram(s)
g	gram(s)
gal	gallon(s)
GC	gas centrifuge
GCRP	U.S. Global Change Research Program
GD	gaseous diffusion
GEIS	Generic Environmental Impact Statement
GHG	greenhouse gas
GI-LLI	gastrointestinal lower large intestine

GIS	geographic information system
gpd	gallon per day
gpm	gallon per minute
HLW	high-level waste
hr	hour
HUC	Hydrologic Unit Code
Hz	hertz
I	Interstate
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
ICRP	International Commission on Radiological Protection
IGCC	integrated gasification combined cycle
in	inch(es)
IRP	Integrated Resource Plan
IRWST	in-containment refueling water storage tank
ISFSI	independent spent-fuel storage installation
kg	kilogram(s)
km	kilometer(s)
km <sup>2</sup>	square kilometer(s)
km/hr	kilometer(s) per hour
kV	kilovolt
kW	kilowatt
kW(e)	kilowatt electric
kWh	kilowatt-hour
L	liter(s)
lb/ac/mo	pound per acre per month
Ldn	day night average sound level
LEDPA	least environmentally damaging practicable alternative
lb	pound
LFG	landfill-based gas
LLC	Limited Liability Company
LLW	low-level waste
LOCA	loss-of-coolant accident
LOS	level of service
LPZ	low-population zone
LWA	Limited Work Authorization
LWD	large woody debris

LWR	light water reactor
μmhos/cm	micromhos per centimeter
μS/cm	microsievert(s) per centimeter
MACCS	Melcor Accident Consequence Code System
m	meter(s)
m <sup>2</sup>	square meter(s)
m <sup>3</sup>	cubic meter(s)
m <sup>3</sup> /s	cubic meter(s) per second
mA	milliampere(s)
mg	milligram(s)
MEI	maximally exposed individual
Mgd	million gallon(s) per day
mGy	milligray(s)
MHW	Mean High Water
mi	mile(s)
mi <sup>2</sup>	square mile
MIT	Massachusetts Institute of Technology
mL	milliliter
mm	millimeter
MOU	Memorandum of Understanding
MOX	mixed oxides
mpg	mile(s) per gallon
mph	mile(s) per hour
mrad	millirad
mrem	millirem
msl or MSL	mean sea level
mSv	millisievert(s)
MT	metric ton(nes)
MTU	metric ton uranium
MW	megawatt(s)
MW(e)	megawatt(s) electric
MWh	megawatt-hour(s)
MW(t)	megawatt(s) thermal
MWd	megawatt-day
NA	not applicable
NAAQS	National Ambient Air Quality Standard
NAVD	Northern American Vertical Datum
NCBI	North Carolina Biotic Index
NCI	National Cancer Institute

NCRP	National Council on Radiation Protection and Measurements
NCW&SA	Newberry County Water & Sewer Authority
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act of 1969, as amended
NERC	North American Electric Reliability Corporation
NERP	National Environmental Research Park
NESC	National Electrical Safety Code
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSA	New South Associates
NSPS	new source performance standard
NSR	new source review
NTU	Nephelometric Turbidity Units
NUREG	U.S. Nuclear Regulatory Commission technical document
NWI	National Wetlands Inventory
O <sub>3</sub>	ozone
ODCM	Offsite Dose Calculation Manual
OECD	Organization for Economic Cooperation and Development
OL	operating license
OSHA	Occupational Safety and Health Administration
OW	observation well
p.	page
PAM	primary amoebic meningoencephalitis
PARS	Publically Available Records System
PBA	powerblock area
pCi	picocurie(s)
pH	measure of acidity or basicity in solution
PIR	Public Interest Review
PIRF	Public Interest Review Factor
PK-12	preschool through 12 <sup>th</sup> grade
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 microns or less



PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter of 2.5 microns or less
pp.	pages
ppm	part(s) per million
PRA	probabilistic risk assessment
PSCSC	Public Service Commission of South Carolina
PSD	Prevention of Significant Deterioration (Permit)
PURPA	Public Utility Regulatory Policies Act
PV	photovoltaic
QL	quantification limit
rad	radiation absorbed dose
RAI	Request(s) for Additional Information
RCRA	Resource Conservation and Recovery Act of 1976, as amended
rem	roentgen equivalent man
REMP	radiological environmental monitoring program
RFP	Request for Proposal
RIMS II	Regional Input-Output Modeling System
ROI	region of interest
RRS	(SERC's) Reliability Review Subcommittee
Ryr	reactor year
s or sec	second(s)
SACTI	Seasonal/Annual Cooling Tower Impact (prediction code)
SAMA	severe accident mitigation alternative
SAMDA	severe accident mitigation design alternative
Santee Cooper	The State-owned electric and water utility, formally called South Carolina Public Service Authority
SC	South Carolina
SCBCB	South Carolina Budget and Control Board
SCDAH	South Carolina Department of Archives and History
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCDOT	South Carolina Department of Transportation
SCE&G	South Caroline Electric and Gas
SCFC	South Caroline Forestry Commission
SCIAA	South Caroline Institute of Archaeology and Anthropology
SCORS	South Caroline Office of Research and Statistics
SCR	selective catalytic reduction
SCS	Santee-Cooper System
SER	Safety Evaluation Report

SERC	Southeastern Electric Reliability Council
SHPO	State Historic Preservation Office (or Officer)
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	oxides of sulfur
SR	Savannah River (alternative site)
SRP	Savannah River Plant
SRS	Savannah River Site
SSC	structures, systems, or components
SU	Standard Unit(s)
Sv	sievert(s)
SWPPP	stormwater pollution prevention plan
SWS	service-water system
T	ton(s)
TBD	to be determined
T&E	threatened and endangered
TDES	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
TEDE	total effective dose equivalent
THPO	Tribal Historic Preservation Officer
TLD	thermoluminescent dosimeters
TRC	TRC Companies, Inc.
UC	University of Chicago
UF <sub>6</sub>	uranium hexafluoride
UMTRI	University of Michigan Transportation Research Institute
UO <sub>2</sub>	uranium dioxide
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USGS	U.S. Geological Survey
US	U.S. (State Highway)
VACAR	Virginia-Carolinas (subregion)
VCSNS	Virgil C. Summer Nuclear Station
VEGP	Vogtle Electric Generating Plant
VOC	volatile organic compound

Webb	R.S. Webb and Associates
Westinghouse	Westinghouse Electric Company, LLC
WHO	World Health Organization
WWTP	wastewater-treatment plant
WY	water year (October 1 through September 30)
$\chi/Q$	atmospheric dispersion factor(s); annual average normalized air concentration value(s)
yd	yard(s)
yd <sup>3</sup>	cubic yards
yr	year(s)
yr <sup>-1</sup>	per year



## **Appendix A**

### **Contributors to the Environmental Impact Statement**



# Appendix A

## Contributors to the Environmental Impact Statement

The overall responsibility for the preparation of this environmental impact statement was assigned to the Office of New Reactors, U.S. Nuclear Regulatory Commission (NRC). The statement was prepared by members of the Office of New Reactors with assistance from other NRC organizations, the Pacific Northwest National Laboratory, and the U.S. Army Corps of Engineers.

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## Appendix A

<b>Name</b>	<b>Affiliation</b>	<b>Function or Expertise</b>
Jessica Glenny	Office of Nuclear Material Safety and Safeguards	Transportation of Radioactive Materials
Stan Echols	Office of Nuclear Material Safety and Safeguards	Fuel Cycle
George Cicotte	Office of New Reactors	Radiological Health
Charles Hinson	Office of New Reactors	Radiological Health
James Shepherd	Office of Federal and State Materials and Environmental Management Programs	Decommissioning
<b>US ARMY CORPS OF ENGINEERS</b>		
Richard Darden	Charleston District	Biologist
Allison Monroe	Charleston District	Special Projects Branch, Regulatory Division
Travis Hughes	Charleston District	Chief, Special Projects Branch; Deputy Chief, Regulatory Division
Tina Hadden	Charleston District	Chief, Regulatory Division
<b>PACIFIC NORTHWEST NATIONAL LABORATORY<sup>(a)</sup></b>		
Carl Berkowitz		Task Leader
Amanda Stegen		Task Leader, Terrestrial Ecology
Nancy Kohn		Deputy Task Leader, Plant Description, Comment Response Support
David Anderson		Land Use, Socioeconomics, Environmental Justice, Benefit-Cost Balance
Lara Aston		Terrestrial Ecology, Non-radiological Health
Larry Berg		Meteorology and Air Quality
Robert Bryce		Groundwater Hydrology
Jim Cabe		Energy and Site Alternatives, Need for Power
Andre Coleman		Mapping and Spatial Analysis
Phil Daling		Transportation
Erin Hamilton		Mapping and Spatial Analysis, Graphics Preparation
Lyle Hibler		Surface Water Hydrology
Bruce McDowell		Cumulative Impacts, General Review
Ann Miracle		Aquatic Ecology
Tara O'Neil		Cultural and Historic Resources
Ellen Prendergast-Kennedy		Cultural and Historic Resources
Jeremy Rishel		Design Basis and Severe Accidents
Nikki Sather		Aquatic Ecology
Dan Strom		Radiological Health, Fuel Cycle, Decommissioning
Lance Vail		Surface Water Hydrology
Mark Williams		Groundwater Hydrology, Geology
Terri Miley		Comment Response Support
Carolynn Suslick		Comment Response Support
Susan Ennor		Technical Editing
Dave Payson		Technical Editing
Maura Zimmerschied		Technical Editing



<b>Name</b>	<b>Affiliation</b>	<b>Function or Expertise</b>
Sharon Johnson		Reference Coordinator
Tomiann Parker		Reference Coordinator Assistant
Mary Frances Lembo		Reference Coordinator Assistant
Michael Parker		Document Design

(a) Pacific Northwest National Laboratory is operated by Battelle for the U.S. Department of Energy.



## **Appendix B**

### **Organizations Contacted**



## Appendix B

### Organizations Contacted

The following Federal, State, regional, Tribal, and local organizations were contacted during the course of the U.S. Nuclear Regulatory Commission staff's review of potential environmental impacts from the construction and operation of two new nuclear units (Units 2 and 3) at the Virgil C. Summer Nuclear Station in Fairfield County, South Carolina:

Advisory Council on Historic Preservation, Office of Federal Agency Programs, Washington, D.C.

Catawba Indian Nation, Rock Hill, South Carolina

Central SC Alliance, Columbia, South Carolina

Cherokee Nation, Tahlequah, Oklahoma

Clemson University Agricultural Extension Office, Winnsboro, South Carolina

Clemson University Cooperative Extension Service, Sandhill Institute, Columbia, South Carolina

Eastern Band of the Cherokee Nation, Cherokee, North Carolina

Fairfield County Council, South Carolina

Fairfield County Economic Development Office, Winnsboro, South Carolina

Fairfield County School District, Winnsboro, South Carolina

Fairfield County, South Carolina (offices of administrator, sheriff, tax assessor)

Federal Energy Regulatory Commission, Washington, D.C.

Gethsemane Baptist Church, Blair, South Carolina

Midlands Workforce Development Board, Columbia, South Carolina

Midlands Workforce Development Board, Fairfield Workforce Office, Winnsboro, South Carolina

National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida

National Marine Fisheries Service, Southeast Regional Office (Atlantic Branch), Charleston, South Carolina

Newberry County, South Carolina

South Carolina Department of Archives & History, Columbia, South Carolina

South Carolina Department of Health and Environmental Control, Columbia, South Carolina

South Carolina Department of Natural Resources, Columbia, South Carolina

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South Carolina Department of Transportation (Planning Department), Columbia, South Carolina

South Carolina Institute of Archaeology and Anthropology, Columbia, South Carolina

South Carolina State Historic Preservation Office, Columbia, South Carolina

Town of Jenkinsville, South Carolina

Town of Peak, South Carolina

Town of Winnsboro, South Carolina

U.S. Army Corps of Engineers, Charleston District, Charleston, South Carolina

U.S. Fish and Wildlife Service, Southeast Region 4, Charleston, South Carolina

United Keetoowah Band of Cherokee Indians, Tahlequah, Oklahoma

United Way of the Midlands, Columbia, South Carolina

White Hall African Methodist Episcopal Church, Jenkinsville, South Carolina

## **Appendix C**

### **Chronology of NRC and USACE Environmental Review Correspondence**





## Appendix C

### Chronology of NRC and USACE Environmental Review Correspondence

This appendix contains a chronological list of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and South Carolina Electric & Gas (SCE&G) and other correspondence related to the NRC staff's environmental review, under Title 10 of the Code of Federal Regulations (CFR) Part 51, for SCE&G's application for combined licenses (COLs) at the Virgil C. Summer Nuclear Station site in Fairfield County, South Carolina. This appendix also includes correspondence between the U.S. Army Corps of Engineers (USACE) and SCE&G related to SCE&G's request for a Department of the Army permit to conduct construction activities that result in alteration of waters of the United States, including wetlands.

All documents, with the exception of those containing proprietary information, are available through the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and are available electronically from the Public Electronic Reading Room found on the Internet at the following web address: <http://www.nrc.gov/reading-rm.html>. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the component of ADAMS. The ADAMS accession numbers for each document are included below.

- |                |   |
|----------------|---|
| March 27, 2008 | Letter from Mr. Stephen A. Byrne, SCE&G, to NRC transmitting the application for Combined Licenses for Virgil C. Summer Nuclear Station Units 2 and 3 (Accession No. ML081300460).  |
| June 26, 2008  | Letter from NRC to Mr. Stephen Byrne, SCE&G, acknowledging receipt of the Combined License Application for Virgil C. Summer Nuclear Station Units 2 and 3 and transmitting associated <i>Federal Register</i> Notice (Accession No. ML082310602). |
| July 9, 2008   | <i>Federal Register</i> Notice of Receipt and Availability of Application for Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (73 FR 39339).  |

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- July 31, 2008 Letter from NRC to Mr. Stephen Byrne, SCE&G, regarding the acceptance review for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application and associated *Federal Register* Notice of acceptance for docketing of SCE&G's application for combined licenses (Accession No. ML082310607).
- August 1, 2008 *Federal Register* Notice of SCE&G Acceptance for Docketing of an Application for a Combined License for the Virgil C. Summer Nuclear Station (Accession No. ML082100597).
- August 6, 2008 *Federal Register* Notice of Acceptance for Docketing of an Application for a Combined License for the Virgil C. Summer Nuclear Station (73 FR 45792).
- September 24, 2009 Letter from NRC to Ms. Laura McMaster, Fairfield County Library, Regarding Maintenance of Reference Materials for the Environmental Review of the Virgil C. Summer Nuclear Station Combined License application (Accession No. ML082490363).
- September 26, 2008 Letter from NRC to Mr. Ronald B. Clary, SCE&G, Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application Review Schedule (Accession No. ML082800232).
- January 7, 2009 Notice of Public Meeting to Discuss Environmental Scoping Process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML083520289).
- January 12, 2009 Letter from NRC to Mr. Mitchell Hicks, Eastern Band of the Cherokee, Regarding Notification and Request for Consultation and Participation in the Scoping Process for the Environmental Review of the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License application (Accession No. ML083380737).
- January 12, 2009 Letter from NRC to Mr. Donald Rogers, Catawba Indian Nation, regarding notification and request for consultation and participation in the scoping process for the environmental review of the Virgil C. Summer Nuclear Station Combined License application (Accession No. ML083380556).

- January 12, 2009 Letter from NRC to Mr. Chad 'Corntassel' Smith, Cherokee Nation, regarding notification and request for consultation and participation in the scoping process for the environmental review of the Virgil C. Summer Nuclear Station Combined License application (Accession No. ML083380585).
- January 12, 2009 Letter from NRC to Mr. George Wickliffe, United Keetoowah Band of Cherokee, regarding notification and request for consultation and participation in the scoping process for the environmental review of the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML083380614).
- January 12, 2009 Letter from NRC to Ms. Lora Zimmerman, U.S. Fish and Wildlife Service, regarding request for participation in the scoping process for the environmental review for Virgil C. Summer Nuclear Station Combined License Application (Accession No. ML083380411).
- January 12, 2009 Letter from NRC to Mr. David Bernhart, National Marine Fisheries Service, regarding request for participation in environmental scoping process and a list of protected species within the area under evaluation for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License application review (Accession No. ML083370604).
- January 12, 2009 Letter from NRC to Mr. Don Klima, Advisory Council on Historic Preservation, Regarding Request for Participation in the Scoping Process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License application review (Accession No. ML083370280).
- January 12, 2009 Letter from NRC to Ms. Caroline Wilson, South Carolina Department of Archives & History, Regarding Request for Participation in the Scoping Process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application Review (Accession No. ML083380728).
- January 12, 2009 Letter from NRC to Mr. George Taylor, Federal Energy Regulatory Commission, Regarding Request for Participation in the Scoping Process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application Review (Accession No. ML083659305).

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- January 12, 2009 Letter from NRC to Ms. Vivianne Vejdani, South Carolina Department of Natural Resources, Regarding Request for Participation in Environmental Scoping Process and List of Protected Species for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML083380682).
- January 22, 2009 Letter from Mr. Timothy Hall, U.S. Fish and Wildlife Service, to NRC regarding request for participation in the scoping process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application review (Accession No. ML090330702).
- February 10, 2009 Letter from Mr. Richard Jordan, III, USACE, to NRC requesting that the Charleston District be a cooperating agency in the Virgil C. Summer environmental review (Accession No. ML090650712).
- February 17, 2009 Letter from Ms. Charlene Dwin Vaughn, U.S. Advisory Council on Historic reservation, to NRC, regarding request for participation in the scoping process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application review (Accession No. ML090860436).
- March 3, 2009 Summary of public scoping meeting related to the environmental scoping process for Virgil C. Summer Nuclear Station, Units 2 and 3 combined license application (Accession No. ML090620448).
- March 6, 2009 Letter from Ms. Vivianne Vejdani, South Carolina Department of Natural Resources, to NRC regarding request for participation in the scoping process for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application review (Accession No. ML090840384).
- May 5, 2009 Summary of open house public meeting related to the environmental scoping process for Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML091140422).
- May 20, 2009 Letter from NRC to USACE regarding the USACE request to be a cooperating agency for the Virgil C. Summer environmental review (Accession No. ML091200404).
- June 22, 2009 Letter from NRC to Mr. Ronald Clary, SCE&G, transmitting requests for additional information in regards to Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML091340600).

June 29, 2009 Letter from Dr. Richard Darden, USACE, to SCE&G providing an approved jurisdictional determination (Accession No. ML093380013).

July 13, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting responses to NRC Environmental Report (ER) Requests for Additional Information (RAI): CR-1 and 11, AqEco-5, 6, and 8, TerEco-2 and 3, GW-4, 5, 7, and 8, LU-2, SEcon-1, 5, and 7, and BenCost-2 and 3, NND-09-0183 (Accession No. ML092020357).

July 13, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Requests for Additional Information (RAI): Alt-3, AqEco-7, CR-3, GW-6, Met-1, SEcon-6, and SW-2, NND-09-0184 (Accession No. ML092010266).

July 15, 2009 Scoping Summary Report related to the environmental scoping process for Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML091960341).

July 20, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Requests for Additional Information (RAI): TLine-2 and 3, NND-09-0198 (Accession No. ML092030443).

July 20, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting responses to NRC environmental report (ER) requests for additional information (RAI): AqEco-2, 3, 4, and 9, NND-09-0202 (Accession No. ML092040428).

July 21, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Requests for Additional Information (RAI): CR-4, 5, 7, 8, 9, and 10, and TLine-1, NND-09-0204 (Accession No. ML092040676).

July 21, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Completion Schedule for Responses to NRC Environmental Report (ER) Requests for Additional Information (RAI), NND-09-0206 (Accession No. ML092040586).

July 30, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Requests for Additional Information (RAI): CR-2 and 6, LU-1, and AqEco-1, NND-09-0209 (Accession No. ML092150358).

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- July 30, 2009 Letter from Mr. Ronald Clary, SCE&G, to USACE transmitting Response to Environmental Report (ER) Requests for Additional Information (RAI): USACE-1, NND-09-0210 (Accession No. ML09 2160218).
- August 6, 2009 Letter from Mr. Ronald Clary, SCE&G, to USACE transmitting Response to Environmental Report (ER) Requests for Additional Information (RAI): USACE- 2, 3, 4, and 5, NND-09-0236 (Accession No. ML092230165).
- August 6, 2009 E-mail from Jennifer Davis, NRC, to SCE&G, Santee Cooper, and South Carolina Department of Archives & History, and review team members concerning the process for completing Section 106 consultation (Accession No. ML092400382).
- August 7, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting response to NRC environmental report (ER) requests for additional information (RAI): BenCost-1 and SEcon-4, NND-09-0237 (Accession No. ML092230230).
- August 17, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting response to NRC environmental report (ER) requests for additional information (RAI): Met-3, NND-09-0247 (Accession No. ML092310682).
- August 25, 2009 E-mail from Tamsen Dozier, NRC to April Rice, SCE&G, concerning clarification of response to Environmental RAI GW-2 (Accession No. ML092370525).
- August 28, 2009 E-mail from Tamsen Dozier, NRC to April Rice, SCE&G, concerning clarification of response to Environmental RAI CR-3 (Accession No. ML092400161).
- September 16, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Revision to ER Section 2.7 to Incorporate Two Years of Meteorological Data, NND-09-0270 (Accession No. ML092670578).
- September 24, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting additional information to support the environmental report review of the Virgil C. Summer Nuclear Station, Units 2 & 3 - Combined License Application, NND-09-0276 (Accession No. ML092930042).
- September 30, 2009 Letter from Mr. Stephen Byrne, SCE&G, to NRC transmitting responses to NRC environmental report (ER) requests for additional information (RAI): AqEco-2 Final Report, NND-09-0280 (Accession No. ML092750412).

October 8, 2009 Letter from Mr. Stephen Byrne, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Requests for Additional Information (RAI): BenCost-1 and GW-2 Supplemental Response, NND-09-0285 (Accession No. ML092860135).

October 20, 2009 Letter from Ms. Caroline Wilson, South Carolina Department of Archives & History, to NRC regarding a V.C. Summer Nuclear Plant archaeological site (Accession No. ML093080369).

October 22, 2009 Letter from Mr. Al Paglia, SCE&G, to the South Carolina Department of Archives & History regarding an archaeological survey of approximately 7.7 Acres in the vicinity of the proposed water treatment plant, NND-09-0294.

November 19, 2009 E-mail from Tamsen Dozier, NRC, to April Rice, SCE&G, concerning clarification of responses to information need G-5 and RAI Gen-3 (Accession No. ML093270350).

November 20, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Supplemental Response to NRC Environmental Report (ER) Information Needs NP-1, AQ-11 and AQ-13, NND-09-0320 (Accession No. ML093310245).

December 1, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Response to NRC Environmental Report (ER) Request for Additional Information (RAI) Met-3 Revision 1, NND-09-0326 (Accession No. ML093420121).

December 2, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Revised Response to NRC Environmental Report (ER) Request for Additional Information (RAI) GW-3, NND-09-0333 (Accession No. ML093380302).

December 3, 2009 Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting Supplemental Response to NRC Environmental Report (ER) Request for Additional Information (RAI) Gen-3 and Information Need G-5, NND-09-0334 (Accession No. ML093410516).

December 28, 2009 Letter from Mr. Ronald Clary, SCE&G, to USACE transmitting Supplemental Response to Request for Additional Information (RAI) USACE-3, NND-09-0346 (Accession No. ML093650260).

January 19, 2010 Letter from Mr. Ronald Clary, SCE&G, to USACE transmitting Response to Request for Additional Information (RAI) USACE-2 Revision 1, NND-10-0022 (Accession No. ML100700542).

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January 19, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC transmitting the Santee Cooper 2009 Integrated Resource Plan, NND-10-0027(Accession No. ML100321529).
February 23, 2010	Letter from NRC to Mr. Ronald Clary, SCE&G, Regarding the Combined License Environmental Review Schedule (Accession No. ML100541130).
March 8, 2010	Summary of Conference Calls Held to Discuss NRC's Section 106 Consultation Process and the Environmental Review for the Combined License for the Virgil C Summer Nuclear Station Units 2 and 3 (Accession No. ML100660003).
March 18, 2010	Summary of the Environmental Site Audit and Alternative Site Visit Related to the Review of the Combined License Application for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML1004800082).
April 15, 2010	Letter from NRC to Mr. Ronald Clary, SCE&G, Regarding Notice of Availability of the Draft Environmental Impact Statement Related to the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML100700408).
April 15, 2010	Letter from NRC to the U.S. Environmental Protection Agency, Regarding the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML100680560).
April 15, 2010	Letter from NRC to Mr. Jay Herrington, U.S. Fish and Wildlife Service Southeast Region 4, Requesting Comments on the Draft Environmental Impact Statement and Biological Assessment Related to the Review of the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML100840375).
April 15, 2010	Letter from NRC to Mr. David Bernhart, National Marine Fisheries Service Southeast Regional Office, Regarding the Draft Environmental Impact Statement and Biological Assessment Related to the Review of the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML100840634).



April 15, 2010 Letter from NRC to Ms. Crystal Rippey, South Carolina Department of Health and Environmental Control, Requesting Comments on the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3, Combined License Application Review (Accession No. ML100980345).

April 15, 2010 Letter from NRC to Mr. Robert Grieve, Federal Energy Regulatory Commission, Requesting Comments on the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3, Combined License Application Review (Accession No. ML100980697).

April 15, 2010 Letter from NRC to Ms. Vivianne Vejdani, South Carolina Department of Natural Resources, Requesting Comments on the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3, Combined License Application Review (Accession No. ML100840785).

April 15, 2010 Letter from NRC to Mr. Donald Rogers, Catawba Indian Nation, Regarding Notification of the Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined Licenses Application Review (Accession No. ML100690067).

April 15, 2010 Letter from NRC to Ms. Caroline Wilson, State Historic Preservation Office, South Carolina Department of Archives & History, Regarding Section 106 Consultation and Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3, Combined Licenses Application Review (Accession No. ML100740696).

April 15, 2010 Letter from NRC to Mr. John Fowler, Advisory Council on Historic Preservation, Regarding Section 106 Consultation and Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3, Combined Licenses Application Review (Accession No. ML100740708).

April 15, 2010 Letter from NRC to Mr. Mitchell Hicks, Eastern Band of the Cherokee Nation, Regarding Notification of the Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined Licenses Application Review (Accession No. ML100690052).

## Appendix C

- April 15, 2010 Letter from NRC to Mr. George Wickliffe, United Keetoowah Band of Cherokee Indians, Regarding Notification of the Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined Licenses Application Review (Accession No. ML100680612).
- April 15, 2010 Letter from NRC to Mr. Chad "Corntassel" Smith, Cherokee Nation, Regarding Notification of the Issuance of the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined Licenses Application Review (Accession No. ML100680580).
- April 19, 2010 Letter from NRC to Mr. Gregrey Ginyard, Mayor, Town of Jenkinsville Regarding the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML101090175).
- April 19, 2010 Letter from NRC to Ms. Laura McMaster, Fairfield County Library, Regarding Maintenance of Reference Materials at the Fairfield County Library in Regards to the Review of South Carolina Electric and Gas Company and the South Carolina Public Service Authority (Santee Cooper) Combined License Application at the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Site (Accession No. ML101090247).
- April 23, 2010 NRC Notice of Availability of the Draft Environmental Impact Statement for the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101260557).
- April 26, 2010 EPA Notice of Availability of Draft Environmental Impact Statement for Virgil C. Summer Nuclear Station, Units 2 and 3 Combined License Application (Accession No. ML101260559).
- April 27, 2010 Notice of Public Meeting to Discuss Draft Environmental Impact Statement for the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101270485).
- May 25, 2010 Letter from Ms. Rebekah Dobrasko, South Carolina Department of Archives and History, State Historic Preservation Office, to NRC, Regarding the V.C. Summer Nuclear Station, Units 2 and 3 Draft Environmental Impact Statement (Accession Number ML101540528).

June 23, 2010 Summary of Public Meetings Conducted for the Draft Environmental Impact Statement for V. C. Summer Nuclear Power Station, Units 2 and 3, Combined License Application (Accession No. ML101610800).

June 25, 2010 Letter from Mr. Steven Hocking, Federal Energy Regulatory Commission, providing comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101830256).

July 6, 2010 Letter from Mr. Robert Perry, South Carolina Department of Natural Resources, to NRC, providing comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101900253).

July 9, 2010 Letter from Mr. Gregory Hogue, U.S. Department of the Interior, regarding review of the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101900261).

July 9, 2010 Letter from Mr. Heinz Mueller, Environmental Protection Agency, NEPA Program Office, to NRC, providing review and comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML102160720).

July 9, 2010 Letter from Mr. Ronald Clary, SCE&G, to NRC providing comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML101900618).

July 19, 2010 Letter from Mr. Miles Croom, National Marine Fisheries Service, to NRC, providing comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML102070376).

July 26, 2010 Letter from Mr. Jay Herrington, U.S. Fish and Wildlife Service, to NRC, providing comments on the Draft Environmental Impact Statement for V.C. Summer Nuclear Station, Units 2 and 3 (Accession No. ML102160401).

September 8, 2010 Letter from Mr. Ronald Clary, SCE&G, to NRC, providing voluntary submittal related to the Environmental Report Chapter 8 (Accession No. ML102530165).

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September 28, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing Environmental Report Revision 2 figures and related data files (Accession No. ML102780267).
October 6, 2010	E-mail from Patricia Vokoun, NRC, to April Rice, SCE&G, concerning clarification of responses to information needs NRHH-4 and NRHH-12 (Accession No. ML102790450).
October 6, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing voluntary submittal for the Environmental Report to Update Transmission Line Information (Accession No. ML102850211).
October 12, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing clarification for Information Needs NRHH4 and NRHH12 (Accession No. ML102870121).
October 19, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing SCE&G transmission line siting study revision and GIS data in support of the October 6, 2010 voluntary submittal for the Environmental Report to Update Transmission Line Information (Accession No. ML102980200).
October 27, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing updates to Figure 3.1-3 and Tables 1.2-1 through 1.2-4 in support of the July 2, 2010 submittal of Revision 2 to Part 3 (Environmental Report) of the VCSNS Units 2 and 3 COL Application (Accession No. ML103010489).
October 29, 2010	Letter from NRC to Mr. Ronald Clary, SCE&G, regarding Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application – Revised Review Schedule (Accession No. ML102160353).
November 12, 2010	E-mail from Prescott Brownell, NMFS, to Patricia Vokoun, NRC, providing information related to gravel mining in the Broad River (Accession No. ML110610751).
November 15, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing transmission line information related to threatened and endangered species (Accession No. ML103220140).
November 16, 2010	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing clarification concerning RAI TLine-1 regarding substations (Accession No. ML103220144).

December 14, 2010 Letter from Richard Darden, USACE, to SCE&G regarding a Preliminary Jurisdictional Determination for linear utility corridors (Accession No. ML110470607).

December 16, 2010 E-mail from Julie Holling, SCDNR, to Lara Aston, PNNL (terrestrial ecologist), concerning threatened and endangered species in or near transmission corridors (Accession No. ML110350208).

January 21, 2011 Letter from Tina Hadden, USACE, to SCE&G, transmitting signed cultural resources management plan and agreement (Accession No. ML110310829).

January 21, 2011 Letter from Tina Hadden, USACE, to Santee Cooper, transmitting signed cultural resources management plan and agreement (Accession No. ML110310858).

January 25, 2011 E-mail from Ryan Whited, NRC, to April Rice, SCE&G, concerning clarification of reference for alternative site acreages and the status of the Parr Steam Facility (Accession No. ML110390458).

February 1, 2011 E-mail from Patricia Vokoun, NRC, to April Rice, SCE&G, concerning clarification of response to information need SW-11 (Accession No. ML110390650).

February 1, 2011 E-mail from Patricia Vokoun, NRC, to April Rice, SCE&G, concerning clarification of response to information need Met-1 (Accession No. ML110350631).

February 1, 2011 E-mail from Patricia Vokoun, NRC, to April Rice, SCE&G, concerning clarification of response to RAI USACE-3 (Accession No. ML110390629).

February 1, 2011 E-mail from Patricia Vokoun, NRC, to April Rice, SCE&G, concerning clarification of response to information need AQ-11 (Accession No. ML110390602).

February 3, 2011 Letter from Mr. Ronald Clary, SCE&G, to NRC, providing clarification of response to RAI USACE-3 (Accession No. ML110350580).

February 8, 2011 Letter from Mr. Ronald Clary, SCE&G, to NRC, providing clarification on the reference for alternative site acreages, status of Parr facilities, transmission line crossings of federal navigable waters, and responses to information need AQ-11 (Accession No. ML110410185).

## Appendix C

February 8, 2011	Letter from Mr. Ronald Clary, SCE&G, to NRC, providing clarification regarding RAI SW-11 (Accession No. ML110410190).
March 10, 2011	Letter from NRC to Mr. Jay Herrington, U.S. Fish and Wildlife Service, transmitting supplemental information to biological assessment and requesting concurrence (Accession No. ML110600628).
March 10, 2011	Letter from NRC to Mr. David Bernhart, National Marine Fisheries Service, transmitting supplemental information to biological assessment and requesting concurrence (Accession No. ML110670209).
March 14, 2011	Letter from Mr. Jay Herrington, U.S. Fish and Wildlife Service, to NRC regarding concurrence with biological assessment (Accession No. ML110900346).

## **Appendix D**

### **Scoping Comments and Responses**





## Appendix D

### Scoping Comments and Responses

On January 5, 2009, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process in the *Federal Register* (74 FR 323). The Notice of Intent notified the public of the staff's intent to prepare an environmental impact statement (EIS) and conduct scoping for the application for combined construction permit and operating licenses (COLs) received from South Carolina Electric & Gas (SCE&G) for two new nuclear power reactors at its Virgil C. Summer Nuclear Station (VCSNS) in Fairfield County, South Carolina, identified as VCSNS Units 2 and 3. The NRC invited the SCE&G; Federal, Tribal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at the scheduled public meeting and/or submitting written suggestions and comments no later than March 6, 2009. In early March, in response to a request from the mayor of Jenkinsville, South Carolina, the NRC extended the scoping comment period to April 6, 2009.

#### D.1 Overview of the Scoping Process

The scoping process provides an opportunity for public participants to identify issues to be addressed in the EIS and highlight public concerns and issues. Two public scoping meetings were held in Fairfield County: one on January 27, 2009, at Fairfield Central High School in Winnsboro, South Carolina, and one on January 28, 2009, at McCrorey-Liston Elementary School in Blair, South Carolina. At the Winnsboro meeting, 32 attendees provided oral or written comments that were recorded and transcribed by a certified court reporter; at the Blair meeting, 25 attendees provided comments. The meeting summary and transcripts of both meetings are available electronically in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams/web-based.html> (the Public Electronic Reading Room; note that the URL is case-sensitive). The ADAMS accession numbers for the meeting summary, Winnsboro meeting transcript, and Blair meeting transcript are ML090610244, ML090410393, and ML090410326, respectively.

On March 2, 2009, the NRC published a notice of an extension to the environmental scoping period by 30 days to April 6, 2009 (74 FR 9112). The extension was granted in response to a request from the mayor of the town of Jenkinsville, South Carolina, which is the community closest to the VCSNS. The NRC also held a public informational meeting for the local community on March 28, 2009, at McCrorey-Liston Elementary School in Blair, South Carolina.

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The March 28 meeting was an informal open house at which members of the public could engage NRC staff and ask questions about the NRC's environmental review process. A meeting summary is available electronically from ADAMS (accession number ML091140076).

In addition to the oral comments and written statements submitted at the public meetings, the NRC received 11 emails and 39 letters (including letters attached to emails) containing comments during the scoping period. The NRC also received copies of a survey questionnaire originated by a member of the Jenkinsville community and completed by nearly 200 community members. Written comments or concerns expressed by the survey respondents were transcribed and captured as comments in the *Scoping Process Summary Report, V.C. Summer Nuclear Station Units 2 and 3 Combined License* (ML091960347), for consideration by the NRC staff in the same manner as comments and suggestions received during the scoping meeting or in writing afterwards.

Preparation of the EIS has taken into account the relevant issues raised during the scoping process. The comments related to this environmental review are included in this appendix. They were extracted from the *Scoping Process Summary Report, V.C. Summer Nuclear Station Units 2 and 3 Combined License* (ML091960347), and are provided for the convenience of those interested specifically in the scoping comments applicable to this environmental review. The comment categories that are outside the scope of the environmental review for the proposed VCSNS Units 2 and 3 are not included in this Appendix. These categories include comments related to:

- Safety
- Emergency Preparedness
- NRC Oversight for operating plants
- Security and Terrorism
- Support or Opposition to the licensing action, licensing process, nuclear power, hearing process, or the existing plant

To maintain consistency with the Scoping Summary Report, the correspondence identification (ID) number along with the name of the commenter used in that report is retained in this appendix.

Table D-1 identifies in alphabetical order the individuals who provided comments during the scoping period, their affiliations, if given, and the ADAMS accession number that can be used to locate the correspondence. Although all commenters are listed, the comments presented in this appendix are limited to those within the scope of the environmental review. Table D-2 lists the comment categories in alphabetical order and commenter names and comment numbers for each category. The balance of this appendix presents the comments themselves with NRC staff responses organized by topic category.

**Table D-1.** Individuals Providing Comments During Scoping Comment Period

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Correspondence ID</b>
Archie, Jeff	VC Summer Nuclear Station Unit 1	Meeting Transcript (ML090410326)	0011
Barnes, Jenifer		Letter (ML091100407) Meeting Transcript (ML090410326)	0041 0049
Barrett, J. Gresham	South Carolina	Letter (ML090410393)	0003
Beaman, Charles, Jr.	Greater Columbia Chamber of Commerce	Letter (ML090540444) Letter (ML090840370) (duplicate)	0031 0031
Benjamin, Steve	Greater Columbia Chamber of Commerce	Letter (ML090540444) Letter (ML090840370) (duplicate)	0031 0031
Berg, Michael	Carolina Peace Resource Center	Meeting Transcript (ML090410393)	0010
Brendell, Julie		Letter (ML091100407)	0041
Brown, Henry E.	South Carolina	Letter (ML090410393)	0003
Brown, Laura		Email (ML090840356)	0023
Brown, R. David	Fairfield County Council	Letter (ML090410393) Meeting Transcript (ML090410393)	0005 0010
Byrd, William A.	Privacom Ventures, Inc.	Email (ML090270892)	0001
Byrne, Stephen	South Carolina Electric & Gas	Meeting Transcript (ML090410393)	0010
Calcaterra, Ron	Central Electricity Power Cooperative	Meeting Transcript (ML090410393)	0010
Campbell, Paul G., Jr.	South Carolina State Senate	Letter (ML090780111) Letter (ML090840385) (duplicate)	0017 0017
Cincotta, Jill	Fairfield County School District	Meeting Transcript (ML090410326)	0011
Clary, C. Douglas, Jr.	Greater Chapin Chamber of Commerce	Letter (ML090410326) Meeting Transcript (ML090410326)	0007 0011
Clements, Tom	Friends of the Earth	Meeting Transcript (ML090410393) Meeting Transcript (ML090410326)	0010 0011

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Table D-1. (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Clyburn, James E.	South Carolina	Letter (ML090410393)	0003
Coahran, Franklin		Email (ML090840359)	0025
Coleman, Creighton	State of South Carolina Senate	Meeting Transcript (ML090410393)	0010
Combie, Joan	Montana Polysaccharides	Email (ML090840366)	0030
Cooper, Elaine		Meeting Transcript (ML090410393)	0010
Corbett, Susan		Meeting Transcript (ML090410393)	0010
		Meeting Transcript (ML090410326)	0011
Cromer, Allen and Dee		Email (ML090840364)	0029
DeMint, Jim	South Carolina	Letter (ML090410393)	0003
Dennis, Dan		Meeting Transcript (ML090410326)	0049
Duncan, Jeff	State of South Carolina House of Representatives	Letter (ML090720069)	0017
Ferguson, David	Fairfield County Council	Meeting Transcript (ML090410393)	0010
Gatson, Annette		Meeting Transcript (ML091070261)	0052
Gatson, Viola		Meeting Transcript (ML091070261)	0052
Ginyard, Betty		Letter (ML091070328)	0043
Ginyard, Gregrey	Town of Jenkinsville	Meeting Transcript (ML090410326)	0011
Graham, Lindsey	South Carolina	Letter (ML090410393)	0003
Greenlaw, Pamela		Meeting Transcript (ML090410393)	0010
Gregorie, Jim	Home Builders Association of South Carolina	Letter (ML090840373)	0032
Guild, Robert	Sierra Club, Friends of the Earth	Meeting Transcript (ML090410393)	0010
Gunter, Deborah		Meeting Transcript (ML090410326)	0011
Hager, Richard		Meeting Transcript (ML090410326)	0011

Table D-1. (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Hall, Timothy N.	U. S. Fish and Wildlife Service	Letter (ML090540396)	0012
Harrison, James H.	SC House of Representatives Judiciary Committee	Letter (ML090840392)	0017
Harrison, Tiffany	Fairfield County	Meeting Transcript (ML090410326)	0049
Hartmeier, Gina		Meeting Transcript (ML090410326)	0049
Hartz, John	SC Chapter of Sierra Club	Meeting Transcript (ML090410393)	0010
Hendrix, Clifton		Meeting Transcript (ML090410393)	0010
		Meeting Transcript (ML090410326)	0049
Hendrix, Samuel H.	Carolinas Associated General Contractors	Letter (ML090750701)	0046
Hentz, Darryl	Town of Pomaria	Letter (ML090420178)	0045
Hill, Carol		Meeting Transcript (ML090410326)	0011
Hope, Leslie B.	Carolinas Associated General Contractors	Letter (ML090750701)	0046
Inglis, Bob	South Carolina	Letter (ML090410393)	0003
Kinley, Mary Lynn	Fairfield County Council	Meeting Transcript (ML090410393)	0010
Knight, Travis		Meeting Transcript (ML090410393)	0010
Kosko, Jim		Email (ML090840358)	0024
Laffitte, Sterling	South Carolina Bankers Association	Letter (ML090840378)	0019
		Letter (ML090780109) (duplicate)	0019
Lanier, Hope	CASEnergy Coalition, MG&C Consulting	Letter (ML090840387)	0021
Lewis, Crosby		Letter (ML090860437)	0048
		Meeting Transcript (ML090410326)	0049
Lummus, John	South Carolina Economic Developers Association	Letter (ML090840382)	0017
		Letter (ML090840382)	0020
Mann, Deborah		Letter (ML091100407)	0041

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Table D-1. (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Marcharia, Kamau	Fairfield County Council	Meeting Transcript (ML090410393)	0010
		Meeting Transcript (ML090410326)	0011
Mason, Corry		Meeting Transcript (ML090410393)	0010
		Meeting Transcript (ML090410326)	0011
McDow, Charlie	South Carolina Congressional Delegation	Meeting Transcript (ML090410393)	0010
McLeese, Ike	Greater Columbia Chamber of Commerce	Letter (ML090540444)	0031
		Letter (ML090840370) (duplicate)	0031
McLeod, Rick	Savannah River Site Community Reuse Organization	Meeting Transcript (ML090410393)	0010
Merrill, Denver	Citizens for Sound Conservation	Letter (ML090840375)	0033
Moore, Robbie		Letter (ML091100407)	0041
Newton, Larry		Meeting Transcript (ML090410326)	0011
Novinger, Cathy	Greater Columbia Chamber of Commerce	Letter (ML090540444)	0031
		Letter (ML090840370) (duplicate)	0031
Ott, Harry L., Jr.	SC House of Representatives, Dist. 93	Letter (ML090840367)	0017
Pearson, Debra		Meeting Transcript (ML090410326)	0011
Pinson, Lewis E.	South Carolina House of Representatives	Letter (ML090750178)	0017
Powers, Theresa	Newberry County	Meeting Transcript (ML090410393)	0010
Rabb, Ernestine		Meeting Transcript (ML090410326)	0011
Ramsburgh, John	Sierra Club of South Carolina	Meeting Transcript (ML090410326)	0011
Rawl, Otis B.	South Carolina Chamber of Commerce	Letter (ML090720071)	0015
		Letter (ML090720071)	0017
Reed, Cyrus	Sierra Club	Meeting Transcript (ML091070262)	0051

Table D-1. (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Respondent, Community Survey		Meeting Transcript (ML091070261)	0052
		Meeting Transcript (ML091070262)	0051
		Meeting Transcript (ML091100158)	0050
Rhodes, Suzanne	League of Women Voters	Letter (ML090410326)	0009
		Meeting Transcript (ML090410393)	0010
Robin, Ella		Meeting Transcript (ML091070261)	0052
Robinson, Bobby		Meeting Transcript (ML091070261)	0052
Robinson, Claude		Meeting Transcript (ML091070261)	0052
Robinson, Terria		Meeting Transcript (ML091070261)	0052
Rudnicki, Steve		Meeting Transcript (ML090410326)	0011
Rudolph, Gerald		Meeting Transcript (ML090410393)	0010
Rusche, Ben	SC Governor's Nuclear Advisory Council	Letter (ML090410326)	0008
		Meeting Transcript (ML090410393)	0010
Sandifer, Bill	State of South Carolina House of Representatives	Letter (ML090720073)	0017
Schaffer, Jeff		Meeting Transcript (ML090410326)	0011
Shealy, Lewis	Town of Peak	Letter (ML090840379)	0034
Sims, Raymond	Thermo Fisher Scientific	Email (ML090840361)	0026
Smith, J. Roland	State of South Carolina House of Representatives	Letter (ML090720072)	0017
Sottile, Mike	South Carolina House of Representatives	Letter (ML090750179)	0017
Speth, Charles Ted	Greater Columbia Chamber of Commerce	Letter (ML090540444)	0031
		Letter (ML090840370) (duplicate)	0031
Spratt, John M.	South Carolina	Letter (ML090410393)	0003
Survey Respondent, 174		Meeting Transcript (ML091100158)	0050
Tansey, Sara		Meeting Transcript (ML090410393)	0010

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Table D-1. (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Thomas, Ralph	South Carolina Power Team	Meeting Transcript (ML090410393)	0010
Thomas, Ruth		Letter (ML090840393)	0037
		Letter (ML090860670) (duplicate)	0037
		Letter (ML091100339)	0040
		Letter (ML091100482) (duplicate)	0040
Thordahl, Jeff		Letter (ML090840390)	0017
Todd, J. Richards	South Carolina Trucking Association	Letter (ML090720070)	0014
Toole, W.R. (Rick)	Savannah River Site Community Reuse Organization	Letter (ML090410393)	0006
		Meeting Transcript (ML090410393)	0010
Vasuki, N.T.		Meeting Transcript (ML090410393)	0010
Vejdani, Vivianne	SC Department of Natural Resources	Letter (ML090840384)	0036
Von Kaenel, Hoyt		Meeting Transcript (ML090410393)	0010
Whatley, Michael	Southeast Energy Alliance	Letter (ML090820082)	0047
Whetsell, David		Email (ML090840363)	0028
White, Sonny	Midlands Technical College	Meeting Transcript (ML090410393)	0010
Whitten, Robert	Showa Denko Carbon	Meeting Transcript (ML090410393)	0010
Wiggs, Rose Mary		Email (ML090840362)	0027
Wilder, Ronald	University of South Carolina	Letter (ML091100339)	0040
		Letter (ML091100482) (duplicate)	0040
Wilson, Joe	South Carolina	Letter (ML090410393)	0003
Winsor, Susan A.	Aiken Technical College	Letter (ML090410393)	0004
Wojcicki, Joe		Email (ML091100341)	0044
		Meeting Transcript (ML090410393)	0010
		Meeting Transcript (ML090410326)	0011



**Table D-1.** (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Corres- pondence ID</b>
Wolfe, Clint	Citizens for Technology	Meeting Transcript (ML090410326)	0011
	Awareness	Meeting Transcript (ML090410393)	0010
Zia, Barbara	League of Women Voters of South Carolina	Email (ML090840383)	0035

**Table D-2.** Comment Categories with Associated Commenters and Comment IDs

<b>Comment Category</b>	<b>Commenter (Comment ID)</b>
Accidents-Severe	<ul style="list-style-type: none"> <li>• Gatson, Viola (0052-24)</li> <li>• Guild, Robert (0010-186)</li> <li>• Respondent, Community Survey (0050-84) (0051-11)</li> <li>• Thomas, Ruth (0037-4) (0037-15)</li> </ul>
Alternatives-Energy	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0049-10)</li> <li>• Berg, Michael (0010-23) (0010-25)</li> <li>• Byrd, William A. (0001-2) (0001-3)</li> <li>• Byrne, Stephen (0010-100)</li> <li>• Clements, Tom (0010-46) (0011-75)</li> <li>• Corbett, Susan (0010-65) (0010-75) (0011-116) (0011-117) (0011-122)</li> <li>• Dennis, Dan (0049-20) (0049-21) (0049-23)</li> <li>• Greenlaw, Pamela (0010-136)</li> <li>• Guild, Robert (0010-130)</li> <li>• Knight, Travis (0010-178)</li> <li>• Mason, Corry (0011-97)</li> <li>• Merrill, Denver (0033-6) (0033-7) (0033-8)</li> <li>• Newton, Larry (0011-124) (0011-125) (0011-127)</li> <li>• Rhodes, Suzanne (0009-1) (0009-2) (0010-53)</li> <li>• Sims, Raymond (0026-2) (0026-6)</li> <li>• Thomas, Ralph (0010-148)</li> <li>• Thomas, Ruth (0037-7) (0037-14)</li> <li>• Von Kaenel, Hoyt (0010-95) (0010-96)</li> <li>• Whetsell, David (0028-2)</li> <li>• Wiggs, Rose Mary (0027-1)</li> <li>• Wojcicki, Joe (0010-92) (0044-23)</li> <li>• Wolfe, Clint (0011-53) (0011-54) (0011-56)</li> <li>• Zia, Barbara (0035-1) (0035-3)</li> </ul>
Alternatives-Sites	<ul style="list-style-type: none"> <li>• Wojcicki, Joe (0010-82) (0010-84) (0010-89) (0011-58) (0011-59) (0011-61) (0011-63) (0011-68) (0044-3) (0044-7) (0044-8) (0044-10) (0044-19)</li> </ul>

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**Table D-2.** (contd)

Comment Category	Commenter (Comment ID)
Benefit-Cost Balance	<ul style="list-style-type: none"> <li>• Berg, Michael (0010-24)</li> <li>• Clements, Tom (0010-47) (0010-49) (0011-70)</li> <li>• Cooper, Elaine (0010-119)</li> <li>• Corbett, Susan (0010-76) (0011-115) (0011-118)</li> <li>• Guild, Robert (0010-128)</li> <li>• Knight, Travis (0010-179)</li> <li>• Mason, Corry (0010-155) (0011-94)</li> <li>• Ramsburgh, John (0011-18) (0011-20)</li> <li>• Thomas, Ruth (0040-3) (0040-4) (0040-5) (0040-6)</li> <li>• Wilder, Ronald (0040-3) (0040-4) (0040-5) (0040-6)</li> <li>• Wolfe, Clint (0010-110)</li> </ul>
Cumulative Impacts	<ul style="list-style-type: none"> <li>• Clements, Tom (0010-51)</li> <li>• Gunter, Deborah (0011-90)</li> <li>• Hall, Timothy N. (0012-1)</li> <li>• Merrill, Denver (0033-2)</li> <li>• Sims, Raymond (0026-1)</li> <li>• Tansey, Sara (0010-58)</li> <li>• Thomas, Ruth (0037-16)</li> <li>• Wojcicki, Joe (0044-12) (0044-13)</li> <li>• Wolfe, Clint (0011-50)</li> </ul>
Decommissioning	<ul style="list-style-type: none"> <li>• Byrne, Stephen (0010-104)</li> </ul>
Ecology-Aquatic	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-2) (0041-3) (0041-5) (0049-2) (0049-3)</li> <li>• Brendell, Julie (0041-2) (0041-3) (0041-5)</li> <li>• Hall, Timothy N. (0012-2) (0012-3) (0012-4) (0012-5) (0012-13)</li> <li>• Mann, Deborah (0041-2) (0041-3) (0041-5)</li> <li>• Moore, Robbie (0041-2) (0041-3) (0041-5)</li> <li>• Respondent, Community Survey (0051-47)</li> <li>• Vejdani, Vivianne (0036-1) (0036-2) (0036-11) (0036-13) (0036-18)</li> <li>• Wojcicki, Joe (0011-67)</li> </ul>
Ecology-Terrestrial	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-4) (0049-4)</li> <li>• Brendell, Julie (0041-4)</li> <li>• Dennis, Dan (0049-26)</li> <li>• Hall, Timothy N. (0012-6) (0012-7) (0012-8) (0012-9) (0012-10) (0012-11) (0012-14)</li> <li>• Mann, Deborah (0041-4)</li> <li>• Moore, Robbie (0041-4)</li> <li>• Respondent, Community Survey (0050-61)</li> <li>• Vejdani, Vivianne (0036-3) (0036-14) (0036-15)</li> </ul>
Environmental Justice	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-15) (0041-17)</li> <li>• Brendell, Julie (0041-15) (0041-17)</li> </ul>

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	<ul style="list-style-type: none"> <li>• Clements, Tom (0011-78)</li> <li>• Corbett, Susan (0010-64) (0010-66) (0011-114)</li> <li>• Gunter, Deborah (0011-92)</li> <li>• Hager, Richard (0011-108)</li> <li>• Hill, Carol (0011-85)</li> <li>• Mann, Deborah (0041-15) (0041-17)</li> <li>• Marcharia, Kamau (0010-34) (0010-36) (0011-24) (0011-33)</li> <li>• Mason, Corry (0010-152) (0010-156)</li> <li>• Moore, Robbie (0041-15) (0041-17)</li> <li>• Rabb, Ernestine (0011-82)</li> <li>• Respondent, Community Survey (0050-4) (0050-45) (0050-50) (0050-54) (0051-7) (0051-37) (0051-68)</li> <li>• Tansey, Sara (0010-61)</li> <li>• Wojcicki, Joe (0010-87) (0010-88)</li> </ul>
Geology	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-18) (0041-19)</li> <li>• Brendell, Julie (0041-18) (0041-19)</li> <li>• Mann, Deborah (0041-18) (0041-19)</li> <li>• Moore, Robbie (0041-18) (0041-19)</li> </ul>
Health-Nonradiological	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-21)</li> <li>• Brendell, Julie (0041-21)</li> <li>• Ginyard, Betty (0043-1)</li> <li>• Knight, Travis (0010-176)</li> <li>• Mann, Deborah (0041-21)</li> <li>• Moore, Robbie (0041-21)</li> <li>• Respondent, Community Survey (0050-2) (0050-63)</li> <li>• Whetsell, David (0028-1)</li> </ul>
Health-Radiological	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-16)</li> <li>• Berg, Michael (0010-18)</li> <li>• Brendell, Julie (0041-16)</li> <li>• Clements, Tom (0011-77)</li> <li>• Cooper, Elaine (0010-113)</li> <li>• Corbett, Susan (0010-68) (0010-70) (0010-72) (0011-120) (0011-121)</li> <li>• Gatson, Annette (0052-27)</li> <li>• Gatson, Viola (0052-23)</li> <li>• Ginyard, Betty (0043-2)</li> <li>• Gunter, Deborah (0011-91)</li> <li>• Knight, Travis (0010-177)</li> <li>• Mann, Deborah (0041-16)</li> <li>• Mason, Corry (0010-160)</li> <li>• Moore, Robbie (0041-16)</li> <li>• Respondent, Community Survey (0050-6) (0050-25) (0050-26) (0050-31)</li> </ul>

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**Table D-2.** (contd)

Comment Category	Commenter (Comment ID)
	(0050-35) (0050-40) (0050-41) (0050-46) (0050-59) (0050-66) (0050-76) (0050-78) (0051-2) (0051-13) (0051-16) (0051-20) (0051-21) (0051-22) (0051-23) (0051-30) (0051-33) (0051-41) (0051-42) (0051-44) (0051-45) (0051-51) (0051-52) (0051-53) (0051-54) (0051-58) (0051-59) (0051-62) (0051-67) (0052-1) (0052-6) (0052-7) (0052-8) (0052-9) (0052-18) (0052-19) (0052-22)
	<ul style="list-style-type: none"> <li>• Robin, Ella (0052-10)</li> <li>• Robinson, Bobby (0052-26)</li> <li>• Robinson, Claude (0052-14)</li> <li>• Robinson, Terria (0052-12)</li> <li>• Sims, Raymond (0026-4)</li> <li>• Tansey, Sara (0010-54) (0010-55) (0010-56)</li> <li>• Thomas, Ruth (0037-11)</li> <li>• Wolfe, Clint (0011-51) (0011-52)</li> </ul>
Historic and Cultural Resources	<ul style="list-style-type: none"> <li>• Lewis, Crosby (0049-28)</li> </ul>
Hydrology-Groundwater	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-6) (0049-6)</li> <li>• Brendell, Julie (0041-6)</li> <li>• Mann, Deborah (0041-6)</li> <li>• Moore, Robbie (0041-6)</li> <li>• Respondent, Community Survey (0050-42)</li> </ul>
Hydrology-Surface Water	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-1) (0041-7) (0041-8) (0049-5)</li> <li>• Berg, Michael (0010-22)</li> <li>• Brendell, Julie (0041-1) (0041-7) (0041-8)</li> <li>• Byrne, Stephen (0010-101) (0010-102)</li> <li>• Cooper, Elaine (0010-116)</li> <li>• Hartmeier, Gina (0049-40)</li> <li>• Hill, Carol (0011-84)</li> <li>• Mann, Deborah (0041-1) (0041-7) (0041-8)</li> <li>• Mason, Corry (0011-102)</li> <li>• Merrill, Denver (0033-3)</li> <li>• Moore, Robbie (0041-1) (0041-7) (0041-8)</li> <li>• Respondent, Community Survey (0050-58) (0051-17) (0052-17)</li> <li>• Thomas, Ruth (0037-2) (0037-9) (0037-13)</li> <li>• Vejdani, Vivianne (0036-4) (0036-6) (0036-7) (0036-8) (0036-9) (0036-10) (0036-12) (0036-16) (0036-17) (0036-19)</li> <li>• Wojcicki, Joe (0010-90) (0010-93) (0011-62) (0011-64) (0011-65) (0044-1) (0044-14)</li> <li>• Zia, Barbara (0035-9) (0035-10)</li> </ul>
Land Use-Site and Vicinity	<ul style="list-style-type: none"> <li>• Respondent, Community Survey (0050-69) (0051-74)</li> <li>• Wojcicki, Joe (0010-83)</li> </ul>

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
Land Use-Transmission Lines	<ul style="list-style-type: none"> <li>• Respondent, Community Survey (0051-1)</li> <li>• Vejdani, Vivianne (0036-5)</li> <li>• Wojcicki, Joe (0010-85) (0010-86) (0044-2)</li> </ul>
Meteorology and Air Quality	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-13)</li> <li>• Brendell, Julie (0041-13)</li> <li>• Knight, Travis (0010-175)</li> <li>• Mann, Deborah (0041-13)</li> <li>• Mason, Corry (0011-103)</li> <li>• Moore, Robbie (0041-13)</li> <li>• Powers, Theresa (0010-14)</li> <li>• Respondent, Community Survey (0050-9) (0052-16)</li> <li>• Robin, Ella (0052-11)</li> <li>• Robinson, Claude (0052-15)</li> <li>• Robinson, Terria (0052-13)</li> </ul>
Need for Power	<ul style="list-style-type: none"> <li>• Beaman, Charles, Jr. (0031-2)</li> <li>• Benjamin, Steve (0031-2)</li> <li>• Byrd, William A. (0001-4)</li> <li>• Campbell, Paul G., Jr. (0017-4)</li> <li>• Clary, C. Douglas, Jr. (0011-10)</li> <li>• Duncan, Jeff (0017-4)</li> <li>• Gatson, Viola (0052-25)</li> <li>• Gregorie, Jim (0032-2)</li> <li>• Guild, Robert (0010-129) (0010-131)</li> <li>• Harrison, James H. (0017-4)</li> <li>• Hendrix, Samuel H. (0046-4)</li> <li>• Hope, Leslie B. (0046-4)</li> <li>• Kinley, Mary Lynn (0010-45)</li> <li>• Laffitte, Sterling (0017-4)</li> <li>• Lanier, Hope (0021-4)</li> <li>• Lummus, John (0017-4)</li> <li>• McLeese, Ike (0031-2)</li> <li>• Newton, Larry (0011-123) (0011-126)</li> <li>• Novinger, Cathy (0031-2)</li> <li>• Ott, Harry L., Jr. (0017-4)</li> <li>• Pinson, Lewis E. (0017-4)</li> <li>• Powers, Theresa (0010-12)</li> <li>• Rawl, Otis B. (0017-4)</li> <li>• Respondent, Community Survey (0051-18) (0052-21)</li> <li>• Rudnicki, Steve (0011-42)</li> <li>• Sandifer, Bill (0017-4)</li> <li>• Smith, J. Roland (0017-4)</li> <li>• Sottile, Mike (0017-4)</li> </ul>

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**Table D-2.** (contd)

Comment Category	Commenter (Comment ID)
Process-COL	<ul style="list-style-type: none"> <li>• Speth, Charles Ted (0031-2)</li> <li>• Tansey, Sara (0010-57)</li> <li>• Thomas, Ralph (0010-147)</li> <li>• Thordahl, Jeff (0017-4)</li> <li>• Toole, W.R. (Rick) (0010-183)</li> <li>• Whatley, Michael (0047-2)</li> <li>• White, Sonny (0010-4)</li> <li>• Whitten, Robert (0010-80)</li> <li>• Winsor, Susan A. (0004-2)</li> <li>• Wojcicki, Joe (0011-60) (0044-15)</li> <li>• Zia, Barbara (0035-4)</li> </ul>
Process-NEPA	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0049-1)</li> <li>• Clements, Tom (0010-52)</li> <li>• Ginyard, Gregrey (0011-5) (0011-7) (0011-8)</li> <li>• Greenlaw, Pamela (0010-133) (0010-139) (0010-141)</li> <li>• Guild, Robert (0010-121) (0010-123) (0010-124)</li> <li>• Hager, Richard (0011-109)</li> <li>• Hendrix, Clifton (0049-35) (0049-38)</li> <li>• Hill, Carol (0011-87)</li> <li>• Lewis, Crosby (0049-32) (0049-33)</li> <li>• Marcharia, Kamau (0010-39)</li> <li>• Ramsburgh, John (0011-14) (0011-15) (0011-21)</li> <li>• Thomas, Ruth (0037-6) (0037-8) (0037-10) (0037-17)</li> <li>• Wojcicki, Joe (0044-4) (0044-6) (0044-20) (0044-21)</li> </ul>
Site Layout and Design	<ul style="list-style-type: none"> <li>• Clements, Tom (0011-72)</li> <li>• Guild, Robert (0010-122) (0010-125) (0010-127) (0010-132)</li> <li>• Hartz, John (0010-78)</li> <li>• Ramsburgh, John (0011-16)</li> <li>• Thomas, Ruth (0037-1) (0040-1)</li> <li>• Wilder, Ronald (0040-1)</li> <li>• Barnes, Jenifer (0041-14)</li> <li>• Brendell, Julie (0041-14)</li> <li>• Clements, Tom (0010-48) (0011-73)</li> <li>• Cooper, Elaine (0010-118)</li> <li>• Greenlaw, Pamela (0010-134) (0010-135) (0010-137) (0010-138)</li> <li>• Guild, Robert (0010-132)</li> <li>• Knight, Travis (0010-174)</li> <li>• Mann, Deborah (0041-14)</li> <li>• Moore, Robbie (0041-14)</li> <li>• Respondent, Community Survey (0051-4)</li> <li>• Rudnicki, Steve (0011-45)</li> </ul>

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
Socioeconomics	<ul style="list-style-type: none"> <li>• Wojcicki, Joe (0010-94) (0011-66)</li> <li>• Wolfe, Clint (0010-108)</li> <li>• Zia, Barbara (0035-7) (0035-8)</li> </ul>
	<ul style="list-style-type: none"> <li>• Archie, Jeff (0011-37)</li> <li>• Barnes, Jenifer (0041-9) (0041-20) (0041-22) (0041-23) (0049-9) (0049-11)</li> <li>• Beaman, Charles, Jr. (0031-3)</li> <li>• Benjamin, Steve (0031-3)</li> <li>• Brendell, Julie (0041-9) (0041-20) (0041-22) (0041-23)</li> <li>• Byrd, William A. (0001-6)</li> <li>• Campbell, Paul G., Jr. (0017-6) (0017-7)</li> <li>• Cincotta, Jill (0011-1) (0011-4)</li> <li>• Clements, Tom (0011-74)</li> <li>• Combie, Joan (0030-1)</li> <li>• Cooper, Elaine (0010-114) (0010-117)</li> <li>• Corbett, Susan (0011-113)</li> <li>• Dennis, Dan (0049-18) (0049-19) (0049-24) (0049-27)</li> <li>• Duncan, Jeff (0017-6) (0017-7)</li> <li>• Ginyard, Gregrey (0011-6)</li> <li>• Gregorie, Jim (0032-3)</li> <li>• Hall, Timothy N. (0012-12)</li> <li>• Harrison, James H. (0017-6) (0017-7)</li> <li>• Harrison, Tiffany (0049-14) (0049-15) (0049-16)</li> <li>• Hartz, John (0010-77)</li> <li>• Hendrix, Clifton (0010-163) (0010-167) (0049-36) (0049-37)</li> <li>• Hendrix, Samuel H. (0046-6)</li> <li>• Hill, Carol (0011-86)</li> <li>• Hope, Leslie B. (0046-6)</li> <li>• Laffitte, Sterling (0017-6) (0017-7)</li> <li>• Lanier, Hope (0021-6)</li> <li>• Lewis, Crosby (0048-4) (0048-5)</li> <li>• Lummus, John (0017-6) (0017-7)</li> <li>• Mann, Deborah (0041-9) (0041-20) (0041-22) (0041-23)</li> <li>• Marcharia, (0010-33)</li> <li>• Marcharia, Kamau (0010-28) (0010-29) (0010-30) (0010-31) (0010-37) (0010-38) (0011-22) (0011-23) (0011-25) (0011-26) (0011-27) (0011-29) (0011-30) (0011-31)</li> <li>• McLeese, Ike (0031-3)</li> <li>• Merrill, Denver (0033-9) (0033-12)</li> <li>• Moore, Robbie (0041-9) (0041-20) (0041-22) (0041-23)</li> <li>• Novinger, Cathy (0031-3)</li> <li>• Ott, Harry L., Jr. (0017-6) (0017-7)</li> </ul>

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	<ul style="list-style-type: none"> <li>• Pinson, Lewis E. (0017-6) (0017-7)</li> <li>• Powers, Theresa (0010-15) (0010-17)</li> <li>• Rabb, Ernestine (0011-80)</li> <li>• Ramsburgh, John (0011-17) (0011-19)</li> <li>• Rawl, Otis B. (0017-6) (0017-7)</li> <li>• Reed, Cyrus (0051-48)</li> <li>• Respondent, Community Survey (0050-1) (0050-3) (0050-8) (0050-10) (0050-15) (0050-16) (0050-17) (0050-19) (0050-22) (0050-27) (0050-32) (0050-33) (0050-34) (0050-36) (0050-37) (0050-38) (0050-39) (0050-43) (0050-44) (0050-48) (0050-49) (0050-51) (0050-52) (0050-56) (0050-57) (0050-60) (0050-62) (0050-64) (0050-65) (0050-67) (0050-68) (0050-71) (0050-73) (0050-74) (0050-75) (0050-77) (0050-79) (0050-80) (0050-81) (0050-82) (0050-83) (0051-5) (0051-12) (0051-24) (0051-26) (0051-36) (0051-38) (0051-39) (0051-40) (0051-43) (0051-46) (0051-49) (0051-50) (0051-55) (0051-56) (0051-57) (0051-60) (0051-61) (0051-63) (0051-64) (0051-65) (0051-66) (0051-69) (0051-70) (0051-71) (0051-72) (0051-73) (0052-20)</li> <li>• Rudnicki, Steve (0011-48)</li> <li>• Rudolph, Gerald (0010-169) (0010-170)</li> <li>• Sandifer, Bill (0017-6) (0017-7)</li> <li>• Schaffer, Jeff (0011-89)</li> <li>• Sims, Raymond (0026-3)</li> <li>• Smith, J. Roland (0017-6) (0017-7)</li> <li>• Sottile, Mike (0017-6) (0017-7)</li> <li>• Speth, Charles Ted (0031-3)</li> <li>• Tansey, Sara (0010-60)</li> <li>• Thordahl, Jeff (0017-6) (0017-7)</li> <li>• Todd, J. Richards (0014-1)</li> <li>• Whatley, Michael (0047-4)</li> <li>• White, Sonny (0010-5)</li> <li>• Wojcicki, Joe (0010-91) (0044-17) (0044-22)</li> <li>• Zia, Barbara (0035-5)</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• Barnes, Jenifer (0041-11)</li> <li>• Brendell, Julie (0041-11)</li> <li>• Hall, Timothy N. (0012-15)</li> <li>• Mann, Deborah (0041-11)</li> <li>• Moore, Robbie (0041-11)</li> </ul>
Uranium Fuel Cycle	<ul style="list-style-type: none"> <li>• Archie, Jeff (0011-39) (0011-40)</li> <li>• Berg, Michael (0010-21)</li> <li>• Byrne, Stephen (0010-101)</li> <li>• Clements, Tom (0010-50) (0011-76)</li> <li>• Cooper, Elaine (0010-115)</li> </ul>



**Table D-2.** (contd)

<b>Comment Category</b>	<b>Commenter (Comment ID)</b>
	<ul style="list-style-type: none"> <li>• Corbett, Susan (0010-73) (0010-74) (0011-119)</li> <li>• Hartmeier, Gina (0049-41)</li> <li>• Knight, Travis (0010-173) (0010-180)</li> <li>• Lewis, Crosby (0048-2)</li> <li>• Merrill, Denver (0033-11)</li> <li>• Respondent, Community Survey (0050-13) (0050-29) (0051-10)</li> <li>• Rudnicki, Steve (0011-47)</li> <li>• Rudolph, Gerald (0010-168)</li> <li>• Tansey, Sara (0010-59)</li> <li>• Thomas, Ruth (0037-3) (0037-12)</li> <li>• Wolfe, Clint (0010-109)</li> <li>• Zia, Barbara (0035-6)</li> </ul>

## D.2 In-Scope Comments and Responses

The in-scope comment categories are listed in Table D-3 in the order that they are presented in this EIS. The comments and responses for the in-scope categories are included below the table. Parenthetical numbers shown after each comment refer to the comment identification (ID) number (correspondence number-comment number) and the commenter name.

**Table D-3.** Comment Categories in Order as Presented in this Report

D.2.1 Comments Concerning the COL Process
D.2.2 Comments Concerning NEPA
D.2.3 Comments Concerning Site Layout and Design
D.2.4 Comments Concerning Land Use - Site and Vicinity
D.2.5 Comments Concerning Land Use - Transmission Lines
D.2.6 Comments Concerning Meteorology and Air Quality
D.2.7 Comments Concerning Geology
D.2.8 Comments Concerning Hydrology - Surface Water
D.2.9 Comments Concerning Hydrology - Groundwater
D.2.10 Comments Concerning Ecology - Terrestrial
D.2.11 Comments Concerning Ecology - Aquatic
D.2.12 Comments Concerning Socioeconomics
D.2.13 Comments Concerning Historic and Cultural Resources
D.2.14 Comments Concerning Environmental Justice

**Table D-3.** (contd)

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D.2.15 Comments Concerning Health - Non - Radiological
D.2.16 Comments Concerning Health - Radiological
D.2.17 Comments Concerning Accidents - Severe
D.2.18 Comments Concerning the Uranium Fuel Cycle
D.2.19 Comments Concerning Transportation
D.2.20 Comments Concerning Decommissioning
D.2.21 Comments Concerning Cumulative Impacts
D.2.22 Comments Concerning the Need for Power
D.2.23 Comments Concerning Alternatives - Energy
D.2.24 Comments Concerning Alternatives - Sites
D.2.25 Comments Concerning Benefit-Cost Balance

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### **D.2.1 Comments Concerning the COL Process**

**Comment:** And those are some of the concerns that people have, in our community, and we would like to know, who would you go to? Because I talked, earlier, folks couldn't answer those questions. So who can answer those questions for the community? (0010-39 [Marcharia, Kamau])

**Response:** *For plant-specific safety and environmental questions related to new reactor applications, members of the public can contact the safety and/or environmental project manager assigned by the NRC for the license review for the specific plant. The name for each of the NRC safety and environmental project managers is given on the NRC website and their phone numbers can be obtained from the phone directory on the NRC website. In addition, contact information is provided in the appropriate Federal Register notices and at the public meetings. The NRC safety and environmental project managers can either answer questions or direct callers to the appropriate person at the NRC. In addition, many answers to questions that are not included in this document can be found on the NRC website at [www.nrc.gov](http://www.nrc.gov). The NRC has developed a number of "frequently asked questions" documents, as well as informational brochures and fact sheets, all of which can be accessed from <http://www.nrc.gov/reading-rm/faqlist.html>. Members of the public are also invited to plant-specific public meetings, where NRC staff members are available to answer both generic and site-specific questions.*

**Comment:** There were some discrepancies in the presentation about how the public was, or how notice has gone out about this hearing. Unfortunately SCE&G, and I feel this is very unfair, as a participant in the Public Service Commission process, they testified about these hearings

tonight, and tomorrow night, in early December. They already knew about them. The public was not notified until December 5th, in the notice that appeared in the Federal Register. The company received, or was sent a letter, on December 24th, from the NRC, talking about the hearings tonight. But we, the public, didn't know about this, officially, until January 5th. They sent letters, the NRC sent letters to the Department of Natural Resources, Fish and Wildlife, and others, on January 12th. So I'm quite concerned that the NRC is giving the inside track, not only tonight, but possibly in other EIS, or other meetings, to the Applicant. That should not be the case. The public should be informed of these meetings at the same time the company is, and that did not take place for these meetings tonight. That is quite unfortunate, and I hope that there is some investigation of this, because this is not the way that the NRC should be conducting the public's business. (0010-52 [Clements, Tom])

**Response:** *The public has the opportunity to become informed about upcoming licensing reviews for new nuclear power plants many months before licensing applications are received by NRC. The scoping period given in the NOI is for 60 days, which includes the opportunity to provide scoping comments following the public meeting. If additional time is desired, a request to extend the scoping period can be made to accommodate the needs of stakeholders. In fact, the scoping period was extended in this instance.*

**Comment:** We have sought to intervene in the licensing proceeding for the V.C. Summer units 2 and 3, before the Nuclear Regulatory Commission Licensing Boards, and have filed a petition to intervene, which raises a series of contentions challenging the adequacy of the environmental review submitted by SCE&G and Santee Cooper, in support of the Commission's compliance with the National Environmental Policy Act. Our contentions identify numerous deficiencies in the company's environmental report. (0010-121 [Guild, Robert])

**Comment:** I'd like to let you know that the company, SCE&G company, that claims to be such good corporate neighbors, and the NRC staff that has insisted tonight that they are so open to hearing from the public, both of them have opposed every single issue raised by the Sierra Club, and Friends of the Earth, and our petition to intervene. (0010-123 [Guild, Robert])

**Comment:** The NRC staff has opposed consideration of each and every environmental issue raised by the Sierra Club, and Friends of the Earth, and has insisted that the petitions to intervene be dismissed. (0010-124 [Guild, Robert])

**Response:** *The hearing process is more formal than the scoping process and the process for submitting comments on the draft EIS. Petitions to intervene in the hearing can only be granted if the regulatory requirements for intervention have been met. An Atomic Safety and Licensing Board (ASLB) rules on each petition to intervene in the hearing. The NRC staff only provides to the ASLB its views on whether the requirements for intervention have been met.*

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**Comment:** You are having the environmental hearing, but I didn't hear when you had or will have the safety set of hearings. Is that coming up, or has that already happened? (0010-139 [Greenlaw, Pamela])

**Response:** *The public scoping meeting is not an environmental hearing. It is a meeting to receive information from the public to aid the staff in determining the scope of the EIS. A hearing will be held on both the environmental and the safety aspects of the review. There is no public scoping period for the safety review. During the safety review process, the staff holds meetings with the applicant to discuss the review of the application. The public is invited to observe and has the opportunity to comment at the conclusion of the technical portion of the meeting. The results of the staff's safety review are available to the public. However, the highly technical nature of the staff's safety review does not lend itself to a public involvement process such as that used for the environmental review. As a result, there is no notification in Federal Register notices related to an opportunity to comment on the safety review prior to its issuance. However, a safety evaluation report with open items will be available electronically from the Publicly Available Records System (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible from the NRC website at <http://www.nrc.gov/NRC/ADAMS/index.html>. Additionally, the public can provide comments to the Advisory Committee on Reactor Safeguards (ACRS) on the staff's review of the application in advance of the ACRS meeting.*

**Comment:** If you are going through all this different construction, right now, pre-construction, we are going to start widening the roads, we are going to start putting up traffic lights, and things, at this one intersection, so that we can get prepared. If the final Environmental Impact Statement hasn't been done, then why are you going ahead and beginning any kind of construction? Because if for some reason, as your draft goes through, and as you take comments from people, and you are going back through, and you are weeding out what needs to be done, what needs to be taken out, what needs to be improved, why are you doing construction now? (0011-87 [Hill, Carol])

**Response:** *Site preparation activities not related to nuclear safety, also termed pre-construction activities, may be performed by the applicant prior to the conclusion of the environmental review. The impacts of pre-construction activities will be addressed in Chapter 7 of the EIS. Applicants engaging in pre-construction activities do so at their own risk as NRC approval of an application for a COL is not a foregone conclusion. Safety issues as well as environmental issues will be evaluated before a decision on an application is reached.*

**Comment:** Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. (0037-10 [Thomas, Ruth])

**Response:** *Section 102(2)(C)(v) of NEPA requires that an EIS include information on any irreversible and irretrievable commitments of resources that would occur if the proposed action (approval of the COL) is implemented. These issues will be discussed in Chapter 10 of the EIS.*

**Comment:** Those drafting the EIS should make use of the testimony of the intervenors, not merely that of SCE&G, in the South Carolina Public Service Commission hearings on the VCSNS, Docket 2008-196-E, held in December 2008. A careful and frankly worded statement about the environmental hazards of VCSNS Units 2 and 3 is very important in supporting a rational decision on this project by the Nuclear Regulatory Commission. (0037-17 [Thomas, Ruth])

**Response:** *All scoping comments provided orally or submitted in writing are considered in the development of the EIS. Participation in hearings before the South Carolina Public Service Commission is a separate activity. Those participating in hearings before other agencies and those participating in the NRC hearing process are welcome to provide scoping comments as well.*

**Comment:** Any adverse environmental effects that cannot be avoided should the proposal be implemented. (0037-6 [Thomas, Ruth])

**Comment:** The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. (0037-8 [Thomas, Ruth])

**Comment:** Any of the environmental and economical solutions must have full technical supporting analysis. No longer should they ignore product (electricity) and distribution (network topology) system fundamental and initial studies. (0044-20 [Wojcicki, Joe])

**Comment:** All my calculations must be considered, and, if necessary, be adjusted or redone. All suggestions accepted, or corrected. In the new USA in the XXI Century, transparency is so significant especially for one of the first big nuclear projects. Avoiding discussion or being silent in the process of reviewing the application on the above topics, fully documented by scientific calculations, will have serious consequences for the entire nation. (0044-21 [Wojcicki, Joe])

**Comment:** An Initial set of documents and analysis is weak, unclear for serious discussions, and erroneous in their basic and fundamental Electric Energy Generation and Distribution part. It must be the set of inputs in starting an analysis to select a new reactors site. (0044-4 [Wojcicki, Joe])

**Comment:** The PSC Order was issued a short time after the end of the hearing, and the lack of understanding of the above three aspects led to wrong approval of Jenkinsville location, instead

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to force SCE&G to do the serious, professionally accurate rework on fundamental Electric Energy Generation and Distribution parts of their documentation. (0044-6 [Wojcicki, Joe])

**Response:** *These comments provide general opinions about the NRC's COL process, the application, and the South Carolina PSC Order and do not provide any information that can be used for the EIS development. The NRC will carefully review the application against its regulations that are intended to protect public health and safety and the environment.*

**Comment:** And a lot of people have gotten up here and spoken for SCE&G, and a lot of them have interests in SCE&G. I'm so glad that the Congress set your organization [NRC] up. I think if we are going to review what is going on, we need an independent body to review that. I'm so glad that we have you, because we are not competent to assess SCE&G's special interest, that is their interest, they do that, that is what they do for a living, they manufacture electricity, and they sell it, and they do a good job at it. And I don't want anybody to think that I'm pointing a finger at SCE&G, I'm just saying that they have an interest in this matter. And we have a right to have someone look at it that is not -- that doesn't have an interest, somebody that doesn't have a chance of being biased. (0049-33 [Lewis, Crosby])

**Response:** *This comment provides general information in support of the NRC review process for the COL. They do not provide any specific information related to the environmental effects of the proposed action and will not be evaluated in the EIS.*

**Comment:** We have some serious process problems. I understand that you want to do this in the community. However, the planning is very odd, in that this one was very reasonable, this is in Jenkinsville, this is a Tuesday night. But we are in the Bible belt. And so when is the next meeting they are planning? Thank you. That doesn't show sensitivity to the communities, at all. It does here, but for tomorrow night, who can come tomorrow night? I can't. And I doubt that other people who couldn't come tonight will be able to make it tomorrow night, either. So I would like to see the NRC do a better job planning, and dealing with the actual culture of South Carolina, and meet the people's needs whom you are purporting to serve. (0010-133 [Greenlaw, Pamela])

**Comment:** But first, until the NRC and SCE&G takes communication very seriously, I don't believe anything any of them are telling me. And the NRC, this goes for you as well. If we are going to have these meetings, please let us know. You know, if I knew there was an SCE&G kiosk, with information on it, down here at the park, at the Monticello Easy-Mart, I promise you I would stop and look for information being posted. It is not there. Now, folks, I'm not anti-nuclear power. But right now I'm anti-this, because I don't know what in the heck is going on, and I don't think we are being told fairly. (0011-109 [Hager, Richard])

**Comment:** I would actually like to second the mayor's comments. Just generally, and I don't think there are any bad intentions here. But it seems so often, with respect to big decisions that impact our communities, that the public kind of gets included in the conversation, in the 11th hour. And so really I just want to emphasize that to whatever degree the NRC, our utilities, can start to reach out into the community, essentially go door to door, and hold community meetings, hold meetings in churches, other meetings here at the school that aren't so formally structured, and where you are asking people what they want, and what they need, before you come in with a big proposal. (0011-14 [Ramsburgh, John])

**Comment:** I [John Ramsburgh, Sierra Club of SC] want to just say two things. That this process widen the parameters, make it as inclusive as possible; include as many topics as possible, especially topics brought here by people in the community. And that we get back to, I can't remember exactly how you said it, but you said it well, less formal, or more informal, and more informative, so that we really include the community in the process. (0011-21 [Ramsburgh, John])

**Comment:** We the people of my community [Jenkinsville, SC], are not educated on nuclear impact. You [NRC] asked us to come in on the impacts. Well, we don't know what 52 is, and all of that, again. So to come here tonight, and to give you an intelligent response, without the education that we need to do this, it is not, you know -- I listened to the slide a minute ago, and I was trying to be very attentive, and trying to really get something out of it. But I guess it went by kind of fast for me, because I still don't know what you guys really want, what do you want us to say; what do you want from us; what do you want me to go back to my community, to my constituency and say that they want us to tell them what impact it is going to have on the environmental thing? .....So we need you guys [NRC] to explain to us what the environmental impact is, how do we go about to find out exactly what that is? My number one concern is for the people in the town of Jenkinsville, we are on the front lines. We have lived 25 years with a nuclear plant. As far as we know everything is just fine. Now, am I against the nuclear plant that is coming in? I don't know. Am I for them coming in? I don't know. My thing is that I need to be more educated on exactly what is going to happen. (0011-5 [Ginyard, Gregory])

**Comment:** You know, the issue is what is the impact, environmental, what is the safety factors? You know, you guys are the professionals. This is good, but it should be a little more informal, it should be a little more informative. It should be broken down into the layman terms, so that we can understand it. Because the slides that went by here, the lady up there stood up, and she spoke about it. But when I look back here, she wasn't the only one that didn't get it, because I didn't get it either. And she was sitting beside me. And she said, well, I want them to know that we didn't really get that. But she's into the environmental thing, so she has done this, so she has kind of given me a little more insight on what is going on. But I'm saying to you, educate us. (0011-7 [Ginyard, Gregory])

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**Comment:** I live a mile, a mile and a half from the plant. That is by the highway. That is less than a half mile across the lake. We need to know. People in the area live closer than that to it. I'm their mayor, they are looking for me to be a voice for them, how can I be when I don't really know what we are doing? I really don't, I really don't know what we are doing. I can't support it, I can't not support it. And a lot of people are that way. This needs to be a little more informative, it needs to be a little more informed. There needs to be some really good information given to the people in layman terms, to understand, understand exactly what you guys are going to do. I understood, exactly, well you guys are the guys that check this out, do that, and you are going to send us a report back. But are we going to understand the report that you send back? We need some education to make us understand, so that we can understand. We are not slow, we can understand. But we need to be advised on what we are hearing. You know, we have other people here that have called me and said negative things. I've got people that call me saying positive things. I need to draw my own conclusions, so that I can talk to my people, my constituency, about it. So I say to you come back, and educate us in a better form, in a more relaxed atmosphere, and not in such a set slide show. Give us some -- break it down, tell us what we are doing. (0011-8 [Ginyard, Gregrey])

**Comment:** The real reason I'm here tonight is that I'm not convinced that these people from Washington understand that the people in this community haven't got it. They don't understand what you are doing. And I agree with the Mayor. They don't understand how to respond. As Ms. Rabb said, maybe they ought to read. A lot of them can't read. Maybe they ought to, but they can't. And these people need to be protected. What can they do? I submit, I read your -- the notice in the Federal Register just a while ago. And it talks about these public hearings. I submit to you that you haven't done your job, okay? You may have thought you did it, you may have gone through the steps, but it didn't get done. The bottom line, it didn't get done. At the bottom line the people in this community didn't -- don't understand what is going on, and didn't understand what they could do to have a comment. And they are entitled to have a comment. How do you resolve that? I'm not sure I know. I'm certainly not qualified to speak in that area, except to tell you that it would appear to me that there ought to be a series of discussions, pro and con, local discussions, informal as the Mayor said, where these people would hear both sides and have somebody say, well it is going to use up all the water in the river. And somebody comes back and says, it is not going to use up all the water in the river, it is only going to use X number of gallons, and we have these many gallons coming down. There needs to be some pro and con, on a practical basis, so the people can understand what is going on, and can come to some conclusion. That is really why I'm here. I love this community, and I love the people in it. I think they have a right to understand what is going on. They may not agree with me, but they have a right to understand. (0049-32 [Lewis, Crosby])



**Comment:** The educational aspect that Mr. Lewis talked about, I specifically said that last night, is that if we would just make it available, as to what is going on, in that facility, not only for us here to know tonight, but for our children that come along, if they had a method of just looking at that, and ascertaining what and how it works. That would go a long ways in making the people more understanding about what is going on. (0049-35 [Hendrix, Clifton])

**Response:** *An additional information meeting was held on March 28, 2009 to address community concerns. Scheduling of this meeting was done in conjunction with local community and church leaders.*

**Comment:** First it has been stated that we, the local citizens, can go online and download information from this agency and others. The problem with this is we don't have access to high speed internet here. We cannot possibly download these large document files, when we don't have access to an equitable distribution of services from AT&T, even though we have fiber optic cables running down in front of our houses. (0049-1 [Barnes, Jenifer])

**Comment:** But yet one lady talked about the internet, and I said that last night. Make sure that that be included as far as an impact to our people. Because if you can't access readily, and at a fast rate, as to what is going on around here, it is still going to be negative. She talked about AT&T, but on our end we have Verizon, and we can't get high speed internet up there, either. (0049-38 [Hendrix, Clifton])

**Response:** *Copies of the SCE&G Environmental Report and other relevant documents are located at the Fairfield County Library in Winnsboro, SC.*

**Comment:** There are certain real environmental and health, and security, and costs concerns with this plan. And with the whole state of South Carolina, we are at an energy crossroads, and we are trying to decide kind of which path we are going to go down. (0011-15 [Ramsburgh, John])

**Response:** *The NRC's responsibility is to regulate the nuclear industry to protect the public health and safety within existing policy. The NRC is not involved in establishing and administering energy policy.*

**Comment:** I don't have a lot of questions, except that this environmental review is a phantom, and it is kind of, like what they say, trying to nail Jello to a tree. Except this jello isn't even gelled yet, it is still liquid. (0010-141 [Greenlaw, Pamela])

**Response:** *The comments did not provide information related to the environmental effects of the proposed action and will not be addressed in the EIS.*

## D.2.2 Comments Concerning NEPA

**Comment:** And I'm here to, tonight, to challenge the NRC staff to live up to the mandate of the National Environmental Policy Act (0010-122 [Guild, Robert])

**Comment:** And I suggest to you that there is an inherent contradiction between the claim by the NRC, that they intend to embark tonight on a full and open compliance with the National Environmental Policy Act, and that they really care what we think about the environmental costs and benefits of this project.  
(0010-125 [Guild, Robert])

**Comment:** I would like to remind the NRC staff that in the year 2003 the Commission rejected a rulemaking petition brought by this industry, the Nuclear Energy Institute, asking the NRC to permanently ban consideration of the need for power, and of alternative and renewable energy issues, from the NEPA review process for new nuclear power plants. The industry took the position that we should just get past the charade of the NRC even worrying about whether power plants are needed, and whether there are more cost effective environmentally benign alternatives to nuclear power plants, to just eliminate the entire charade and simply, by fiat, dictate that nuclear power plants are good, and we will always choose that alternative. The Commission recognized, in 2003, that legally they could not do that, and they rejected the NEI petition. And they cautioned that when the Atomic Energy Commission, the NRC's predecessor, attempted to do this back in 1971, the Federal Courts mandated that the AEC and the NRC comply with the law. And I challenge you to do so again in 2009. (0010-127 [Guild, Robert])

**Comment:** I will close by saying the National Environmental Policy Act is enforced by the courts of the United States against the NRC and its predecessor, mandate that we not artificially narrow the scope of alternatives to be considered, so as to favor the preferred alternative. Everything I have seen, from the NRC staff's behavior so far, in the licensing proceeding smacks of that precise failure. And I submit to you that if you simply ignore the alternatives, fail to consider, fully, the environmental costs and benefits of this project, then the result of this review will be foreordained, and we all are wasting our time here tonight. (0010-132 [Guild, Robert])

**Comment:** In general terms I say it [EIS] should be broad, and it [EIS] should be deep. And I personally object to the fact that the first speaker, representing the Congressional Delegation, read a letter signed by all of them, that support the proposal to build nuclear power, they do not address the need for the NRC to conduct an objective analysis of the environmental impacts in accordance with both the spirit and the letter of the National Environmental Policy Act. That is what we are going to hold NRC's feet to the fire on. We want to see an objective analysis, we want to see one that is not just biased towards the industry's perspective on the role of nuclear power. (0010-78 [Hartz, John])

**Comment:** The information distributed at the scoping meeting in South Carolina in January 2009 indicated that the National Environmental Policy Act requires Federal agencies to use a

systematic approach to consider environmental impacts; that an Environmental Impact Statement (EIS) is required for major Federal actions that may significantly affect the quality of the human environment; and that issuing a combined license is considered a major Federal action. Based on the information discussed below, I believe that the VCSNS, if constructed and operated, would have significant negative effects on the quality of the human environment. Accordingly, I outline below what I believe to be the elements that should be included in the scope of the EIS, along with comments about some of these elements. The categories included below follow the wording of the National Environmental Policy Act. (0037-1 [Thomas, Ruth])

**Comment:** In the leading court decision regarding the National Environmental Policy Act (NEPA), *Calvert Cliffs' Coordinated Committee v. Atomic Energy Commission*, 449 F.2d 1109 (D.C. Cir. 1971), cert. denied, 404 U.S. 942 (1972), the Court made clear that in making decisions on major federal actions such as the issuance of a COL, the agency is compelled, to take environmental values into account. Perhaps the greatest importance of NEPA is to require [all] agencies to consider environmental issues just as they consider other matters within their mandates. This interpretation of NEPA requires that the NRC must balance environmental costs against the specific economic and technical benefits of the COL decision. The Court's decision in *Calvert Cliffs* also faulted the Atomic Energy Commission in that case for relying on certifications by other state and federal agencies that the applicant was in compliance with environmental standards. I urge the Commission to make a serious, independent environmental impact statement (EIS) of the VCSNS in this docket. In order for the environmental impact statement to be independent, it should not rely primarily on earlier analyses prepared by the applicant, SCE&G. (0040-1 [Thomas, Ruth] [Wilder, Ronald])

**Response:** *These comments are directed to the NRC licensing process with respect to NEPA for the VCSNS Units 2 and 3 COL, and provide no specific information for the NRC's associated environmental review. The licensing process for COL applications is specified in 10 CFR Part 52. The environmental review process associated with new reactor licensing includes a detailed review of an applicant's combined license application to determine the environmental effects of constructing and operating the nuclear power facility for up to 40 years. The NRC regulations implementing the National Environmental Policy Act (NEPA) are specified in 10 CFR Part 51. The NRC is an objective, independent regulator and is not biased toward the industry. After review of the application against the regulations and regulatory guidance, a hearing will be held on uncontested issues (and, if necessary, contested issues) to determine whether it is appropriate to grant the license. NRC approval of an application for a COL is not a foregone conclusion. Safety issues and environmental issues will be evaluated before a decision on an application is reached. As described in the regulations, the NRC can deny an application based on the finding of its review.*

**Comment:** The great thing about this process, and the great thing that is happening with a lot of our federal regulatory agencies, is that they are starting to widen the discussion, in terms of the parameters. And I know that on the slide show they were going to --the presentation is about the environmental impacts. But we don't have to think about the environmental impacts just in terms of the squirrels and the mice, we think about the human environmental impacts. (0011-16 [Ramsburgh, John])

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**Response:** *NRC has an obligation under NEPA to identify and disclose the socioeconomic impacts of major Federal actions it undertakes. Both environmental and socioeconomic impacts will be analyzed in the EIS.*

**Comment:** And I think this Environmental Impact Statement process, and maybe the NEPA regulations of the department need to take into account this new directive from our president. (0011-72 [Clements, Tom])

**Response:** *These comments relate to how the NRC implements the requirements set forth within NEPA. They provide no specific information related to the current licensing action and will not be evaluated in the EIS.*

### D.2.3 Comments Concerning Site Layout and Design

**Comment:** Lastly I would ask that you consider the true cost of the AP1000 reactor. As others have said, the reactor of that design has never been built. And, indeed, the NRC currently has -- Mr. Clements, of Friends of the Earth, stated that design certification is now in its 17th design revision, with no firm schedule by the NRC, for completion of that design review. That is, precisely, that lack of a certain design is precisely the dynamic that created the collapse of the nuclear industry 30 years ago, with massive cost overruns, and canceled plants, because each plant was designed as it was being built. And I submit that that is likely to happen here tonight. (0010-132 [Guild, Robert])

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: A fact-based analysis regarding estimated costs for the second and third plants proposed for Fairfield County, South Carolina. This analysis should consider likely future costs of raw materials (e.g., steel and concrete) that would be required for construction. (0035-7 [Zia, Barbara])

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: The number of attempts to date, their costs, and the status of proposals to construct plants of similar design. Because this particular design has not been constructed elsewhere, this must be a comprehensive report. (0035-8 [Zia, Barbara])

**Response:** *The disclosure of the costs of the proposed action will rely on the best available estimate of financial costs with uncertainties noted. Associated costs that cannot be reliably quantified also will be discussed. Chapter 10 of the EIS will address the estimated overall internal and external benefits, costs, and associated environmental impacts of the proposed project.*

**Comment:** SCE&G has chosen a risky reactor design. The AP1000 has never been built anywhere, and the final design is years away from approval by the NRC. (0010-118 [Cooper, Elaine])

**Comment:** But I have to say this, just common sense tells me that it is really difficult to have an environmental plan on something that doesn't exist. There is not even a demonstration model planned.....And if we are supposed to be analyzing the environmental impact of something that doesn't exist, would you give your child that kind of homework? This, to me, just seems insane. So we have an Environmental Impact Statement, or environmental study on theory. Okay, that is the best we can do. If that is the best we can do, what can we do to move forward? Well, the legislature decided that, okay, we are going to move forward with this, we are going to put in place the Baseload Review Act, and you only get an opportunity for one prudence review. And once the Public Service Commission decides to move forward, folks, there is no going back. The Legislature has said you will pay, you will pay, you will pay if PSC says let's go ahead. Now, I know that you are being told that you are going to pay interest only first. And then they are going to sock us with the capital after they got them built. Well, we are back to square one, with how do we know what the environmental impact is? I'm sorry, this just seems insane to me. So I have real problems with this process. (0010-134 [Greenlaw, Pamela])

**Comment:** And so I really, I think if I were in the NRC, I would have to get people together and say, we have to stop, we have to slow some of this down and say, we need to have someone who will do a demonstration model for each of the new types of reactor designs that are coming out. There are basically three, I think; AP1000 is one of them. And let there be a prototype for developing these systems, these kinds of tests that we want, environmental and safety. (0010-138 [Greenlaw, Pamela])

**Comment:** This talk about the design not existing, is a farce. The design is an evolutionary design, based on all the best lessons learned, and advances in technology, over the last 40-plus years. The design is based on an earlier design, the AP600, which received design approval in the early to mid-1990s. There were facilities built at Oregon State to test the evolutionary and new advances in the thermohydraulics for the AP600 design. So it is a proven design, it is an evolutionary design, again, built on the best technology that exists. The AP1000 received its own approval in 2005, and the comments they are making have to do with certain revisions to that design. But the fact that it is not based on good, existing technology, is utterly -- it is an utter farce. (0010-174 [Knight, Travis])

**Comment:** As far as the AP1000 reactor design, there was a question if this is the same kind of reactors. These reactors do not exist, they are only on paper. The Nuclear Regulatory Commission has certified the design. That doesn't mean they are approved. It is not going to be until 2010, or 2011, that the reactor design is finalized. So we are looking at an EIS process where we don't even know what the reactor is, basically. There is a general design of it, but there are a lot of details that are being reviewed, and there is not even an established review schedule to finalize the reactor design. I don't think this EIS process should go forward until we know exactly what kind of reactor is going to be built at the site. (0010-48 [Clements, Tom])

**Comment:** I wanted to make sure that people caught that this reactor has never been built anywhere in the world. The AP1000 reactors have never been built. It appears that SCE&G is on a fast track course, and may have some kind of special deal with the Westinghouse Company to build these reactors here. So this is a kind of a test project. And you that live

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close.....you are going to be guinea pigs for this project, and you need to be quite attentive as this whole thing is going on. (0011-73 [Clements, Tom])

**Comment:** It is our understanding that the design of this facility has not been proven to be viable. The documentation regarding this provided by the NRC shows that the final design has not even been approved. (0041-14 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Response:** *NRC regulations do not require that applicants refer to a certified design in a COL application. However, the applicant must furnish sufficient information for NRC staff to independently evaluate the potential impacts of construction and operation of a new nuclear power plant at a given site. The level of detail required is illustrated in NRC Environmental and Siting Regulatory Guides 4.2 and 4.7, as well as in NUREG-1555 Environmental Standard Review Plans for Nuclear Power Plants (available on the NRC website). Regarding concerns over the viability of new reactor designs, their approval is contingent on the rigorous safety review of the design control document (DCD) and their construction is verified by inspections, tests, analyses and acceptance criteria (ITAAC) prior to initial testing and operation. These comments do not provide any information that can be used in the development of the EIS and will not be addressed further.*

**Comment:** It is time we rejected the fear and superstition that anti-nuclear activists have tried to thrust upon the public. Today's nuclear power plant designs are inherently safe, adding to an already perfect safety record established in the last six decades. (0010-108 [Wolfe, Clint])

**Comment:** The V.C. Summer site was originally designed to accept more facilities, and with the existing power grid already there, the current operation, the expansion is natural, low-cost, and a low environmental impact to meeting the growing electrical need of South Carolina. The design of the new generating unit, the AP1000, which they have applied for, is a simplified plant design that standardizes and reduces the cost of building this facility. (0011-45 [Rudnicki, Steve])

**Comment:** But because this is a very first project, they are going to apply very new generation of reactors, AP1000, designed by very good company called Westinghouse. (0011-66 [Wojcicki, Joe])

**Response:** *These comments provide general information in support of the applicant's COL. They do not provide any specific information related to the environmental effects of the proposed action and will not be evaluated in the EIS.*

**Comment:** And there is no safety record on the AP1000 regardless of the safety record that they have on Summer 1. They can't possibly have a record on the AP1000. They have to develop that. (0010-135 [Greenlaw, Pamela])

**Comment:** You know, this is based on theoretical models, it can't be tested. And so we are also supposed to have, from what I understand, a safety review, is that correct? How can you

have a safety review on something that doesn't exist [AP1000 reactor]? (0010-137 [Greenlaw, Pamela])

**Comment:** SR2 [My concern(s) about the two proposed reactors is/are] 2 reactors that have not been test [sic] Closing in of our property. (0051-4 [Respondent, Community Survey])

**Response:** *The issues raised in these comments are safety issues, and as such, are outside the scope of the environmental review and will not be addressed in the EIS. A safety assessment for the proposed licensing action was provided as part of the application. The NRC is developing a safety evaluation report that analyzes all aspects of reactor and operational safety.*

**Comment:** They [Florida] are, already, trying to build exactly the same time two reactors AP1000, but they are located on the Gulf of Mexico. And they are going to use the seawater to the cooling, not the water from the people that need to drink, from the animals that they need to drink, and from the farmers that they need to plant and produce the food for the people. (0010-94 [Wojcicki, Joe])

**Response:** *This comment refers to water use by AP1000 reactors proposed for a different location. Water use impacts of construction and operation the proposed Units 2 and 3 will be evaluated in Chapters 4 and 5 of the EIS, respectively. Cumulative impacts will be addressed in Chapter 7 of the EIS.*

**Comment:** But I'm very bothered by something he said tonight, that he had said earlier in the proceedings, and that is that, hopefully, if the AP1000 works as designed, which of course we still don't have the final revision of yet, they have sufficient water to run it for two months with drought or no drought. What happens after two months? I don't know. Okay, and I'm not sure they do either. It is a cool design, I have to say. Because it is not just water cooled, there is some liquid nitrogen involved in this. This is really unique. (0010-135 [Greenlaw, Pamela])

**Response:** *The construction and operation of a nuclear plant involves the consumption of water. The staff will independently assess the impact of these consumptive water losses on the sustainability of both the local and regional water resources. This assessment will consider both current and future conditions, including changes in water demands to serve the needs of the future population, and changes in water supply. While the NRC does not regulate or manage water resources, it does have the responsibility under NEPA to assess and disclose the impacts of the proposed action on water resources. The staff's assessment of the impacts on the sustainability of water resources will be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively. Cumulative impacts will be addressed in Chapter 7 of the EIS. In addition, staff will evaluate system design alternatives, including cooling water system design, in Chapter 9.*

#### D.2.4 Comments Concerning Land Use - Site and Vicinity

**Comment:** Now, what are we going to expect here as the owners of the property, of the residents of this place? If you have to say that the property, the value of the property is going to be decreased, it is for sure. (0010-83 [Wojcicki, Joe])

**Comment:** SR148 [My concern(s) about the two proposed reactors is/are] our community Dawkins will be history (0050-69 [Respondent, Community Survey])

**Comment:** SR79 When the V.C. Summer plant was first built, SCE&G forced many property owners along the Broad River, under threat of condemnation, to sell their property. SCE&G's reasoning was that these properties would be flooded when the plant was built. Many of the deeds from these property owners to SCE&G even have the wording that the property owners giving up their property would be guaranteed access to the water at all times. Many of these properties were as far as 12 miles north of the actual plant. The reality since the plant was built is that these properties are not flooded and flooding is actually not as much of a problem as before the plant was built. These properties now are nothing but hunting club properties for employees, executives and guests of SCE&G. SCE&G has also made large profits from the harvesting of timber on these properties - profits that would rightfully have been made by the landowners if they had not been forced to sell their land. Are there any plans to rectify this situation and compensate these land owners by returning the properties to these owners or their heirs. (0051-74 [Respondent, Community Survey])

**Response:** *Environmental justice impacts are those environmental impacts that disproportionately affect low-income and minority populations, or that impact subsistence practices or unusual resource dependencies. Environmental impacts include many physical, social, community, demographic, and economic impacts - including employment and tax revenue impacts. Chapters 4, 5, and 7 of the EIS will address all of these types of impacts. Redressing the grievances of participants in real estate transactions is outside the NRC's regulatory jurisdiction.*

#### D.2.5 Comments Concerning Land Use - Transmission Lines

**Comment:** The second, if we are going to move this location to this area, what are we going to do? We are going to save a lot of building of transmission lines. So this is distribution system for the protocol electricity. (0010-85 [Wojcicki, Joe])

**Comment:** ...it was mentioned that it would be problem with building this transmission line here, because the line from Jenkinsville to the prospective huge load close to the Savannah, required about an extra 200 miles of the transmission line, and we need to find the corridors for this one. And it is almost impossible to find this place around Columbia. So there would be very big problem. (0010-86 [Wojcicki, Joe])



**Comment:** The COL [Environmental Report] provides a broad overview of existing and proposed transmission line corridors. Final routes will be identified in the upcoming Phase 3 transmission line study. DNR requests consultation throughout Phase 3 and the final route selection process. (0036-5 [Vejdani, Vivianne])

**Comment:** The Jenkinsville site location did not consider at least three aspects...Much higher distance from Jenkinsville to Charleston & AOL large load locations, that will require more MW base load (24/7) for the SE electric network / grid. To fulfill future needs of AOL, unnecessary and additional long distance transmission lines must be built from Jenkinsville to Charleston area and farther to JOT. (0044-2 [Wojcicki, Joe])

**Comment:** SR1 [My concern(s) about the two proposed reactors is/are] The transmission of nuclear energy from the two new plants to customers (increase number of powerlines).. (0051-1 [Respondent, Community Survey])

**Response:** *Potential land-use impacts to the site, vicinity, and off-site areas from construction and operations activities will be addressed in the Chapters 4, 5, and 7 of the EIS. Cumulative impacts related to transmission-line corridors, will also be addressed in the EIS.*

## D.2.6 Comments Concerning Meteorology and Air Quality

**Comment:** Is there a possibility of condensation of vapor from the cooling towers posing a potential driving hazard on surrounding highways since the cooling towers will be located so closely to them? (0041-13 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Response:** *The NRC staff will evaluate the effects of the cooling tower plumes associated with the new units following the guidance described in NUREG-1555. The standard computer model used in this analysis is the Seasonal-Annual Cooling Tower Impact Prediction Code, which is explicitly designed to represent cooling tower plumes. Analysis results will be presented in Chapter 5 of the EIS.*

**Comment:**

SR88 [My concern(s) about the two proposed reactors is/are] I think it would be unsafe to the community if something would happen it may cause chemicals to spread in the air. (0050-9 [Respondent, Community Survey])

**Comment:** SR182 [My concern(s) about the two proposed reactors is/are] air quality. (0052-11 [Robin, Ella])

**Comment:** SR183 [My concern(s) about the two proposed reactors is/are] air quality. (0052-13 [Robinson, Terria])

**Comment:** SR184 [My concern(s) about the two proposed reactors is/are] air quality. (0052-15 [Robinson, Claude])

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**Comment:** SR185 [My concern(s) about the two proposed reactors is/are] Air quality (0052-16 [Respondent, Community Survey])

**Response:** *The airborne emissions from the proposed Units 2 and 3 will be considered in the evaluation of potential impacts. The impacts on air quality resulting from construction and operation of proposed Units 2 and 3 will be discussed in Chapters 4 and 5 of the EIS. The impacts of nuclear power generation on climate change will be addressed in Chapter 7 of the EIS.*

**Comment:** The meeting here tonight is about environmental aspects. And compared to other baseload generation, that is reliable, that being coal, it is important to note some important facts. Each of these plants will displace seven million tons of CO2 per year. In a carbon trading environment, should we have one, which was discussed in the last Congress, this is worth about 160 million dollars per year, at present value. Also each plant will also displace 42,000 tons of sulphur dioxide per year, as well as 12,000 tons of nitrous oxide per year, improving air quality, helping us all breathe a little bit easier. (0010-175 [Knight, Travis])

**Response:** *The comment provides general information about the potential offset of coal power plant emissions through the operation of a nuclear plant. Chapters 4 and 5 of the EIS will discuss air quality impacts, with the specific impacts of greenhouse gas emissions being addressed in Chapter 5. Alternative sources of energy (including environmental impacts of reasonable energy generation alternatives) will be discussed in Chapter 9 of the EIS.*

**Comment:** with the weather coming from the west, thunderstorms are strong, but they are small. And I believe that has added to our drought. Columbia has the bottom of Lake Murray splashing through the river, and it is 25 degrees warmer, and they get lots of thunderstorms we miss. The year before last they got two and a quarter inches of rain in six months. And this happens in the summer. And I think with two more nuclear power plants with these big ugly towers, and steam coming out, it may never rain here again in the summertime. (0011-103 [Mason, Corry])

**Response:** *The NRC staff will examine both onsite and regional meteorological averages and extremes, including severe weather phenomena and air quality conditions, to establish whether the data used by the applicant are representative of site conditions and adequate for assessing the effects of station construction and operation on the environment. Results from the meteorological evaluation will be presented in Chapter 2 of the EIS.*

**Comment:** As an economic developer, it is also important to me that nuclear power is clean, and generates electricity virtually emissions-free, maintaining Newberry County's attainment status with respect to air quality. (0010-14 [Powers, Theresa])

**Response:** *This comment expresses an opinion about nuclear power plant emissions and does not provide any specific information that can be used for the environmental review.*

### D.2.7 Comments Concerning Geology

**Comment:** The Pax Mountain Fault System runs very near Jenkinsville, SC. As a consequence, multiple earthquakes have been known to occur in the general vicinity of the VC Summer Nuclear Station. The earthquakes of April 20, 1964, and of May 19, 1971, are a few of the earthquakes attributed to the Jenkinsville area. Additionally, just last month two more earthquakes (March 18 and March 19, 2009) were attributed to Peak, SC -directly across the Broad River from Jenkinsville. Is the potential for seismic events being taken into consideration when determining whether or not more reactors should be placed here? (0041-18 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** Also, could the blasting at the granite and gravel quarry in Blair have an increase in threat for seismic events to occur in this area? (0041-19 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Response:** *The EIS will contain a short description of local geology. Geotechnical and seismic issues are addressed in Section 2.5 of the NRC staff's Safety Evaluation Report.*

### D.2.8 Comments Concerning Hydrology - Surface Water

**Comment:** In our V.C. Summer location 94 percent of all the water that we take out of the Monticello reservoir is non-consumptive use, it goes back there. That remaining roughly 5 or 6 percent is what is evaporative losses. Our new units will use only the equivalent of about one percent of the average annual flow of the Broad River. (0010-101 [Byrne, Stephen])

**Comment:** Reactors will use millions of gallons of water a day, affecting the flow of the Broad River. (0010-116 [Cooper, Elaine])

**Comment:** And there is also the issue of water depletion. We have been in a drought, in South Carolina, and especially in this area, along the Broad River, for several years now. There is the one nuclear reactor, Duke Power is proposing two new nuclear reactors upriver. And in addition to these two, that are proposed, that would be five nuclear reactors all being cooled by the water from the Broad River and the reservoir. Now, if there is not enough water to sufficiently cool the plants, then all that -- you can't generate the energy, and it is a real issue of what will happen to these rivers with so many power plants. (0010-22 [Berg, Michael])

**Comment:** Somebody mentioned how many gallons, billions of gallons of the water is going to evaporate from the cooling system, a lot of them. I just make a very simple calculation. I would tell you that just these two reactors, forget about the Duke Power reactors, somewhere in Cherokee County, this is going to take the water from about two million people, or it is going to take the water from over a quarter of million of farms, the farms that are going to create the food for us. (0010-90 [Wojcicki, Joe])

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**Comment:** The second, we are going to save the water.

You don't probably realize what is going to happen if we are going to put the units here in Jenkinsville. Also, South Carolina Electric and Gas failed to show us the balance of the water. Also, with this regard, another two reactors they are going to build, Duke Power somewhere, in the Broad River. So we are going to, probably, already have much less water because Duke Power is going to take the water on the beginning, we are not going to have water in South Carolina, in the midlands. (0011-62 [Wojcicki, Joe])

**Comment:** Now, what happen if we don't have the water, enough water? Who is going to be first to be disconnected from the source of the water, farmers, residential houses, schools, golf courses, churches and synagogues, judicial administration buildings, hospitals, day cares, nursing homes? (0011-64 [Wojcicki, Joe])

**Comment:** And my question to the NRC is, there are two other lakes, Lake Murray, and Lake Wateree, which are a lot larger, and in a better populated, higher income area. Why couldn't the nuclear reactors be located over there? I think those two lakes would be enough to supply water for the next 20, 30, 40, 50 years that the nuclear reactors are going to have to have, that type of water to supply the power to it. I don't believe that the area over here is large enough, that Lake Monticello is large enough to facilitate those nuclear reactors. (0011-84 [Hill, Carol])

**Comment:** Additionally, water usage is minimal when put in the proper context. Nuclear plants that use cooling towers, such as the two future units at V.C. Summer, would consume the equivalent of 20 to 26 gallons of water per day per household. By comparison, according to the USGS, an average three person household in the U.S. consumes approximately 300 gallons of water per day. (0033-3 [Merrill, Denver])

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: A study of the adequacy of surface water from the Broad River to supply the demands of communities and industries, especially during drought conditions. The analysis should include demands of current and proposed coal and nuclear plants along the Broad River. (0035-9 [Zia, Barbara])

**Comment:** This section [COL Application, Part 3, Environmental Report Section 2.3.1.1.4] provides a very general overview of the operation of the reservoirs and FPSF, stating that pumping is normally done at maximum capacity. There is no information on whether operation is modified during times of low flow. Is pumping curtailed during times of extreme low flows? Is operation of the Parr hydro facility modified during low flows? Information on how water is apportioned between reservoirs, the FPSF and the Broad river, particularly during low flow periods, is needed. If no provisions exist, then a drought response plan will need to be developed in consultation with regulatory and resource agencies. (0036-10 [Vejdani, Vivianne])

**Comment:** On page 2.3-21 the COL [Application, Part 3, Environmental Report] indicates that the licensee intends to request a license amendment of the Parr hydro project for increased water withdrawals for the operation of Units 2 and 3. Licensed flows for the Parr Hydro project

are 1,000 cfs or average daily natural inflow (less evaporation) during the striped bass spawning season of March, April and May, and 800 cfs (less evaporation) for the remainder of the year, with a minimum instantaneous flow release of 150 cfs. Estimated evaporative loss from Unit 1 alone is estimated at between 8.7% to 15% of the licensed minimum instantaneous flow of 150 cfs. Increased evaporative loss from the addition of Units 2 and 3 could have significant impacts on downstream flows, particularly during times of low flow. The state of South Carolina continues to experience drought conditions of unprecedented severity and duration. As of this writing, the entire state is in drought status ranging from "incipient" to "extreme." This fact underscores the supreme importance of carefully and thoroughly evaluating the hydrological impact of the proposed expansion. (0036-12 [Vejdani, Vivianne])

**Comment:** The COL [Application, Part 3, Environmental Report, Section 10.5.2] indicates that during low flow periods the additional consumptive water loss associated with Units 2 and 3 would be mitigated by removing water from the reservoirs rather than directly removing water from the Broad. The COL also identifies the Lee Nuclear plant as a future upstream water user, adding that cumulative impacts of VC Summer and Lee nuclear plants will be small with the addition of any water supply features and mitigation measures. However, the COL [ER] does not indicate how water is to be allocated between the reservoirs and river, or how operation of the Parr project and FPSF will be modified, to mitigate low flows. The COL indicates a minimum reservoir elevation of 418 ft. What are the operational or physical constraints on minimum reservoir elevation? As stated above, it is of extreme importance that issues of water supply during low flows are thoroughly addressed and appropriate mitigation measures are clearly identified, in consultation with regulatory and resource agencies, during the licensing process. (0036-19 [Vejdani, Vivianne])

**Comment:** The [Broad] river is also an important water supply resource for municipalities, hydropower and various industries. (0036-4 [Vejdani, Vivianne])

**Comment:** The COL [Application, Part 3, Environmental Report] refers to the calculation of mean daily and mean monthly flow in the Broad River using the Richtex, Alston and Carlisle USGS stream gauges. However, it is unclear what methods or additional data were used to estimate inflow into the Parr Reservoir. Were flows estimated using a combination of USGS gauge flow data, scaled down to the drainage area of the reservoir, or were they estimated with a water balance equation? A complete description of methodology is needed to evaluate flow estimates provided in the COL [Environmental Report] . (0036-6 [Vejdani, Vivianne])

**Comment:** The COL [Application, Part 3, Environmental Report or ER] describes a seven-day average low flow of 156 cfs calculated from 2002 flow data from the Alston gauge, located approximately 1.2 miles downstream of Parr Shoals Dam. A 100-year daily mean flow of 125 cfs, and a 100-year seven-day average low flow of 430 cfs were also calculated for the Alston gauge. The seven-day average low flow at the Parr dam was estimated to be 190 cfs, also in 2002. A 7Q10 flow equaling 853 cfs was estimated from data from the Richtex and Alston gauges. There is no information on historical or estimated low inflow to the Parr Reservoir other than that provided from the Carlisle gauge, 21 miles upstream of the project site. According to the COL [ER], historical daily mean flows in the Broad River at the Alston gauge have been as

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low as 48 cfs (2002). The COL [ER] adds that this flow was not considered representative of natural river flows because it was influenced by the upstream flow diversion from the Parr Reservoir to Fairfield Pumped Storage Facility. This statement seems to suggest that downstream flows are run-of-river and not regulated by the operation of the Parr project and Fairfield Pumped Storage Facility (FPSF). (0036-7 [Vejdani, Vivianne])

**Comment:** The COL [Application, Part 3, Environmental Report] states that the state of South Carolina uses the 7Q10 flow to determine potential impacts. This statement is misleading. The South Carolina Department of Health and Environmental Control uses the 7Q10 of a water body to determine the assimilative capacity of that water body when setting limits to effluents in National Pollutant Discharge Elimination System permits. DNR follows the guidelines of the South Carolina Water Plan (second edition, 2004) when evaluating potential impacts to state water resources. ([www.dnr.sc.gov/water/hydro/water\\_plan.htm](http://www.dnr.sc.gov/water/hydro/water_plan.htm)). (0036-8 [Vejdani, Vivianne])

**Comment:** The COL [Application, Part 3, Environmental Report] states that the pan evaporation loss rate from the Parr Reservoir was estimated from data obtained from DNR, but the exact source of this data is not identified. In addition, there is no information provided on how evaporative loss was estimated for the Monticello Reservoir. Complete information is needed on the data and methods used to estimate pan evaporation loss rates for Parr and Monticello reservoirs. (0036-9 [Vejdani, Vivianne])

**Comment:** Water quantity, water quality and water temperature effects of the VCSNS on the Broad River, and downstream effects on the city of Columbia and the Congaree National Park. Water quality issues were raised by intervenors in the South Carolina Public Service Commission hearings on the VCSNS held during December 2008. The city of Columbia obtains a large fraction of its water supply from the Broad River downstream of the VCSNS (0037-2 [Thomas, Ruth])

**Comment:** The operation of the VCSNS will stress water resources in South Carolina and add radioactive contaminants to the environment. Use of the energy efficiency and renewable energy alternatives will serve long-term productivity to a much greater extent. Intervenors in the SCPSC hearings raised serious questions about the stress on water resources and pointed out that alternative locations on the Atlantic Ocean would avoid the water quantity concern. (0037-9 [Thomas, Ruth])

**Comment:** Also, Midcounty Water is reportedly constructing a pipeline to the Broad River with the intent to extract river water for filtration into drinking water for the Winnsboro area. Will consideration be given to the impact on the capacity of the Broad River and its impact on available drinking water for the communities and cities downstream? (0041-7 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** The second point would be the drought. We are in a drought, and nuclear power plants use a lot of water. There is, currently, a bill in the state house, which is expected to pass this year, regarding water allocation. It will limit large withdrawals, that is three million gallons

per month or more. That may seriously impact the ability to construct this plant, okay? (0049-40 [Hartmeier, Gina])

**Response:** *These comments refer to the consumptive use of water. The construction and operation of a nuclear plant involves the consumption of water. The NRC staff will independently assess the impact of these consumptive water losses on the sustainability of both the local and regional water resources. This assessment will consider both current and future conditions, including changes in water demands to serve the needs of the future population, and changes in water supply. While the NRC does not regulate or manage water resources, it does have the responsibility under NEPA to assess and disclose the impacts of the proposed action on water resources. The staff's assessment of the impacts on the sustainability of water resources will be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively. Cumulative impacts will be addressed in Chapter 7. In addition, staff will evaluate system design alternatives, including cooling water system designs, in Chapter 9.*

**Comment:** Increased use of, and warming of, scarce water resources are irreversible; furthermore warming trends in the environment exacerbates these effects. (0037-13 [Thomas, Ruth])

**Comment:** Is the carrying capacity of Lake Monticello large enough to mitigate the cooling needs of two additional reactors? (0041-1 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** Will the Broad River be able to meet EPA Safe Drinking Water Standards and still remain a viable ecosystem throughout long periods of drought? (0041-8 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** The Jenkinsville site location did not consider at least three aspects...Necessary enormous volume of cooling water (over 40 million extra gallons per day) to be taken from the Broad River located in the Southeast (SE) drought region of the USA. (0044-1 [Wojcicki, Joe])

**Comment:** The last years' drought and heat wave events in Europe as well as in the SE of the USA must be considered, including their influence on nuclear reactor operation and SC people and industry. Be aware of specifics of water supply from the Broad River and the Greater Columbia area and SC Midlands needs. (0044-14 [Wojcicki, Joe])

**Comment:** How will the additional demands on the capacity of the Broad river impact the availability of drinking water for the communities and cities that are downstream? With the increase in industrial demand, will the Broad river be able to meet EPA safe drinking water standards, and still remain a viable ecosystem throughout long periods of drought? (0049-5 [Barnes, Jenifer])

**Comment:** SR143 [My concern(s) about the two proposed reactors is/are] Water pollution (0050-58 [Respondent, Community Survey])

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**Comment:** SR11 [My concern(s) about the two proposed reactors is/are] Will our waters and soil be safe. (0051-17 [Respondent, Community Survey])

**Comment:** SR185 [My concern(s) about the two proposed reactors is/are] water pollution. (0052-17 [Respondent, Community Survey])

**Response:** *Staff will consider impacts of the construction and operation of the plant on water quantity and quality including temperature (thermal impacts) in Chapters 4 and 5 of the EIS.*

**Comment:** ...about the drought here. And what will happen if for some reason we are going to have the high temperature in the [drought period]-- it will be necessary to shut down the reactors. You are not going to have electricity, but the reactors still will not have water to cool them down. So it is terrible solution to put these two guys here. (0010-93 [Wojcicki, Joe])

**Comment:** What is going to happen if we are going to have a drought? And, already, NRC already have the map which show 24 existing reactors, in the area in the southeast, in the area they call drought zone. That means if we are going to have drought, or very high temperature, we have to shut down the reactors. (0011-65 [Wojcicki, Joe])

**Response:** *These comments generally express concern about the impacts of drought conditions necessitating a shutdown of the proposed Units 2 and 3 without sufficient water to safely do so. The EIS evaluates the potential effects of plant construction and operation on the environment. Therefore, these comments are not within the scope of the environmental review. The staff's Safety Evaluation Report will address the effects of drought on the plant. Nuclear power plants are extremely robust structures that are designed to safely shut down when necessary. If an extreme drought event causes the nuclear power plant to be shut down, the reactor can be maintained in a safe condition.*

**Comment:** And we will have low-rise, not big-tall, but low-rise cooling towers for our new units, so as not to increase the temperature of the Monticello reservoir. So we are being good stewards of the environment. (0010-102 [Byrne, Stephen])

**Comment:** And the water, is it like ten degrees warmer than it is supposed to be? (0011-102 [Mason, Corry])

**Comment:** The CORMIX model was used to model the extent of the thermal plume that would exceed applicable SCDHEC water quality standards of  $T > 90^{\circ}\text{F}$  or  $\Delta T$  of  $5^{\circ}\text{F}$  above ambient river temperatures. A variety of scenarios were modeled using input flows synthesized from Carlisle and Alston gauge flows. The "worst case scenario" was identified as follows: 2 cycles of concentration through cooling towers, 7Q10 flows, no operation of the FPSF, and max- $\Delta T$ (winter). The extent of the plume resulting from these conditions was modeled to be  $\sim 0.30$  to  $0.40$  acre and would extend  $\sim 25\%$  of the reservoir's width. Inflow to the Parr reservoir has been considerably lower than the modeled 7Q10 flow. ....DNR requests additional consultation on the analysis of thermal impacts for low-flow conditions. (0036-17 [Vejdani, Vivianne])



**Response:** Chapters 4 and 5 of the EIS will describe the methods and results of the evaluation of water-quality impacts from the construction and operation of the proposed action. Impacts to Monticello Reservoir, Broad River, and Parr Reservoir will be considered. The NRC staff will include consideration of heat, nutrients, and other pollutants. Because the State of South Carolina is the primary regulatory authority over water quality, NRC staff will work closely with state agencies. Because water-quality actions also have an impact on aquatic ecology, the NRC staff will closely coordinate these reviews.

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: Statistical analysis of the evaporation in terms of the estimate of 80 million gallons a day that was made by Tom Clements with Friends of the Earth. (0035-10 [Zia, Barbara])

**Response:** Chapters 4 and 5 of the EIS will describe the methods and results of the evaluation of water-quality impacts from the construction and operation of the proposed action. . Impacts to Monticello Reservoir, Broad River, and Parr Reservoir will be considered. The NRC staff will include consideration of heat, nutrients, and other pollutants. The water budget on which the analysis is based includes the analysis of evaporative losses from these water bodies. Because the State of South Carolina is the primary regulatory authority over water quality, NRC staff will work closely with State agencies. Because water-quality actions also have an impact on aquatic ecology, the NRC staff will closely coordinate these reviews.

**Comment:** Two water intakes and one discharge are included as lake impacts. A raw water intake and a water treatment plant intake will be constructed in the Monticello Reservoir. Construction of the raw water intake will be accomplished in the dry with the assistance of a sheet pile coffer dam surrounded by silt curtains. The applicant has proposed to pump silt-laden water from behind the coffer dam into the space between the coffer dam and the silt curtain. Rather than pumping silt-laden water directly into Monticello, water should be filtered to remove silt and sediment before it is returned to the reservoir. (0036-16 [Vejdani, Vivianne])

**Response:** The construction and operation of a nuclear plant involves some discharges to nearby water bodies. The Clean Water Act designated the EPA as the Federal agency with responsibility for effluent discharges to the nation's waters. While the NRC does not regulate effluents other than radiological effluents, it does have the responsibility under NEPA to assess and disclose the expected impacts of the proposed action on water quality throughout the plant's life. The staff's assessment will determine whether the designated uses of the local and regional water supplies are jeopardized by the construction or operation of a nuclear plant at the proposed site. The staff's assessment of the nonradiological impacts to water quality will be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively.

## D.2.9 Comments Concerning Hydrology - Groundwater

**Comment:** All residents in the western part of Fairfield County currently receive their drinking water from groundwater -be that through private wells or through wells operated by the

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Jenkinsville Water Company. With triple the potential for groundwater contamination, what assurances will be given to the citizens of the surrounding area that the groundwater will remain safe? Are additional monitoring wells going to be required? (0041-6 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** With tripling of the potential for contamination, by adding two more reactors, what steps will be taken to assure the citizens of the surrounding area, that the groundwater is safe? Are additional monitoring wells going to be established? (0049-6 [Barnes, Jenifer])

**Comment:** SR124 [My concern(s) about the two proposed reactors is/are]possible effects of ground water contamination (0050-42 [Respondent, Community Survey])

**Response:** *Groundwater monitoring will be addressed in EIS Chapter 2 (pre-application hydrologic and water-quality monitoring), EIS Chapter 4 (construction hydrologic and water-quality monitoring), and EIS Chapter 5 (operational hydrologic and water-quality monitoring, radiological monitoring). The applicant proposes expansion of the current groundwater-monitoring network for the additional units. Additional wells were installed at the site as part of the pre-application site characterization, described in Chapter 2 of the EIS, some of which will be included in the expanded groundwater-monitoring network. The NRC staff will review the consequences of an accidental release of radionuclides to the groundwater in its Safety Evaluation Report.*

### D.2.10 Comments Concerning Ecology - Terrestrial

**Comment:** And about the wildlife, I hunt a lot around here. And I can tell you, from talking to the old timers, there weren't any deer around here in the '40s, there weren't any bald eagles here in the '60s and '70s, and there certainly weren't any black bears. But guess what? They are all back in Fairfield County. Black bears, yes, they are roaming around right here at night. And that nuclear plant isn't killing them. (0049-26 [Dennis, Dan])

**Comment:** SR144 [My concern(s) about the two proposed reactors is/are] loss of animals (0050-61 [Respondent, Community Survey])

**Response:** *Current wildlife data for the site, vicinity, and transmission line corridors will be summarized in Chapter 2 of the EIS, and potential impacts of plant construction and operation will be discussed in Chapters 4 and 5 of the EIS.*

**Comment:** [What impact is anticipated on these aquatic ecosystems and] what will the resulting impact [of potential oxygen level impacts to aquatic ecosystem] be on the keystone species in this environment, the Bald Eagle (*Haliaeetus leucocephalus*)? (0041-4 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** And what impact might that [drop in oxygen levels prove detrimental to those aquatic ecosystems] have on the keystone species of this environment, the bald eagle? (0049-4 [Barnes, Jenifer])

**Response:** *Discussion of impacts to aquatic and terrestrial ecology, including the bald eagle and other important species and habitats, resulting from construction and operation of the proposed Units 2 and 3 will be discussed in Chapters 4 and 5 of the EIS.*

**Comment:** Protected Species. The EIS should present a detailed analyses of potential impacts to federally protected species as a result of the construction and operation of the Summer site. Although the main facility may be located in Fairfield County, infrastructure development, mining operations, supply components and transmission utilities are an integral part of the reactor facility and must be reviewed for impacts to threatened and endangered species. The Service does have records of smooth coneflower (*Echinacea laevigata*) from near the Cherokee County project site. We recommend a field survey to determine the presence or absence of this species and its habitat. (0012-6 [Hall, Timothy N.])

**Response:** *The NRC staff will assess potential impacts to Federally-protected species stemming from construction and operation of the proposed Units 2 and 3 in Chapters 4 and 5 of the EIS. Cumulative of impacts to Federally-protected species will also be discussed in the EIS.*

**Comment:** The listed T&E species include Federal species of concern that are currently under status review by the Service and may occur in the project impact area. Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request that any surveys include these species as well. The presence or absence of these species in the project impact areas should be addressed in the environmental assessment. We encourage you to consider alternatives which minimize impacts to these species and their habitats that may be present in the area of affect of the project. (0012-7 [Hall, Timothy N.])

**Response:** *The NRC staff will describe species and habitats meeting NRC criteria for "important" in the project impact areas of the proposed site in Chapter 2 of the EIS, and will assess potential impacts to those species from construction and operation of the proposed Units 2 and 3 in Chapters 4 and 5 of the EIS. NRC "important" species include both Federally-listed and State-listed species and habitats, and any species or habitats considered to be of special concern to the relevant Federal or State agencies.*

**Comment:** Potential impact to migratory bird populations and movement should also be analyzed. We are concerned about impacts of potential bird collisions, or electrocution. We believe that a monitoring program should be developed consistent with the MOA between the Service and NRC for migratory birds. Since bald eagles, osprey, black and turkey vultures, and herons frequent the project vicinity, we recommend any associated transmission lines or distribution lines crossing wetlands, large bodies of water, or open areas should be maintained to maximize visibility of the line to raptors by one of the following design modifications: (1)

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remove the static line, (2) enlarge the static line to improve visibility to raptors, or (3) mount aviation balls or similar markers on the static line. (0012-8 [Hall, Timothy N.]

**Comment:** How will stormwater basins, settling ponds, lagoons, and other storage facilities be designed and managed to minimize impacts to migratory birds, including waterfowl? (0012-9 [Hall, Timothy N.]

**Response:** *The NRC staff will assess potential impacts to migratory birds, including waterfowl, from construction and operation of the proposed Units 2 and 3 in Chapters 4 and 5 of the EIS. Best Management Practices (BMPs) will be discussed in Chapter 5 of the EIS. Cumulative impacts will also be addressed in the EIS.*

**Comment:** High quality natural areas and hardwood forests occur along the river corridor and are home to a diversity of game and non-game wildlife species. Many nesting populations of bald eagle (*Haliaeetus leucocephalus*) inhabit its floodplain and depend on the Broad as a source of food. (0036-3 [Vejdani, Vivianne])

**Response:** *The NRC staff will describe the bald eagle and other important species and habitats, as well as any federally listed terrestrial species and habitats in potentially affected areas, in Chapter 2 of the EIS. The NRC staff will assess potential impacts to those species and habitats from construction and operation of the proposed Units 2 & 3 in Chapters 4 and 5 of the EIS.*

**Comment:** We recommend the licensee incorporate low impact procedures such as constructed wetlands, rain gardens, and double silt fencing throughout construction. Storm water detention facilities should be built well above floodplains and wetlands, and should not impound any streams. Detention facilities should discharge to constructed wetlands for further treatment of stormwater runoff. In shoreline areas, the applicant should use bioengineering techniques to the greatest extent possible. Maximum width buffers should be maintained between any construction site and any aquatic site. These buffers should be non-disturbance areas that are maintained in natural vegetation. (0036-14 [Vejdani, Vivianne])

**Response:** *The NRC staff will assess potential impacts to wetlands, floodplains, streams, and riparian habitats from construction and operation of the proposed Units 2 and 3 in Chapters 4 and 5 of the EIS, and will include discussion of associated BMPs to address stormwater runoff issues.*

**Comment:** The COL [Application, Part 3, Environmental Report] states that a small portion of a small intermittent stream and its associated wetland extend slightly into the area in which the cooling towers would be located; a portion of this wetland would be impacted by construction activities. During an interagency meeting with the licensee on February 5, 2009, anticipated impacts to intermittent stream and wetland were described as totaling approximately 600-700 linear feet and approximately 0.30 acre of wetland. We recommend avoiding all impacts to onsite streams and wetlands to the greatest practicable extent. An appropriate mitigation plan

for unavoidable impacts to waters of the United States should be reviewed and approved by resource agencies and provided consistent with the Federal Mitigation Rule. (0036-15 [Vejdani, Vivianne])

**Response:** *The NRC staff will assess impacts on onsite wetlands from construction of the proposed cooling towers, and discuss mitigation plans for unavoidable impacts in Chapter 4 of the EIS.*

**Comment:** Invasive Exotic Species. We are also concerned with the introduction and spread of invasive exotic species in association with the proposed project. Without active management, including the revegetation of disturbed areas with native species, project corridors will likely only be sources of (and corridors for) the movement of invasive exotic plant species. Exotic species are a major contributor to native species depletion and extinction, second only to habitat loss. Exotics are a factor contributing to the endangered or threatened status of more than 40 percent of the animals and plants on the Federal List of Endangered and Threatened Wildlife and Plants (Wilcove, et. al., 1998). It is estimated that at least 4,000 exotic plant species and 2,300 exotic animal species are now established in the United States, costing more than \$130 billion a year to control (Pimentel, et. al., 2000). Additionally, the U.S. Government has many programs and laws in place to combat invasive species (see [www.invasivespecies.gov](http://www.invasivespecies.gov)) and thus cannot spend money to counter these efforts. Specifically, Section 2(a)(3) of Executive Order 13112 -Invasive Species (February 3, 1999) directs federal agencies to "not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere." Despite their short-term erosion-control benefits, many exotic species used in soil stabilization seed mixes are persistent once they are established, thereby preventing the reestablishment of native vegetation. Many of these exotics plants are also aggressive invaders of nearby natural areas, where they are capable of displacing already established native species. Therefore, we strongly recommend that only native plant species be used in association with all aspects of this project, including secondary impacts (i.e., connecting sewer lines). (0012-14 [Hall, Timothy N.]

**Response:** *The NRC staff will assess potential impacts to important terrestrial species and habitats from invasive exotic species during construction and discuss any associated BMPs in Chapter 4 of the EIS.*

**Comment:** Lighting. We are concerned about the effects of night security lighting. We are primarily concerned about the potential for overlighting the large site and the potential adverse effects on fish and wildlife resources in the area, including migratory birds and bats. A dark nighttime sky is essential. Contributions of light from the earth (both direct emissions and reflected light) brighten the night sky background. This brightening also greatly diminishes the view of the sky for migrating birds, moths, bats, and the general public. The type of light source chosen for outdoor lighting is important because some types may result in more adverse effects than others. We prefer down-shielded, low-pressure sodium (LPS); its nearly monochromatic yellow light can be easily filtered out. Other advantages of LPS are that the wavelength emitted is most near the point where the human eye is most sensitive and efficient, and it is also the most energy-efficient light source available. All outdoor fixtures should be fully shielded and

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installed in such a way that no light is emitted above a horizontal plane running through the lowest part of the fixture. Thus, glare, light trespass, and light pollution will be minimized, and energy savings will be maximized. The design of the fixtures should include time controls or occupancy sensors to turn lamps off when not needed (LPS has the ability to restrike immediately after a momentary power failure, while high-pressure sodium and metal halide lamps must cool before restriking). We recommend safe, energy-efficient lighting that minimizes impacts to fish and wildlife resources. (0012-10 [Hall, Timothy N.]

**Comment:** Infrastructure. All activities associated with the construction and necessary operations of the Summer site should be considered a part of the project and considered in the EIS. Construction of transmission lines, roads and support structures may contribute to resource impacts that extend well beyond the foot print of the Summer site. Stormwater detention and retention capacities should be designed and constructed to adequately prevent contamination of adjacent land and water resources. (0012-11 [Hall, Timothy N.]

**Response:** *The NRC staff will assess potential impacts to terrestrial species onsite and in the vicinity of the proposed Units 2 and 3 from construction and operation in Chapters 4 and 5 of the EIS.*

### D.2.11 Comments Concerning Ecology - Aquatic

**Comment:** look very carefully what happen in the nuclear industry in France in the 2006 summer? Probably remind the people working and living here, that in the end of '80s, there was some kind of boiling fish in the park reservoir. What is going to happen if you are going to have two extra reactors here? We are going to boil alligators? (0011-67 [Wojcicki, Joe])

**Comment:** Water Intake, Loss and Thermal Changes. The Summer site proposes to obtain water from the Monticello Reservoir to serve as a heat sink for the reactors during power operations. Intake of water poses a potentially adverse affect upon the aquatic biota. We understand that the volume of water taken for facilities of this type from generally exceed the volume returned. Much of the water used in cooling operations will be lost through evaporation. Therefore, the EIS must analyze impacts to downstream habitats and species as a result of this water loss. We encourage you to develop an instream flow study plan that considers the potential effects of these consumptive losses across the full range of flow scenarios. How will the water abstraction impact the physical habitat of fish and other aquatic community members? We will be glad to review and participate in the development of a study to consider the potential effects on aquatic species, their habitats, and community assemblages. (0012-2 [Hall, Timothy N.]

**Comment:** Water returned to the reservoir is likely to have a substantial temperature variation from the intake water. A sudden change in the thermal environment may be hazardous to aquatic organisms near the outflow. The EIS must address these impacts and provide alternatives to eliminating or reducing aquatic thermal variations. (0012-3 [Hall, Timothy N.]

**Response:** *The NRC staff will assess the potential ecological and hydrological impacts in Monticello Reservoir and in Parr Reservoir due to the operation of the intake and discharge from the proposed Units 2 and 3 in Chapter 5 of the EIS.*

**Comment:** Impingement and Entrainment of Aquatic Organisms. One of several issues associated with a large water intake includes impingement and entrainment of aquatic organisms at the cooling water intake. Previous studies at similar nuclear sites by Duke found impingement of some fishes, mostly threadfin shad, some bluegill, and alewife, most during periods of cold water. Although these impacts may be considered small, we recommend that the licensee establish a regular monitoring program and develop a strategy to reduce impingement and entrainment, and to mitigate these potential impacts. Methods to prevent entrainment of aquatic species such as appropriate screen sizes, low pump velocities or variable operation schedules during power operations to block biotic intake must be detailed in the EIS. (0012-4 [Hall, Timothy N.]

**Response:** *Although it can recommend ecological monitoring, the NRC does not have the authority to require operational monitoring on the part of the applicant. However, the NRC staff will evaluate potential impingement and entrainment impacts due to operation of the proposed Units 2 and 3 in Chapter 5 of the EIS.*

**Comment:** Protected Species. The EIS should present a detailed analyses of potential impacts to federally protected species as a result of the construction and operation of the Summer site. Although the main facility may be located in Fairfield County, infrastructure development, mining operations, supply components and transmission utilities are an integral part of the reactor facility and must be reviewed for impacts to threatened and endangered species. Heelsplitter (0012-5 [Hall, Timothy N.]

**Response:** *The NRC staff will assess potential impacts to Federally-protected species stemming from construction and operation of the proposed Units 2 and 3 in Chapters 4 and 5 of the EIS. Cumulative impacts associated with the construction and operation of the proposed Units 2 and 3 will be evaluated in Chapter 7 of the EIS.*

**Comment:** Secondary and Cumulative Impacts. Additional reactors at the Summer site may foster or accelerate increased development of the surrounding areas.....Particular attention should be given to the effected lacustrine and natural wetland and floodplain systems. We are concerned that the water intake from the Monticello Reservoir will disrupt the ecological balance within the system. How will the water intake affect the drinking water supplies and assimilative capacity of the reservoir? (0012-13 [Hall, Timothy N.]

**Response:** *The NRC staff will assess potential ecological and water-quality impacts in the Monticello Reservoir from operation of the intake for the proposed Units 2 and 3 in Chapter 5 of the EIS.*

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**Comment:** The Broad River is an outstanding resource of state and regional significance and is important habitat for the priority conservation species robust redhorse (*Moxostoma robustum*) and American shad (*Alosa sapidissima*), a wide diversity of freshwater fish and mussel species, and economically important recreational fisheries. (0036-1 [Vejdani, Vivianne])

**Response:** *A description of aquatic biota that occurs in Parr Reservoir, and the recreational fisheries in the reservoir, will be included in Chapter 2 of the EIS. The NRC staff will assess potential construction and operation impacts to aquatic biota in Chapters 4 and 5 of the EIS.*

**Comment:** The [Broad] river also supports numerous populations of the rare and sensitive plant species rocky shoals spider lily (*Hymenocallis coronaria*). (0036-2 [Vejdani, Vivianne])

**Response:** *The NRC staff will assess impacts to rare and sensitive plant species in Chapters 4 and 5 of the EIS.*

**Comment:** DNR manages the Parr Reservoir and Monticello Reservoir Waterfowl Management Areas, and the Monticello Sub-impoundment supports a recreational fishery. Water level fluctuations within the reservoirs and their potential impact on waterfowl habitat and fisheries are of concern. Increased temperatures during low flows have caused fish kills in the Monticello Reservoir. In the early to mid-1990s the licensee employed several mitigation measures, including dredging the discharge canal in 1993, to increase water circulation and cool water temperatures during low flow periods. No fish kills have been reported since that time. It is not known what, if any, impacts may accrue from increased reservoir fluctuations attributable to the addition of Units 2 and 3. Additional consultation throughout licensing is requested to address these concerns. (0036-11 [Vejdani, Vivianne])

**Response:** *The NRC staff will evaluate the impacts to aquatic biota in the Monticello Reservoir stemming from the hydraulic fluctuation and operation of the proposed Units 2 and 3 in Chapters 5 and 7 of the EIS. NRC will continue consultation with the South Carolina Department of Natural Resources (SCDNR), per the Fish and Wildlife Coordination Act, as stated in the letter from NRC to SCDNR dated January 12, 2009.*

**Comment:** As noted in the COL [Application, Part 3, Environmental Report], DNR stocks robust redhorse and smallmouth bass in the Broad River. Smallmouth bass have developed into a spawning population and fishery of increasing local and regional significance. Robust redhorse will continue to be stocked by DNR with the goal of creating a self-sustaining population. Both species were collected in the Monticello Reservoir in 2008. It is not known whether the intake area of the Parr Reservoir and FPSF is attracting these species, and there is a concern that increased pump-back operations may have an adverse impact on smallmouth bass and robust redhorse populations. (0036-13 [Vejdani, Vivianne])

**Response:** *The NRC staff will discuss important aquatic species, including the robust redhorse and smallmouth bass, near the vicinity of the proposed site in Chapter 2 of the EIS. Chapter 5 of the EIS will include an impact analysis on such species resulting from operation of proposed*



*Units 2 and 3. Cumulative impacts, including those related to the pump-back operations of the Parr Shoals hydroelectric power facility, will be analyzed in Chapter 7 of the EIS.*

**Comment:** Inflow to the Parr reservoir has been considerably lower than the modeled 7Q10 flow. Adverse impacts to aquatic resources can be significant if organisms are not able to avoid or find refugia from the thermal plume. More information is needed on the extent of the plume under very low flow conditions (e.g., flows less than the 7Q10 of 853 cfs). DNR requests additional consultation on the analysis of thermal impacts for low-flow conditions. (0036-18 [Vejdani, Vivianne])

**Response:** *The NRC staff will analyze and assess potential impacts to aquatic biota in the Parr Reservoir stemming from thermal discharge of the proposed Units 2 and 3 in chapter 5 of the EIS. NRC will continue consultation with SCDNR, per the Fish and Wildlife Coordination Act, as stated in the NRC letter to SCDNR dated January 12, 2009.*

**Comment:** [Is the carrying capacity of Lake Monticello large enough to mitigate the cooling needs of two additional reactors?] Or will the increased water temperatures pose a significant impact on water quality resulting in a detrimental impact on the resident wildlife? (0041-2 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** How will the additional cooling needs impact oxygen levels in both the Broad River and Lake Monticello? What impact is anticipated on these aquatic ecosystems (0041-3 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** Will the impact of the continuing drought condition on the aquatic ecosystems of the Broad River and Lake Monticello be given consideration when the EIS is conducted? (0041-5 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** On the environmental front, I want to know, is the carrying capacity of Lake Monticello large enough to mitigate the cooling needs of two additional reactors? Or will the increases in water temperature lead to an unacceptable drop in water quality standards, posing a significant threat to the resident wildlife? (0049-2 [Barnes, Jenifer])

**Comment:** How will those additional cooling needs impact the oxygen levels, in both Lake Monticello and the Broad river? Would a drop in oxygen levels prove detrimental to those aquatic ecosystems? (0049-3 [Barnes, Jenifer])

**Comment:** SR53 [My concern(s) about the two proposed reactors is/are] Fish and wildlife dying. (0051-47 [Respondent, Community Survey])

**Response:** *The NRC staff will assess the potential direct and cumulative impacts to aquatic ecosystems stemming from water withdrawals from the Parr Reservoir and the Monticello Reservoir as a result of operation of the proposed Units 2 and 3. Other potential water-quality and thermal impacts on dissolved oxygen levels and aquatic biota will also be analyzed by NRC staff. These issues will be addressed in Chapters 5 and 7 of the EIS.*

## D.2.12 Comments Concerning Socioeconomics

**Comment:** I think one of the first things that we are concerned about, and we think you should be concerned about, is the economics of this plant. They have asked for a 37 percent rate hike, immediately, because they want you to start paying for this thing up front. And it is going to raise utility bills. (0011-113 [Corbett, Susan])

**Comment:** SR147 [My concern(s) about the two proposed reactors is/are]and light bills being higher than normal (0050-68 [Respondent, Community Survey])

**Response:** *The purpose of the EIS is to disclose potential environmental impacts of constructing and operating the proposed Units 2 and 3. Neither the determination of the impact of constructing and operating a nuclear power plant on retail power rates, nor the impacts such potential rate changes may cause, is under NRC's regulatory purview, and therefore these comments will not be considered further.*

**Comment:** South Carolina in particular has a chance to really benefit from a massive program of nuclear power plant construction. In Columbia, Westinghouse Nuclear makes the fuel rods. In Greenville, GE designs generation facilities. In Barnwell we can reprocess nuclear waste into reusable fuel and eliminate the waste problem. This is already being done throughout the rest of the world. Finally, Charleston can ship & receive nuclear power plant equipment and materials throughout the world. The number of high paying skilled jobs created could change the very way SC Citizens lead their lives for the better. (0001-6 [Byrd, William A.]

**Comment:** Nuclear plants are substantial contributors to the tax base, which supports the region both directly and indirectly. A significant number of Newberry County residents are currently employed at the plant. The two proposed units would only add more much needed, high paying, job opportunities for the citizens of Newberry County, and the surrounding area. (0010-17 [Powers, Theresa])

**Comment:** And the other thing about jobs, 90 percent of the people that work at the nuclear power plant, over the last 25 to 30 years, according to the community, do not live in Fairfield County, and there is some fear that if all these jobs come here, and affluent people come here, whether or not they are going to live in the county, or other different places. Again, I said, they impact the land, and take the land (0010-37 [Marcharia, Kamau])

**Comment:** At the present time we [Midlands Technical College, main workforce educator serving Fairfield, Lexington, and Richland Counties] are working with three important partners in this process. The Shell Group, who will actually construct these units, the South Carolina Electric and Gas, who will operate and maintain these units; and also the Westinghouse Company, who will supply the two AP100 units. And, importantly, for our region here in South Carolina, the Westinghouse plant in Richland County, South Carolina, which produces now, and will produce all of the nuclear fuel, the nuclear rods for those particular two plants. In that regard we are working with the house Shell Group, who will construct those companies. We are looking at more than 3,000 skilled craft

workers, required over ten years, to build those plants.

We are looking at welders, electricians, iron workers, carpenters. In addition to that, millwrights, and so on and so forth, to make that happen. We have a partnership with them now, we are working in concert with them to develop the programs, and make that happen.

With South Carolina Electric and Gas, they have asked us to develop a nuclear operator training program. And they, by sitting on our advisory committee, by giving input into the curriculum, we are now developing that nuclear operator training program, so that you have environmental and safe programs, in terms of the ability to run those facilities long term.

And we really do appreciate the working relationship that we have, and the partnership we have with South Carolina Electric & Gas, in order to develop those programs, and have the advisory council go out and recruit the people, and get the right kind of people into those particular programs.

And then, thirdly, we are presently starting to work with the Westinghouse Company. We work with them, extensively, over the years. But now we work with them even more, as they will need to ramp up to supply more of the nuclear fuel.

Here in Fairfield County, along with Mr. Ferguson, and Mr. Brown, who chair the County Council, we have been able to get a new training facility. We just got a million dollars from the State of South Carolina Department of Commerce, to build a quick jobs training center, where we will be able to provide the training, help provide some of that training in the skilled craft area. And, also, start to develop students who can take those courses to become nuclear operators. So we look forward to that particular partnership. (0010-5 [White, Sonny])

**Comment:** [...these two reactors, forget about the Duke Power reactors, somewhere in Cherokee County, this is going to take the water from about two million people, or it is going to take the water from over a quarter of million farms, the farms that are going to create the food for us.] If we are going to take the water from these people, what you can expect to pay for the tomatoes, and all this stuff, right now, even the peanuts, which is a South Carolina product. (0010-91 [Wojcicki, Joe])

**Comment:** I wanted to speak, tonight, about the economic environment. It is a little different, but it is also an environment that is very important to us. (0011-1 [Cincotta, Jill])

**Comment:** It is my understanding, as we build these two new reactors, we get two new reactors, and one is we get two for the price of one. One is going to be state, and the other one is going to be private. So I understand the state don't pay taxes, so the community will only be getting taxes for one of these reactors, is my understanding, that Santee Cooper versus SCE&G (0011-22 [Marcharia, Kamau])

**Comment:** If you are planning of bringing thousands of people here, that would equate to more people that is living in the town of Winnsboro, and they have only four to five thousand, we would be close to ten thousand people in this district working, if we can get those jobs. (0011-29 [Marcharia, Kamau])

**Comment:** A significant number of our [SCE&G] security contract staff are local, which provides jobs for the local community. (0011-37 [Archie, Jeff])

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**Comment:** Finally, as has been mentioned, in an era of economic uncertainty, the building of these plants will bring both construction jobs, and long-term operational jobs to this area. (0011-48 [Rudnicki, Steve])

**Comment:** We've got people coming from everywhere, we live here, we need growth, we need somewhere for people to work, whether you live here, or whether you live in Blair, or whether you live at Ridgetech, or Jenkinsville, or Winnsboro, it doesn't matter, if you live in Georgia it doesn't matter. The place needs growth. And that is what we are looking for tonight. (0011-80 [Rabb, Ernestine])

**Comment:** We talk about the pros, you talk about the pros, and you want everybody to say yes, we want to put these here, we want to bring jobs. But do you think about the costs? If you are going to think about putting jobs here, or the nuclear plant here, is it just going to be to the people that live in this community, are you going to open up jobs to this community first, or are you going to extend the boundaries outside the community and bring in 10,000 people from 150 miles away, when the people here are the ones that need the jobs. (0011-86 [Hill, Carol])

**Comment:** As you know, the construction and operation of the plants will greatly benefit the economy of South Carolina. As members of the business community, truck owners and operators will greatly benefit from the economic development created by the project. (0014-1 [Todd, J. Richards])

**Comment:** Moreover, the construction and operation of the plants will generate thousands of construction jobs, more than a hundred direct new permanent jobs and the positive collateral benefits as well. (0017-6 [Campbell, Paul G., Jr.] [Duncan, Jeff] [Harrison, James H.] [Laffitte, Sterling] [Lummus, John] [Ott, Harry L., Jr.] [Pinson, Lewis E.] [Rawl, Otis B.] [Sandifer, Bill] [Smith, J. Roland] [Sottile, Mike] [Thordahl, Jeff])

**Comment:** We look forward to the stimulus of new houses being built, increased sales of new and existing homes, new small businesses that will spin-off and the tremendous increase in tax base for the county and the state. The homeowners and businesses will be greatly benefited by dependable, low-cost electricity. (0017-7 [Campbell, Paul G., Jr.] [Duncan, Jeff] [Harrison, James H.] [Laffitte, Sterling] [Lummus, John] [Ott, Harry L., Jr.] [Pinson, Lewis E.] [Rawl, Otis B.] [Sandifer, Bill] [Smith, J. Roland] [Sottile, Mike] [Thordahl, Jeff])

**Comment:** Moreover, the construction and operation of the plants will generate thousands of Construction jobs and nearly 1000 permanent jobs in an area where unemployment is rampant. Further, we look forward to the stimulus of new houses being built, increased sales of new and existing homes, new small businesses that will spin off and the tremendous growth in the tax base for both Fairfield County and the state of South Carolina. The homeowners and businesses across our region will benefit significantly from this dependable, low-cost electricity. (0021-6 [Lanier, Hope])

**Comment:** As a small business owner, I recognize the need for low cost energy sources and benefits to the tax base of additional power-producing facilities. (0030-1 [Combie, Joan])

**Comment:** Also, in respect to South Carolina's economic future, we will benefit with the creation of jobs and the further development of our state's competitiveness. (0031-3 [Beaman, Charles, Jr.] [Benjamin, Steve] [McLeese, Ike] [Novinger, Cathy] [Speth, Charles Ted])

**Comment:** The Home Builders Association is continually working to increase homeownership in South Carolina through housing construction in an environmentally sensitive manner and we believe SCANA and Santee Cooper's record of running the VC Summer Plant will ensure that the American dream of home ownership will be realized. The plant will generate thousands of construction jobs and a couple hundred direct new permanent jobs which will spur the building of new homes, businesses and a large increase in tax base for the county and state. Homeowners and businesses in South Carolina will greatly benefit from the construction of dependable, low-cost electricity. (0032-3 [Gregorie, Jim])

**Comment:** Economically, property taxes totaling more than \$19 million are paid annually for the site itself and more than 800 are employed at and live in close proximity to V.C. Summer. These are dollars, jobs and residents to the area that benefit schools, roads and other local infrastructure. Approximately 3,000 to 4,000 people will be employed for three to four years during construction of the two new units, while another 800 to 1,000 full-time workers will be hired to operate the new reactors. With a 12% unemployment rate; 18% of Fairfield residents living at or below the poverty level; and a median household income of \$8000 less than the state average, the existing and future jobs associated with V.C. Summer are vital to this county's growth and prosperity. (0033-12 [Merrill, Denver])

**Comment:** Specifically to the impact of the expansion of the V.C. Summer Nuclear Station, it's not only environmentally safe, but Fairfield County will see a substantial economic benefit. (0033-9 [Merrill, Denver])

**Comment:** Moreover, the construction and operation of the plants will generate thousands of construction jobs, a couple hundred direct new permanent jobs and the positive collateral benefits as well. (0046-6 [Hendrix, Samuel H.] [Hope, Leslie B.]

**Comment:** Construction and operation of the plants will generate thousands of jobs in the Fairfield County area. The development of the nuclear reactors will stimulate the economy by increasing the number of new homes built, increasing sales on existing homes, and creating new businesses. An added benefit is the increase in tax base for the county and the state. (0047-4 [Whatley, Michael])

**Comment:** I'm well aware that V.C. Summer provides the single largest source of revenue for Fairfield County. However, it is my belief that the short-term financial benefits of this project are far outweighed by the potential for long-term harm. Let us take off our blinders, see the whole picture, and not be blinded by the promise of economic gain. Thank you. (0049-11 [Barnes, Jenifer])

**Comment:** And not only will units 2 and 3 provide more jobs, some 3 or 4,000 during the construction phase, an additional 6 to 800 permanent employees. By the way, the leadership at

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SCANA has been very involved with engaging the local technical colleges, the universities, local workforce partners, in developing programs to begin preparing the workforce in this area, to both be eligible for these construction jobs, as well as for the permanent operator positions.

(0049-14 [Harrison, Tiffany])

**Comment:** In addition we will be looking at more tax revenue as a result of these two proposed reactors. (0049-15 [Harrison, Tiffany])

**Comment:** I'm a business owner, I own a small engineering company, surveying and construction management. We employ 80 people. Ten of our employees live in Fairfield County. We happen to be the county engineers for Fairfield County, our firm. We do a lot of work in the county. Obviously we also do some work for the town of Winnsboro, and the town of Ridgeway. We have an office located in downtown Winnsboro, 118 S. Congress Street. Why am I telling you all this? I have skin in the deal, just like you folks do. And let me tell you, I will get into a little bit more of that skin in the deal. (0049-18 [Dennis, Dan])

**Comment:** I am in favor of this project. And I'm going to tell you why. This project is good for Fairfield County. Fairfield County is rural, and it is poor, and it needs these plants. (0049-19 [Dennis, Dan])

**Comment:** But I want to leave with this message. And you NRC folks, I don't see anybody writing anything down, so write this down. SCE&G, SCANA and Santee Cooper have to do a better job of spending the 11 billion dollars that it will ultimately take to build these two plants. What do I mean by that? They are sole-sourcing this project to one contractor. Let me repeat myself. One contractor has one contract for 10 to 11 billion dollars. Okay, that is fine. That contractor may or may not sub that work out to small businesses in Jenkinsville, in Columbia, in South Carolina, because their contract doesn't require them to do that.

This project is the largest project in the history of South Carolina. There is no other project as big as this. SCE&G just finished building the backup dam for Lake Murray. This project would make that look like building a picnic table.

SCE&G has to assure us that small businesses have the opportunity to bid on work. Nobody should get a handout, but we should have the opportunity to bid on work. It should not be given to one company, and that money go out of state. I don't know what percent of 11 billion dollars, or 10 billion dollars should stay in South Carolina, but one percent of one billion dollars is a hell of a lot of money. And it needs to stay in Jenkinsville, it needs to stay in Columbia, and it needs to stay in South Carolina. And the only way to do that is through small business. Small business is the economic backbone of this country, 90 percent of the jobs in America are created by small business.

So SCE&G you have to fix that. I'm not going to let up. I have talked to the highest gentleman at SCANA, I have talked to the highest folks at Santee Cooper, I will not give up. You must convince your contractor, who is building these plants, as we speak --to outsource this work to small businesses. You guys are writing this down? This needs to be in the NEPA document. And it needs to be in the EIS, because I'm going to read the EIS, and I'm going to check it, and this falls under the socioeconomic section. Small business jobs need to be created, but they need to be created by small businesses. Thank you. (0049-27 [Dennis, Dan])

**Comment:** And the interest that I want to convey to you is that when I went to work at a Duke facility in Catawba, and at a Duke facility at McGuire in Charlotte, and at a Duke facility at Oconee up there in Seneca, Seneca has three reactors, the others had two. But what I saw was the magnitude of people, and the jobs that were available. And that being said, this county needs something like that, where we can get jobs. But at the same time the safety aspect of it, which I'm glad that you all will truly address, that it is viable to do that. (0049-36 [Hendrix, Clifton])

**Comment:** But myself, if I wanted to, I could work year round making a pretty good bit of money just working the shutdowns that occurs. And right now this facility has one every 18 months, I believe. And with three that means that they will have an average of two a year. And for people that want seasonal work, that is good. But the main thing is that real jobs, the one that they talked about, the 800 now, and the 600 that might come about, that is a real plus for this county, if we train ourselves for it. And the systems that they have in place that provide the training. (0049-37 [Hendrix, Clifton])

**Comment:** SR96 [My concern(s) about the two proposed reactors is/are] Jobs (0050-17 [Respondent, Community Survey])

**Comment:** SR97 [My concern(s) about the two proposed reactors is/are] Jobs, (0050-19 [Respondent, Community Survey])

**Comment:** SR101 I agree with it because it will allow more jobs and will benefit the economy. (0050-22 [Respondent, Community Survey])

**Comment:** SR81 [My concern(s) about the two proposed reactors is/are]high taxes (0050-3 [Respondent, Community Survey])

**Comment:** SR109 I don't have any concerns. It is a great opportunity to bring more jobs to the area. (0050-33 [Respondent, Community Survey])

**Comment:** SR114 [My concern(s) about the two proposed reactors is/are]higher taxes (0050-34 [Respondent, Community Survey])

**Comment:** SR114 [My concern(s) about the two proposed reactors is/are]jobs being given to outsiders like before (0050-36 [Respondent, Community Survey])

**Comment:** SR114 Yes, people in Dawkins, Jenkinsville, Blair should have first choice [to be offered jobs at VCSNS]. (0050-37 [Respondent, Community Survey])

**Comment:** SR126 Yes it's a good thing because it would provide jobs to those that don't have jobs. (0050-43 [Respondent, Community Survey])

**Comment:** SR127 [My concern(s) about the two proposed reactors is/are] That they be safe and provide jobs for Fairfield County. (0050-44 [Respondent, Community Survey])

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**Comment:** SR132 [My concern(s) about the two proposed reactors is/are] Losing land due to taxes (0050-49 [Respondent, Community Survey])

**Comment:** SR133 [My concern(s) about the two proposed reactors is/are] High taxes (0050-51 [Respondent, Community Survey])

**Comment:** SR138 [My concern(s) about the two proposed reactors is/are]Growth for the county (0050-52 [Respondent, Community Survey])

**Comment:** SR140 We need more jobs. (0050-56 [Respondent, Community Survey])

**Comment:** SR141 We need more jobs. (0050-57 [Respondent, Community Survey])

**Comment:** SR145 [My concern(s) about the two proposed reactors is/are]3 Job placement (0050-64 [Respondent, Community Survey])

**Comment:** SR146 [My concern(s) about the two proposed reactors is/are] 1 Jobs 2. Community development. (0050-65 [Respondent, Community Survey])

**Comment:** SR147 [My concern(s) about the two proposed reactors is/are]taxes on the land going up (0050-67 [Respondent, Community Survey])

**Comment:** SR152 I have no concerns. Fairfield County need jobs. (0050-71 [Respondent, Community Survey])

**Comment:**

SR160 I don't have any [concerns about the two proposed reactors}, I think it is a great opportunity to bring jobs back in Fairfield County. (0050-73 [Respondent, Community Survey])

**Comment:** SR161 [The two proposed reactors] Will be a great opportunity for new jobs in Fairfield County. (0050-74 [Respondent, Community Survey])

**Comment:** SR87 We need these jobs [at VCSNS for Fairfield County residents] to boost the economy in this area. (0050-8 [Respondent, Community Survey])

**Comment:** SR169 I have no concerns as long as it [two proposed reactors] provides jobs here in Fairfield Co.. (0050-81 [Respondent, Community Survey])

**Comment:** SR171 [My concern(s) about the two proposed reactors is/are]Bringing jobs to the people (0050-82 [Respondent, Community Survey])

**Comment:** SR171 Looking towards retirement, my husband and I more concerned about the young people jobs.. (0050-83 [Respondent, Community Survey])



**Comment:** SR8 Residents who live in fairfield county should be offered jobs first and training should be provided (0051-12 [Respondent, Community Survey])

**Comment:** SR18 Fairfield County would certainly profit from having the proposed reactors become a reality especially since there are so many people out of work. (0051-24 [Respondent, Community Survey])

**Comment:** SR54 I think that it's a good thing to provide jobs to people that don't have one or get that done lost there jobs. (0051-48 [Reed, Cyrus])

**Comment:** SR55 [My concern(s) about the two proposed reactors is/are] That there will still not be enough jobs for those who lost theres due to plants closing down, lay offs, and jobs moving. (0051-49 [Respondent, Community Survey])

**Comment:** SR3 [The two proposed reactors] might be good for community-create jobs. Do have concerns, however. (0051-5 [Respondent, Community Survey])

**Comment:** SR56 [My concern(s) about the two proposed reactors is/are] High taxes. (0051-50 [Respondent, Community Survey])

**Comment:** SR65 [My concern(s) about the two proposed reactors is/are] Will the two nuclear reactors help the residents in this area of Fairfield County or will this plant benefit people from other places. Cost of living increase? (0051-57 [Respondent, Community Survey])

**Comment:** SR67 [My concern(s) about the two proposed reactors is/are] Not able to get jobs. (0051-60 [Respondent, Community Survey])

**Comment:** SR78 [My concern(s) about the two proposed reactors is/are] High taxes, danger, lose family land because of high taxes. (0051-73 [Respondent, Community Survey])

**Response:** *Hiring choices for construction and operations labor force personnel is outside the scope of NRC's regulatory authority. The EIS, however, will evaluate the expected economic impacts of construction and operations activities including any local purchasing of production inputs, local and in-migrating labor, local spending of earnings, and tax revenues generated by local purchasing activities or from real property assessments in Chapters 4 and 5 of the EIS.*

**Comment:** I want to applaud the Chairman for coming in and expressing his desire to help Fairfield County. He talked about the construction jobs, but my prayer is that our county will not only do that, but in the sector of operating the plant, provide courses where our people can study, even if not during the daytime, at night, to advance themselves. (0010-163 [Hendrix, Clifton])

**Comment:** I have had meetings in Western Fairfield, and Shelton, Stone, Buckhead, Blair, Monticello, the Dawkins community, Jenkinsville, Austin, Herb Glenn, Bethel, and the

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Greenbriar communities, talked to people coming in and out of the stores. And I'm reflecting on the perceptions of what people have said to me. They talked about the infrastructure of roads, water system, jobs, health care, fire protection, and recreation. (0010-28 [Marcharia, Kamau])

**Comment:** For instance, with health care, putting two more reactors there, with four to six thousand people, that number keeps fluctuating, in a community that don't even have a car wash or a laundromat, of four thousand people working, perhaps, for four, five, seven years, to build this institution, or reactors, gives some concerns about health. (0010-29 [Marcharia, Kamau])

**Comment:** We have our elementary school within five to six miles of the nuclear power plant, about 300 elementary children who are all on fixed lunches, which means that their mother and father are extremely poor. And we don't know the health conditions of all those children. We know there is millions of people that don't have health care. And having the health care center that is very important for that particular part of the community, and the community wants some assistance on that. (0010-30 [Marcharia, Kamau])

**Comment:** In terms of fire stations, you are going to put two more reactors there. The community kind of felt that they needed more protection. The fire station they have is really run down, it needs some upgrading. (0010-31 [Marcharia, Kamau])

**Comment:** In the event that something happens, fire protection and health care is important. And if you have thousands, and thousands, and thousands of people coming into the community, an influx into the community, the community has a concern that folks are still buying up land, and purchasing land already in the Dawkins community. (0010-33 [Marcharia, ])

**Comment:** But if we are going to train people in Fairfield County, how do you prepare them, what are they looking for? Do they need GEDs, what is the process? People really need to know that. (0010-38 [Marcharia, Kamau])

**Comment:** So, overall, I hope that the socioeconomics...portion of the impact statement team really, really takes a look at some of the issues for such a community. (0010-60 [Tansey, Sara])

**Comment:** And those [human environmental impacts] are also economic. So you have jobs, and the promise of investment, etcetera, but you also have increased health care. You know, people losing work days because they are sick. All of these things need to be more holistic and universal. (0011-17 [Ramsburgh, John])

**Comment:** So my concern, as I have talked to the constituency in Shelton, Stone, Buckhead, Blair, Dalkans [Dawkins?] Community, Monticello, Jenkinsville, Austin, Wallaceville, Bethel, Cedar Creek, Greenbriar, I have talked to people in all of these communities. And if you are going to be here, they talked about infrastructure, roads, water systems, jobs, health care, fire protection, recreation, and displacement. (0011-25 [Marcharia, Kamau])

**Comment:** And I will say if there are going to be that many, four to six thousand people coming here to work, in this community, and we need to see the plan for what is your construction for the roads, infrastructure. Because right now people are coming from Powell and Prosperity, hit 215, residents on that road take 15 to 20 minutes to get out of their driveway, and sometimes you have school buses coming, they won't even get to school. So we want to know what kind of construction it is going to provide. (0011-26 [Marcharia, Kamau])

**Comment:** Water systems, we have some communities, in some communities we don't have drinking water, provided drinking water in some of the communities. We don't have the capacity for the water lines to provide for these communities. If you go down in the Dalkans [Dawkins?] Community, you have several hundred families down in that area, that would need fire protection, have fire hydrants in. (0011-27 [Marcharia, Kamau])

**Comment:** We have a fire station in Jenkinsville, and over the years we have had fire trucks show up at fires without any water in it. Don't ask me why that happens, but it has happened. We have had fire trucks break down, we had to give them a jump to get to the fire. And if you are going to put two more reactors, that triples the potential dangers. You can't tell me that you will never have an accident. As I have said before, the folks who work there, try to work to really keep that place safe, and I know this for a fact. But that does not obviate the fact that an accident can happen. That we need an adequate fire station, with fire trucks, in this community, an adequate water system. (0011-30 [Marcharia, Kamau])

**Comment:** We also need health care. We have four, five, six thousand people working in this community, we need health care centers in this community that are adequate to the needs of the community, in the event that some issues would occur. Several years ago SCE&G was generous enough to give this community, I think, 8.5 acres of land, and I think the express purpose of that, at that time, was to try to build a health center, and a recreation center on that, and I hope that we can follow up to be able to do that. (0011-31 [Marcharia, Kamau])

**Comment:** Now, the partnership between the Fairfield County School District, and SCE&G, will continue to grow with the growth of the new facilities at the nuclear plant. Student training for work career path at the facilities have begun. A grant has recently been written to help women start non-traditional careers, in the engineering field, to help get our county's workforce ready. This plant expansion offers the promise of job creation for our current and future students which will, in turn, increase the quality of life for residents in Fairfield County. (0011-4 [Cincotta, Jill])

**Comment:** I can sit here and say there is going to be a bunch of traffic, and there is going to be a bunch of people coming in, and what is the crime going to be, what is the crime level going to be in our little quiet neighborhood, once all of this starts to happen? (0011-6 [Ginyard, Gregrey])

**Comment:** And in the best case situation, which most people want to know, where is the employment, where is the infrastructure, where is the coming, where is the tax base, where is that? Someone needs to put that out in an informative way, so that we can all benefit from it. (0011-89 [Schaffer, Jeff])

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**Comment:** Building the nuclear plants near poor communities actually can provide job opportunities for those in that area. They can be put in training programs. This would result in less poor communities and more prosperous economies. These job skills can be applied in many other career fields: the attention to detail, managing under stress, decision making, etc. (0026-3 [Sims, Raymond])

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: Clarification regarding local job training of local workers for plant construction. (0035-5 [Zia, Barbara])

**Comment:** Finally, simply the act of construction of the two additional reactors will have a detrimental impact on the lives of the local citizens. The increase in traffic alone is something to be concerned about, particularly for the many elderly people who attempt to drive on the local roads and the children who play alongside them. Has any thought been given to decreasing the speed limits on Highways 213 and 215 within a five mile radius of the Station in order to alleviate the pressures of having so many additional heavy trucks speeding past our homes on roads which are already in great need of repair? (0041-22 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** Does Fairfield County have the infrastructure necessary for the tripling in size of this facility? The Fairfield County Fire Department is an all volunteer system with Jenkinsville having only FOUR actual members. (0041-9 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** The local environment situation analysis should show any limits for the future economical development around the reactor site (radius of 50 miles) (0044-17 [Wojcicki, Joe])

**Comment:** The South Carolina state must be prepared to educate the new reactors' construction crew as well as their operators. The present SC educational system is not ready and seems not to have a proper orientation in the field of preparation of professional and technical staff to run this kind of investment and new AP1000 generation of facilities. The report must also set minimum and required levels of education, e.g. associate (AS) degree in nuclear technology, AS in Instrumentation and Process Control from institution with ABET accreditation. (0044-22 [Wojcicki, Joe])

**Comment:** The local communities in Fairfield County are in great need of a potable water plant and a sewer plant and lines. Only with this infrastructure can the nearby communities grow and prosper. The smart residents leave because there is no opportunity in the area. The existing Plant, as you can see, has not helped with economic development in the area and few people want to live near a nuclear plant. (0048-5 [Lewis, Crosby])

**Comment:** these two reactors will also assist the state with attaining a very critical economic development goal, which is access to safe, reliable, and cost-effective power. That is a key component to the future economic development success of this county, the central Midlands region, and the state of South Carolina. (0049-16 [Harrison, Tiffany])

**Comment:** SR80 [My concern(s) about the two proposed reactors is/are] High crime. (0050-1 [Respondent, Community Survey])

**Comment:** SR89 [My concern(s) about the two proposed reactors is/are] [I] Need a better unstand [understanding?] about the plant and how in with impact in county not just Jenkinsville area. (0050-10 [Respondent, Community Survey])

**Comment:** SR94 [My concern(s) about the two proposed reactors is/are] Will it effect that community in anyways. (0050-15 [Respondent, Community Survey])

**Comment:** SR95 [My concern(s) about the two proposed reactors is/are] will they in anyway effect the residents of that community. (0050-16 [Respondent, Community Survey])

**Comment:** SR108 [My concern(s) about the two proposed reactors is/are] Will it effect our community. (0050-32 [Respondent, Community Survey])

**Comment:** SR115 [My concern(s) about the two proposed reactors is/are] Crime , traffic , loss of land , higher taxes. (0050-38 [Respondent, Community Survey])

**Comment:** SR116 [My concern(s) about the two proposed reactors is/are] Crime , traffic. (0050-39 [Respondent, Community Survey])

**Comment:** SR131 [My concern(s) about the two proposed reactors is/are] High crime , land lost. (0050-48 [Respondent, Community Survey])

**Comment:** SR145 [My concern(s) about the two proposed reactors is/are]1. Community development (0050-62 [Respondent, Community Survey])

**Comment:** SR162 [My concern(s) about the two proposed reactors is/are] Traffic (0050-75 [Respondent, Community Survey])

**Comment:** SR166 [My concern(s) about the two proposed reactors is/are] More traffic and the crime rate will go up. and the crime rate will go up. (0050-79 [Respondent, Community Survey])

**Comment:** SR167 [My concern(s) about the two proposed reactors is/are] Way over too many people in this small town of Jenkinsville. (0050-80 [Respondent, Community Survey])

**Comment:** SR20 [My concern(s) about the two proposed reactors is/are] Safety and Growth. (0051-26 [Respondent, Community Survey])

**Comment:** SR44 [My concern(s) about the two proposed reactors is/are] Traffic. (0051-36 [Respondent, Community Survey])

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**Comment:** SR47 [My concern(s) about the two proposed reactors is/are] More people, traffic. (0051-40 [Respondent, Community Survey])

**Comment:** SR52 [My concern(s) about the two proposed reactors is/are] Traffic. (0051-46 [Respondent, Community Survey])

**Comment:** SR63 [My concern(s) about the two proposed reactors is/are] 1. Health risks 2. Jobs that will be available to local citizens. (0051-55 [Respondent, Community Survey])

**Comment:** SR64 I have plenty concerns especially about crime, health care, and all of the outsiders who will be coming from different states for the jobs when there are 1,000's of people right here who need jobs. (0051-56 [Respondent, Community Survey])

**Comment:** SR68 [My concern(s) about the two proposed reactors is/are] Lost communities, traffic. (0051-61 [Respondent, Community Survey])

**Comment:** SR69 [My concern(s) about the two proposed reactors is/are all the different sickness, like cancer, babies being born deformed]....and no health facilities to take care of these things. (0051-63 [Respondent, Community Survey])

**Comment:** SR70 [My concern(s) about the two proposed reactors is/are] Younger generation carrying babies, crime. (0051-64 [Respondent, Community Survey])

**Comment:** SR71 [My concern(s) about the two proposed reactors is/are] over crowding and heavy traffic. (0051-65 [Respondent, Community Survey])

**Comment:** SR74 [My concern(s) about the two proposed reactors is/are] Communities lost. (0051-69 [Respondent, Community Survey])

**Comment:** SR75 [My concern(s) about the two proposed reactors is/are] lose land, crime. (0051-70 [Respondent, Community Survey])

**Comment:** SR76 [My concern(s) about the two proposed reactors is/are] Population increases, crime increase. (0051-71 [Respondent, Community Survey])

**Comment:** SR187 [My concern(s) about the two proposed reactors is/are]What purpose is it serving our community. (0052-20 [Respondent, Community Survey])

**Response:** *Impacts of plant construction and operation on the use of existing local infrastructure, including transportation networks, emergency services, and other community services or the need for such new infrastructure, are within the scope of the socioeconomic impacts and will be addressed in Chapters 4 and 5 of the EIS.*

**Comment:** Light and noise pollution are two other issues of concern for those of us who live near the facility (0041-20 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** Simply the act of construction of the two reactors poses a significant safety concern for those of us who live in this area. The increase in traffic, alone, is not something to be dismissed. Has there been any thought given to decreasing the speed limits on highways 213 and 215, in order to alleviate the pressures of having so many trucks speeding past our houses, on roads which are in such need of repair? (0049-9 [Barnes, Jenifer])

**Comment:** SR102 [My concern(s) about the two proposed reactors is/are] Increased problem. increased in traffic (0050-27 [Respondent, Community Survey])

**Response:** *The EIS will evaluate the physical impacts of the construction and operation of the proposed Units 2 and 3 such as visual impacts, air quality, noise, and traffic congestion in Chapters 4 and 5 of the EIS. Measures to mitigate the physical impacts, including impacts from traffic, will also be discussed in Chapters 4 and 5 of the EIS.*

**Comment:** Secondary and Cumulative Impacts. Additional reactors at the Summer site may foster or accelerate increased development of the surrounding areas. The EIS should model potential changes including, but not limited to, demographics, population growth, traffic needs, and spread of invasive and exotic species. (0012-12 [Hall, Timothy N.])

**Response:** *Impacts of plant construction and operation on the use of existing local infrastructure, including transportation networks, emergency services, and other community services or the need for such new infrastructure, are within the scope of the socioeconomic impacts and will be addressed in Chapters 4 and 5 of the EIS. The EIS also will address the effects of the action on the spread of invasive and exotic species as potential terrestrial ecology impacts.*

**Comment:** County taxes are one way the local community can offset the additional risks imposed by the location of the plants, but is there no other way that the SC Public Service Authority could be encouraged to carry some of the local burden, in nuclear safety risks, costs incurred by local city and county governments and economic deprivation? (0048-4 [Lewis, Crosby])

**Comment:** Now, I don't want to be called a hypocrite. I'm also here because the Dennis Corporation, we want to get some work out of this plant, and I'm going to get to that in a minute when I mention Mr. Steve Byrne, over there, I'm not going to let him off the hook. (0049-24 [Dennis, Dan])

**Response:** *These comments provide no information relevant to the environmental review of the COL application and therefore will not be considered further.*

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**Comment:** We realize that the Virgil C. Summer Nuclear Station is the single largest provider of tax income to Fairfield County and, therefore, our leaders are clamoring to get this permit approved. We, as concerned citizens, wish to represent those of us in the Jenkinsville area who have so often been overlooked. It is the local citizens of this area who must live with the direct impact of the current facility as well as any future impacts that expanding this facility will have. Please take our concerns seriously and consider our questions when deciding the scope and extent of the Environmental Impact Statement as well as the permit itself. (0041-23 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** SR144 [My concern(s) about the two proposed reactors is/are] increases in taxes, lost of community (0050-60 [Respondent, Community Survey])

**Comment:** SR164 [My concern(s) about the two proposed reactors is/are] Taxes will go up on the land and on the houses and the lights. (0050-77 [Respondent, Community Survey])

**Comment:** SR45 [My concern(s) about the two proposed reactors is/are] Higher Bills, lost [loss] of land. (0051-38 [Respondent, Community Survey])

**Comment:** SR46 My main concern are the elderly, disabled, and low income who get these small monthly checks not being able to afford to keep their homes, land, electricity because of the high increase of electricity bill and taxes. (0051-39 [Respondent, Community Survey])

**Comment:** SR49 [My concern(s) about the two proposed reactors is/are] Having to move from my land. (0051-43 [Respondent, Community Survey])

**Comment:** SR72 [My concern(s) about the two proposed reactors is/are] tax increase, bill increase for electricity (0051-66 [Respondent, Community Survey])

**Comment:** SR77 [My concern(s) about the two proposed reactors is/are] High taxes, land will be lost. (0051-72 [Respondent, Community Survey])

**Response:** *The potential tax-revenue impacts, along with a characterization of the current tax structure in the vicinity and region, will be addressed in the EIS. The purpose of the EIS is to disclose potential environmental impacts of constructing and operating the proposed Units 2 and 3. Neither the determination of the impact of constructing and operating a nuclear power plant on retail power rates, nor the impacts such potential rate changes may cause, is under NRC's regulatory purview, and therefore these comments will not be considered further.*

**Comment:** Number one, utility rates will rise dramatically with the building of these very expensive plants. SCE&G has refused to conduct a valid analysis of lower cost efficiency, and conservation alternatives, that could result in lower rates. (0010-114 [Cooper, Elaine])



**Comment:** SCE&G will begin charging ratepayers a decade before the plant goes on-line, with no guarantee it will actually be built, and with no refunds if they change their minds. (0010-117 [Cooper, Elaine])

**Comment:** So the shareholders are protected from that risk, but the public is holding that risk. A Public Service Commission friendly to SCE&G reduces the risk to investors about the cost, I mean, the rates that they can charge to cover their increasing costs. So ratepayers are the ones holding those risks. Even if the plant never opens, because of whatever, the lack of water, or the public opposition, or for whatever reason, rate payers will still pay, and investors are protected from that risk. (0010-169 [Rudolph, Gerald])

**Comment:** Other financial risks that SCE&G is that when rates go up alternative energies become more viable. Recently in our house we installed hot water solar heaters. And as rates go up other people will start buying more alternative energies and conserving in their homes. So the revenue that I was giving will have to be covered by the rest of you ratepayers, as the rates go up, to cover the cost of a reduced consumption. But the investors and the shareholders are protected from that. It is the ratepayers that will assume that risk. (0010-170 [Rudolph, Gerald])

**Comment:** Another are the rates. Again, there, we are hearing one thing from the utilities with respect to rates. But if you look at even Wall Street conservative, pro-business investment firms, they are projecting rates for nuclear energy that are twice what Santee Cooper and SCE&G are suggesting. (0011-19 [Ramsburgh, John])

**Comment:** And I understand that they asked for an increase from the citizens to help pay for this, prior to us ever getting service, x number of years. And that people pay into this, and happen to pass away five or six years down the road, do their family get reimbursed for all the money they put in for services they are not going to get? (0011-23 [Marcharia, Kamau])

**Comment:** And we can expect, those of us ratepayers, are going to get stuck far before the reactors operate, with potentially large cost overruns. But once reactors start up, they may have been built in China by then, but there will be no operating experience. (0011-74 [Clements, Tom])

**Response:** *The purpose of the EIS is to disclose potential environmental impacts of constructing and operating of the proposed Units 2 and 3. Neither the determination of the impact of constructing and operating a nuclear power plant on retail power rates, nor the impacts such potential rate changes may cause, is under NRC's regulatory purview, and therefore these comments will not be considered further.*

**Comment:** The other one is recreation. A lot of people don't like to talk about that. But that is important, especially over in our area. A lot of the people with resources can access recreation real easy. But from the general public standpoint, there ought to be something there that we can do better. (0010-167 [Hendrix, Clifton])

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**Response:** *Impacts of proposed Units 2 and 3 on affected public infrastructure including roads, bridges, and recreational facilities such as parks, boat ramps, and public lands will be analyzed in Chapters 4, 5, and 7 of the EIS.*

### D.2.13 Comments Concerning Historic and Cultural Resources

**Comment:** My name is Crosby Lewis, I live about five miles from the plant. My great, great, great-grandfather is buried on the site of the plant. I tell you that so that you know that I don't have any interest in this, other than myself and my family. I don't represent anybody in this proceeding. (0049-28 [Lewis, Crosby])

**Response:** *Locations of known cemeteries will be discussed in Chapter 2 of the EIS. Details on how construction and operation activities will avoid impacting known cemeteries will be described in Chapters 4 and 5 of the EIS.*

### D.2.14 Comments Concerning Environmental Justice

**Comment:** I'd like for you to really, really look at the economics. I know that SCE&G has gone before the Public Service Commission and has asked for a 37 percent rate hike immediately, to begin paying for that. And there are lots of folks, in low economic situations in this county, and in this service area, that are really going to have a hard time when their utility rates go up. (0010-64 [Corbett, Susan])

**Comment:** I think you have to look at the economics of this, and how it is going to impact people of low income, in terms of their utility bills. (0010-66 [Corbett, Susan])

**Comment:** we [Sierra Club] think this [37% rate hike] is going to be an economic hardship on low income people. We think that rising utility rates are really going to make people have to choose between keeping their lights on, and feeding your kids. (0011-114 [Corbett, Susan])

**Response:** *The purpose of the EIS is to disclose potential environmental impacts of constructing and operating the proposed Units 2 and 3. Neither the determination of the impact of constructing and operating a nuclear power plant on retail power rates, nor the impacts such potential rate changes may cause, is under NRC's regulatory purview, and therefore these comments will not be considered further.*

**Comment:** They have proposed virtually all of them in the South. I guess they figure we are more vulnerable and expendable. (0010-152 [Mason, Corry])

**Comment:** And it is just that some people are making some bucks off this thing. They know we are vulnerable, they know they can run over people in South Carolina, we are poor. (0010-156 [Mason, Corry])

**Comment:** People are building 500,000 dollars to a million dollar homes, and predominantly in an African-American community. And you put a million dollar home next to a 50,000 dollar trailer, it won't be long before you legally lose your home and land, and get run off the land.

(0010-34 [Marcharia, Kamau])

**Comment:** I have seen some studies on the impact on fish, wildlife, and fauna, and the area was more particular about that than they are particular about the people who might need some of these resources. (0010-36 [Marcharia, Kamau])

**Comment:** So, overall, I hope that the ..environmental justice portion of the impact statement team really, really takes a look at some of the issues for such a community. (0010-61 [Tansey, Sara])

**Comment:** So one of the things that I have here today, that we are going to have a lot of jobs. Now, think about what kind of jobs we can expect here. There will be, probably, jobs delivered by Westinghouse. So according to the information from the Westinghouse, there is going to be three years of the job down in the site, that is going to be -- that one of the reactor is going to build.

And if you know that Westinghouse is property of the Toshiba, what do you think that the owners of this company is going to suggest to do with these people here? Second, what kind of jobs we can expect here. Already we have heard the existing unit number 1 hired people that are out of the Fairfield County. Just ten percent from the people living here are going to be hired. So can you expect more people locally will be hired for units 2 and 3? Probably not.

(0010-87 [Wojcicki, Joe])

**Comment:** Now, the second problem is, yes, if we are going to have ability to teach these people, I have heard two persons from Midland Tech, and from Aiken Technical College. Now, I never heard that we have ability to teach these people. Aiken Technical College closed the nuclear program several years ago. They closed control and instrumentation program a few years ago. They have no chance to really reopen this program, they don't have the instructors, they don't have the facility to teach them. So you cannot really expect that your children, from the people living here in Jenkinsville, will have a chance to learn how to operate a nuclear facility, a generator, and all this stuff. (0010-88 [Wojcicki, Joe])

**Comment:** I appreciate that 19 million dollar check we saw spread across the paper the other day, handing it to Norma Brown, my wonderful treasurer. I don't see a whole lot of it going on out here, however. And as far as Jenkinsville, and prosperity, etcetera, somebody has some blinders on, I do believe. Now, I understand we were quite prosperous when the last nuclear power plant was built and I'm sure we will be again. I have heard stories about the beer joints that you wouldn't believe. And so I'm sure that if the construction people come we will have beer joints, and brothels, and I may open one myself, if that is what it takes to get some money, let's go for it. (0011-108 [Hager, Richard])

**Comment:** Since we don't know a way to stop nuclear plants from coming, because you are not going to tell us that, of course, so we feel as though if we are not going to stop them, and it

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is going to come, and you are building a ten billion dollar project, I would like to know how many minority contractors are going to be part of that project, from the community. (0011-24 [Marcharia, Kamau])

**Comment:** I think we have a 40 percent illiteracy rate in this county. But the challenge of jobs coming here with the tens, and tens of thousands of people who are unemployed, around this state, will come to this county with these good jobs. They might now know how to be plumbers or electricians, but they can take these tests, and get these jobs, and our people will be jobless trying to get a GED, or trying to get to a so-called key road process, to even get the jobs. Once again, we are going to be locked out of these jobs, and opportunities, and that is going to leave people in a state where crime might be increased. How would you address all of this? (0011-33 [Marcharia, Kamau])

**Comment:** Where is the economic benefit of these plants to Jenkinsville? I mean, I can drive down the road and it is like, where is the money from the plants? I'm an outsider, and I readily admit that. But, my gosh, there may have been some in the school with the tax money, and I know that there is taxes paid to the county. But this company has been negligent, it looks to me, in providing resources to this community to host these facilities. And if two new plants are going to come here, I certainly hope that there is a positive job impact for you. But that there is a better impact to the tax base for you, as well, because you are bearing the environmental and safety risk, and you ought to be compensated for taking that risk. (0011-78 [Clements, Tom])

**Comment:** And another thing about Jenkinsville, it has been the most prosperous community you can ever find in Fairfield County. Yes, it has gone down, people have their own businesses, you might see houses boarded, you might see stores vacant. Those people are deceased, they no longer live here. Maybe there is no one else to occupy those homes. Children leave, children don't come back. (0011-82 [Rabb, Ernestine])

**Comment:** To me putting those nuclear reactors here is the same thing as the government placing landfill in low socioeconomic neighborhoods. Just because, you know, people don't make a whole lot of money, they decide we are just going to put a landfill here, because it really doesn't matter, you know, we don't care about the people anyway. We just want to make sure we get our project done, and take care of our people. (0011-85 [Hill, Carol])

**Comment:** There was a comment made that people in Jenkinsville were a poor community, so therefore what does it matter? And I believe that is a public statement. Maybe some of you all should think about that, before you welcome these two new neighbors into our community. (0011-92 [Gunter, Deborah])

**Comment:** Why is it that the people of Jenkinsville, SC, have been chosen as the Tuskegee Experimental station for this project in the United States? Does the fact that we are an overwhelmingly poor, undereducated, elderly, African-American community have anything to do with this? Why isn't SCEG seeking to place these reactors on Lake Murray since it is those high priced subdivisions with their wealthy residents that are in much greater need of additional

power than we poor rural folk? (0041-15 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** And, is the impact on subsistence livelihood being taken into consideration by the NRC when determining whether or not these additional permits should be rendered? (0041-17 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** SR82 We don't need a three plant in the black residents we all ready have one put it somewhere else. (0050-4 [Respondent, Community Survey])

**Comment:** SR132 [My concern(s) about the two proposed reactors is/are] communities becoming own by whites . (0050-50 [Respondent, Community Survey])

**Comment:** SR44 [My concern(s) about the two proposed reactors is/are] All job positions being available to the whites first. (0051-37 [Respondent, Community Survey])

**Comment:** SR73 [My concern(s) about the two proposed reactors is/are] Communities being taken over by the whites, people not being able to afford electricity. (0051-68 [Respondent, Community Survey])

**Comment:** SR5 We raise green beans, peas, okra, tomatoes, corn to mention a few items which means we eat from garden numerous times a week. (0051-7 [Respondent, Community Survey])

**Response:** *Environmental justice impacts are those environmental impacts that disproportionately affect low-income and minority populations, or that impact subsistence practices or unusual resource dependencies. Environmental impacts include many physical, social, community, demographic, and economic impacts - including employment and tax revenue impacts. Chapters 4, 5, and 7 of the EIS will address all of these types of impacts. Redressing the grievances of participants in real estate transactions is outside the NRC's regulatory jurisdiction.*

**Comment:** SR128 [My concern(s) about the two proposed reactors is/are] That fairfield member get the jobs (0050-45 [Respondent, Community Survey])

**Comment:** SR138 Due to unemployment rate in Fairfield County, residents should have 1st offer [for jobs at VCSNS]. (0050-54 [Respondent, Community Survey])

**Response:** *Hiring choices for construction and operations labor force personnel is outside the scope of NRC's regulatory authority. The EIS, however, will evaluate the expected economic impacts of construction and operations activities including any local purchasing of production inputs, local and in-migrating labor, local spending of earnings, and tax revenues generated by local purchasing activities or from real property assessments in Chapters 4 and 5 of the EIS.*

### D.2.15 Comments Concerning Health - Non - Radiological

**Comment:** SR81 [My concern(s) about the two proposed reactors is/are] Fear, (0050-2 [Respondent, Community Survey])

**Response:** *The EIS for the proposed Units 2 and 3 will include an evaluation of the risks associated with potential severe accidents, including accidents that involve reactor core melts. The evaluation will include estimates of health and economic risks to a distance of 50 miles from exposure to the plume and from exposure to contaminated land and water. These risks will be compared with risks associated with the existing unit. In addition, the evaluation will include an estimate of the cumulative risk of severe accidents for all units at the site. This evaluation will be in Chapter 5 of the EIS.*

**Comment:** I think the nuclear power plant are more healthy for your lungs than coal fired (0028-1 [Whetsell, David])

**Response:** *The comments appear to express support for the proposed Units 2 and 3. Because they do not supply information related to environmental impacts of the plant, they will not be addressed in the EIS.*

**Comment:** Increasing noise from construction as well as an increase in traffic noise will have a large impact on the citizens who live near this facility. (0041-21 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Response:** *Local noise impacts of the proposed Units 2 and 3 are within the scope of the COL and will be evaluated in Chapter 4 of the EIS.*

**Comment:** I am concern about the dangers that the increase number of power lines will cause to my community. We all know that radiations come from power lines. I feel that our exposure will triple. What health risk or disease can I expect my children and grand child to suffer within 20 years? (0043-1 [Ginyard, Betty])

**Response:** *Potential impacts to members of the public from the transmission system associated with the proposed Units 2 and 3 are within the scope of the COL and will be evaluated in Chapter 5 of the EIS.*

**Comment:** SR145 [My concern(s) about the two proposed reactors is/are]2. Health (0050-63 [Respondent, Community Survey])

**Response:** *This comment refers to health impacts. As required by federal regulations, the impact analysis will contain an analysis and evaluation of components of the facility relating to the potential radiological and nonradiological health consequences from plant construction and operation. Chapters 4 and 5 of the EIS will address health impacts.*

**Comment:** It will also displace about 350 kilograms of mercury. This is based on a DOE Brookhaven National Lab study of 2004, based on large coal plants. To give you some of the idea of the impact of mercury emissions, in 2005 the National Institutes of Health study estimated a 9 billion dollar economic impact associated with mercury emissions, related to child brain development. A 2004 CDC study, Centers for Disease Control, estimates that 8 percent of women of childbearing age have unsafe levels of mercury. As well, that same study, estimated some 300,000 children at risk for mercury poisoning. (0010-176 [Knight, Travis])

**Response:** *The comment appears to express support for nuclear power generation as opposed to coal. Because the comment does not supply information related to environmental impacts of the plant, it will not be addressed in the EIS.*

## D.2.16 Comments Concerning Health - Radiological

**Comment:** It doesn't matter how many jobs are created by the nuclear power industry, if you are sick, you can't bring all this money to heaven or hell, wherever you will end up. (0010-113 [Cooper, Elaine])

**Comment:** It makes me think I work hard to try to leave the earth a better place than I found it, and I don't like to think that the land I live on is going to be radioactive for the next thousand human generations. Or take depleted uranium, we are talking about birth defects, 4.5 billion years. (0010-160 [Mason, Corry])

**Comment:** With respect to radiological aspects, it was mentioned here, again those were mentioned by some of the earlier speakers, radiological aspects, the health effects have been studied for more than 100 years. There is no --we cannot draw any correlation between nuclear power emissions and some of these ridiculously reported studies here, earlier tonight. While no, of course radiation is a hazard, like any other hazard, or carcinogen in the environment, and it is true, what one of the earlier speakers said, that there is no safe radiation level, of course. But the important thing is that radiation of any type, regardless of the source, is the same, and the health effects are the same (0010-177 [Knight, Travis])

**Comment:** So tonight I would really charge the NRC with taking every pain to research, thoroughly, the impacts of the radiation emissions the plant is allowed to release. You know, there are safe amounts of radiation, but addressing bio accumulation of that radiation, within the organisms in the lake and the reservoir, and in the water. A lot of the community members, in Jenkinsville, have to subsistence fish, or grow a garden in their backyard, to put food on the table every night. (0010-54 [Tansey, Sara])

**Comment:** I think that there should be more transparency in terms of the health risk. (0010-68 [Corbett, Susan])

**Comment:** Do not be fooled, for a second, in thinking there are no releases. Nuclear plants release radiation. And there is no -- the National Academy of Science says there is no safe level

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of radiation, there just isn't. It is all dangerous, it is all potentially dangerous to your health. (0010-70 [Corbett, Susan])

**Comment:** SR102 [My concern(s) about the two proposed reactors is/are] Increased problem. medical problem and exposure (0050-25 [Respondent, Community Survey])

**Comment:** SR102 [My concern(s) about the two proposed reactors is/are] Increased problem. shorter human lives (0050-26 [Respondent, Community Survey])

**Comment:** SR105 [My concern(s) about the two proposed reactors is/are] Radiation (0050-31 [Respondent, Community Survey])

**Comment:** SR114 [My concern(s) about the two proposed reactors is/are] sickness (0050-35 [Respondent, Community Survey])

**Comment:** loss of life due to contamination (0050-40 [Respondent, Community Survey])

**Comment:** SR124 [My concern(s) about the two proposed reactors is/are] long term effects of reactors (0050-41 [Respondent, Community Survey])

**Comment:** SR128 [My concern(s) about the two proposed reactors is/are] Concern about our health. (0050-46 [Respondent, Community Survey])

**Comment:** SR85 [My concern(s) about the two proposed reactors is/are] Cancer (0050-6 [Respondent, Community Survey])

**Comment:** SR147 [My concern(s) about the two proposed reactors is/are] People becoming ill from radiation, (0050-66 [Respondent, Community Survey])

**Comment:** SR162 [My concern(s) about the two proposed reactors is/are] cancer, sickness (0050-76 [Respondent, Community Survey])

**Comment:** SR165 [My concern(s) about the two proposed reactors is/are] Most of the people will get sick because we live around the nuclear plant. (0050-78 [Respondent, Community Survey])

**Comment:** SR13 [My concern(s) about the two proposed reactors is/are] Spreading disease by radiation. (0051-20 [Respondent, Community Survey])

**Comment:** SR14 [My concern(s) about the two proposed reactors is/are] My concern is about the people's health that live in the area or live near the plant. (0051-21 [Respondent, Community Survey])

**Comment:** SR25 [My concern(s) about the two proposed reactors is/are] Danger to your health. Too much radiation cause cancer. (0051-30 [Respondent, Community Survey])



**Comment:** SR34 [My concern(s) about the two proposed reactors is/are] Health concerns. (0051-33 [Respondent, Community Survey])

**Comment:** SR48 [My concern(s) about the two proposed reactors is/are] All the radiation seeking [sic] through the air, the soil, and the water getting into people's body causing them to become extremely sick. (0051-41 [Respondent, Community Survey])

**Comment:** SR50 [My concern(s) about the two proposed reactors is/are] Babies and wildlife borned deformed. (0051-44 [Respondent, Community Survey])

**Comment:** SR51 [My concern(s) about the two proposed reactors is/are] People becoming sick. (0051-45 [Respondent, Community Survey])

**Comment:** SR59 [My concern(s) about the two proposed reactors is/are] Long term health effects. i.e. cancer, birth defects (0051-51 [Respondent, Community Survey])

**Comment:** SR60 [My concern(s) about the two proposed reactors is/are] Cause a lot of sicken with the one now. (0051-52 [Respondent, Community Survey])

**Comment:** SR61 [My concern(s) about the two proposed reactors is/are] Health issue. (0051-53 [Respondent, Community Survey])

**Comment:** SR62 [My concern(s) about the two proposed reactors is/are] The two proposed reactors could cause cancer and sickness in people body of the community. (0051-54 [Respondent, Community Survey])

**Comment:** SR66 [My concern(s) about the two proposed reactors is/are] People becoming surverily [severely] ill from all the radiation. (0051-58 [Respondent, Community Survey])

**Comment:** SR67 [My concern(s) about the two proposed reactors is/are] Increase in deaths. (0051-59 [Respondent, Community Survey])

**Comment:** SR69 [My concern(s) about the two proposed reactors is/are] All the different sickness, like cancer, babies being borned deformed (0051-62 [Respondent, Community Survey])

**Comment:** SR72 [My concern(s) about the two proposed reactors is/are] ... sickness. (0051-67 [Respondent, Community Survey])

**Comment:** SR174 [My concern(s) about the two proposed reactors is/are] Danger and longtime effects. (0052-1 [Respondent, Community Survey])

**Comment:** SR182 [My concern(s) about the two proposed reactors is/are] Skin problem (0052-10 [Robin, Ella])

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**Comment:** SR183 [My concern(s) about the two proposed reactors is/are] Health issues, ... radiation. (0052-12 [Robinson, Terria])

**Comment:** SR184 [My concern(s) about the two proposed reactors is/are] Health concerns (0052-14 [Robinson, Claude])

**Comment:** SR186 [My concern(s) about the two proposed reactors is/are] Health problems. Radiation. (0052-18 [Respondent, Community Survey])

**Comment:** SR187 [My concern(s) about the two proposed reactors is/are] How will this effect our health (0052-19 [Respondent, Community Survey])

**Comment:** SR188 [My concern(s) about the two proposed reactors is/are] Will it harm us?. (0052-22 [Respondent, Community Survey])

**Comment:** SR189 [My concern(s) about the two proposed reactors is/are] Health concerns (0052-23 [Gatson, Viola])

**Comment:** SR190 [My concern(s) about the two proposed reactors is/are] Radiation. Our health. (0052-26 [Robinson, Bobby])

**Comment:** SR178 [My concern(s) about the two proposed reactors is/are] Radiation leaks. Health problem do [due] to radiation. (0052-6 [Respondent, Community Survey])

**Comment:** SR179 [My concern(s) about the two proposed reactors is/are] Health Concerns. Why do we need to [two] more? Radiation. (0052-7 [Respondent, Community Survey])

**Comment:** SR180 [My concern(s) about the two proposed reactors is/are] Radiation. Health Concerns. (0052-8 [Respondent, Community Survey])

**Comment:** SR181 [My concern(s) about the two proposed reactors is/are] How will it affect our health. (0052-9 [Respondent, Community Survey])

**Response:** *These comments refer to potential health effects due to radiation doses from release of radioactive material from the proposed Units 2 and 3. The impacts on human health from radiological emissions will be addressed in Chapter 5 of the EIS. NRC regulations also limit radiological releases and compliance with these limits will be examined during the safety analysis and will be documented in the safety evaluation report.*

**Comment:** a lot of people concerned about cancer rates, about the effects of radiation. (0010-18 [Berg, Michael])

**Comment:** And a lot of folks who have concerns, who have seen cancer mortality rates increase since the first reactor came in, are not very happy about two new reactors in their

neighborhood. A lot of folks I spoke with, and consider friends now, had children -- one of the most striking was an older gentleman in the community, whose 24 year old daughter had passed away from cancer. Another family who had lost a young son to leukemia. These are very real, very devastating concerns within the community. (0010-55 [Tansey, Sara])

**Comment:** I brought with me, tonight, a leukemia map of South Carolina. Now the insidious thing about radiation is you can't prove that it causes anything, that is what is kind of sad about it. But every county in this state that has a nuclear facility in it, has higher than average leukemia rates, including Fairfield County. And maybe that is just coincidental. But I would like to see that addressed in your study. I would like to see you project what the increased cancer rates, not only leukemia, but there is also, now, a higher, significantly higher group of thyroid cancers around the Oconee plant, there is three reactors up there. I want to see you project what are going to be the increased cancers in this area, from releases of that plant. (0010-72 [Corbett, Susan])

**Comment:** And the last thing that I'm going to say is that, and I was sitting over here, and I just got an email, a big report out today about world-wide higher incidences of leukemia around nuclear facilities. Not in this country, not just in this country, France, Germany, other countries are experiencing this. And I have, with me, a map, a DEHAP map, and it is just coincidence that every county in this state, that has a nuclear facility in it, has a higher than average leukemia rate. And there it is, there is the DEHAP. So I think that that needs to be a question that you all think about. How many added leukemias, or cancers, are you going to experience in this county from the daily releases, the accidental releases, of radiation into your environment? It is not going to be a huge number, but every person is a valuable cherished person to someone. (0011-121 [Corbett, Susan])

**Comment:** We often hear assertions that there are correlations between nuclear power plants, and cancer incidents. To the contrary, there has never been a credible study which linked health effects to nuclear power plants. (0011-51 [Wolfe, Clint])

**Response:** *These comments refer to health effects to populations around nuclear power plants. For this topic, NRC relies on the studies performed by the National Cancer Institute (NCI). The NRC will evaluate human health impacts of radiological emissions, and the results of this analysis will be presented in Chapter 5 of the EIS.*

**Comment:** So let's make some comparisons. A coal plant emits three times more radiation than a nuclear power plant. This is based on the Environmental Protection Agency data. And you can google this, go to EPA dose calculator, you can put it in, and you can estimate your own dose levels. That is assuming you live within 50 miles of the coal plant. The same thing for a nuclear plant, it is one-third that of the coal plant. Coal has uranium, thorium, it comes out of the ground. It has radon, radon daughters. Those get into the environment, of course, and that is where the dose results from.

Also for perspective, the radiation received from a nuclear power plant is equivalent of having a smoke detector in your home. I have nine, and I think it is well worth the risk, and I intend to

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keep my nine smoke detectors. It is 100 times less than watching TV, assuming you don't have one of the fancier new TVs, which don't emit any radiation. (0010-177 [Knight, Travis])

**Comment:** Some will tell you there is no safe level radiation. And that because radiation from nuclear power plants exist they, therefore, are not safe. Radiation emitting from nuclear power plants contribute less than one millirem a year to our average annual radiation dose of about 360 millirem per person. Sleeping with one's partner contributes about one millirem per year, to this average annual radiation dose. So if radiation exposure is what motivates you, you should get rid of your partner before you get rid of the nuclear power plants. (0011-52 [Wolfe, Clint])

**Comment:** -The average person receives more radiation taking a plane from NY to California than the amount released during TMI. (0026-4 [Sims, Raymond])

**Response:** *These comments are generally related to the radiation dose a member of the public would receive daily from all sources. They do not provide specific information related to the environmental impacts and therefore will not be evaluated further.*

**Comment:** And I want to ask people, those of you who live within ten miles of the plant? I'm curious if anybody has ever shown you, or worked with you about radiation detectors, so you might know if you are being exposed to any radiation. Mayor, has SCE&G, anybody trained people, or brought devices out here in the community? I mean, that is kind of shocking to me. I've got one, these cost, this is a very primitive device, or low end. But the Environmental Impact Statement, in my opinion, needs to review as the mayor hinted at, do people know about what they are being exposed to, is the city equipped with radiation devices, is there proper training that has gone on? You know, you should know what the background level is here, and to look for any kind of radiation that might be released from the plant. It is really shocking to hear that that hasn't happened. (0011-77 [Clements, Tom])

**Comment:** And we used to have someone to come by and check our soil, we do not see that any more. We have never had anyone come and test our radiation levels. And I just want to bring that awareness to the community, to the public, to SCE&G, to the NRC, and to anybody else that may have concerns for us in this community. (0011-91 [Gunter, Deborah])

**Comment:** Radioactive contaminants to the ground, air and water are irreversible. (0037-11 [Thomas, Ruth])

**Comment:** Many of the citizens in this area hunt and fish as part of their subsistence lifestyle. Gardening is also a vital part of life to many of the local citizens. One local family right outside the boundary of the VC Summer Station used to have soil samples taken from their property regularly by SCEG. No such sampling has occurred there in the past several years. They have, however, noticed a marked increase in the number of dead birds and trees on their property as well as one deer in particular that has a huge tumor on her head. What kind of on-going sampling is occurring on site? (0041-16 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Comment:** I am also concerned about the impact on the environment. As I looked at the SCA NA Impact Statement there was a number of items listed such as goats, cows, fish, but I did not see the animals that are hunted in this area such as deer, rabbit, ducks, and turkey. Why are they not listed? (0043-2 [Ginyard, Betty])

**Comment:** SR143 [My concern(s) about the two proposed reactors is/are] Soil/Agriculture pollution. (0050-59 [Respondent, Community Survey])

**Comment:** SR8 [We eat out of a home garden] Whenever we can get the vegetables to grow. Seems there is a problem with the soil in areas of my garden where vegetables used to grow. (0051-13 [Respondent, Community Survey])

**Comment:** SR10 [My concern(s) about the two proposed reactors is/are] Contamination. (0051-16 [Respondent, Community Survey])

**Comment:** SR49 [My concern(s) about the two proposed reactors is/are] a spill. (0051-42 [Respondent, Community Survey])

**Response:** *These comments relate to the Radiological Environmental Monitoring Program (REMP) and the airborne and liquid radioactive effluents from the proposed Units 2 and 3. Chapter 2 of the EIS will discuss the radiological environment around the proposed Units 2 and 3 and Chapter 5 will address the monitoring of effluent releases during operation and the impacts from these releases.*

**Comment:** So I would look to test those gardens, look at the food coming out of them, test the fish, account for accumulation of the food chain, of that radiation, and those very real impacts in the community. (0010-56 [Tansey, Sara])

**Comment:** SR1 I used to have a garden that I ate from daily, but I will never plant another garden because of the health risk associated with eating plants grown in my community. (0051-2 [Respondent, Community Survey])

**Comment:** SR16 [My concern(s) about the two proposed reactors is/are] Radiation leaks, health problems due to radiation. (0051-22 [Respondent, Community Survey])

**Comment:** SR17 [My concern(s) about the two proposed reactors is/are] health and environmental. (0051-23 [Respondent, Community Survey])

**Comment:** SR191 [My concern(s) about the two proposed reactors is/are] Health and well being. Why do we need two more? The negative affect for the people, the food we eat, the air we breathe, the water we drink. (0052-27 [Gatson, Annette])

**Response:** *These comments have two parts. One part relates to the Radiological Environmental Monitoring Program (REMP) and the airborne and liquid radioactive effluents*

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*from the proposed Units 2 and 3. Chapter 2 of the EIS will discuss the radiological environment around the proposed Units 2 and 3, and Chapter 5 will address the monitoring of effluent releases during operation and the impacts from these releases. The other part refers to potential health effects caused by operation of the proposed Units 2 and 3. The impacts on human health from radiological emissions will be addressed in Chapter 5 of the EIS.*

**Comment:** Now, it is interesting that this just happened a couple of weeks ago in New York. Indian Point, which is a big reactor outside of New York, they were finding strontium 90 in the groundwater. It turns out that the fuel pool from unit 1 was leaking. So they had to empty the pool, take out the rods, and put them in dry cask storage, and then they dumped 495,000 gallons of irradiated water into the Hudson river, because what the heck were they going to do with it? It was full of strontium, cesium, all kinds of very toxic radioactive contaminants. So that is what happens when you get these old plants. They start to fall apart, they start to break, they leak, what are you going to do with them? So you need to think about that. That is going to stay in your community for the rest of this century, and longer. (0011-120 [Corbett, Susan])

**Response:** *This comment is related to the unplanned release of radioactive material and aging of nuclear plants. The release and monitoring of radioactive material will be addressed in Chapter 5 of the EIS. NRC requirements are directed toward ensuring safe operation during the term of the license. Nuclear plant aging issues are addressed during the license renewal of an operating reactor.*

### D.2.17 Comments Concerning Accidents - Severe

**Comment:** I ask you also to include, in your Environmental Impact Statement, a review of the costs of severe accidents not properly evaluated, so far, by either the NRC or this Applicant. And that includes the cost of the, hopefully, improbable but now we know not impossible, accident of an intentional aircraft crash directed at these proposed new units. I submit that such a low probability, high consequence event would have catastrophic consequences for the people of Fairfield County, and likely for the people of Columbia, as well. That accident has been deemed non-credible, and was not included in the environmental evaluation submitted by the company. (0010-186 [Guild, Robert])

**Comment:** In conclusion, the EIS should carefully consider the increased risk of nuclear accidents .... associated with locating 3 reactors in a major metropolitan area. (0037-15 [Thomas, Ruth])

**Comment:** Risks associated with operating 3 reactors at VCSNS in a major metropolitan area with a population of 700,000. Since the early 1980s, when VCSNS Unit 1 was completed, the Columbia metropolitan area population has grown from 500,000 to more than 700,000. Further, the geographic reach of the metropolitan area population today is much closer to the VCSNS site than was true when the first unit was built. If the probability of a serious accident in each unit at VCSNS were an independent event, the probability would be additive over 3 units, thus tripling the risk when compared to a single unit. A more serious issue is whether, in fact, the

occurrence of an accident at one reactor increases the risk of an accident at the other two reactors in a 3-unit complex. If so, adding units 2 and 3 at VCSNS would more than triple the risk of an accident as compared to a single unit. The environmental impact statement should address whether this increased risk of an accident in a larger, more densely populated metropolitan area, is an acceptable risk. This risk is made more acute by the fact that Columbia is the state capital of South Carolina and that the metropolitan area houses major military bases. (0037-4 [Thomas, Ruth])

**Comment:** SR172 [My concern(s) about the two proposed reactors is/are] Danger of exploding. (0050-84 [Respondent, Community Survey])

**Comment:** SR8 [My concern(s) about the two proposed reactors is/are] If there were a disaster where would the residents go? How long would it take to clean up the area? Or could the area be cleaned up?. (0051-11 [Respondent, Community Survey])

**Comment:** SR189 [My concern(s) about the two proposed reactors is/are] explosions. (0052-24 [Gatson, Viola])

**Response:** *The EIS for the proposed Units 2 and 3 will include an evaluation of the risks associated with potential severe accidents, including accidents that involve reactor core melts. The evaluation will include estimates of health and economic risks to a distance of 50 miles from exposure to the plume and from exposure to contaminated land and water. These risks will be compared with risks associated with the existing unit. In addition, the evaluation will include an estimate of the cumulative risk of severe accidents for all units at the site. This evaluation will be in Chapter 5 of the EIS.*

## D.2.18 Comments Concerning the Uranium Fuel Cycle

**Comment:** On the issue of fuel, we have effectively, safely, dealt with spent fuel at the V.C. Summer site for about 26 years now. We will continue to safely and effectively deal with that fuel, until the federal government lives up to their obligation to take that fuel. (0010-101 [Byrne, Stephen])

**Comment:** So-called lethal nuclear waste has never killed anybody, and can be safely disposed, stored, or reprocessed (0010-109 [Wolfe, Clint])

**Comment:** Citizens of this area will be left with hundreds of additional tons of high level radioactive nuclear waste, stored on-site, creating environmental and health risks. All nuclear plants regularly release radiation into the environment. (0010-115 [Cooper, Elaine])

**Comment:** I wanted to compliment SCE&G on reducing risk in one area, and that is in the risk to their shareholders. You and I, the public, will eventually own all of this nuclear waste. And we will be financially, and otherwise, responsible for that waste. And the investors are protected

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from that risk. You and I, the public, are financially and otherwise responsible for all but a minor part of any cost related to a disaster. (0010-168 [Rudolph, Gerald])

**Comment:** The waste, a lot has been said about waste. The waste is small, if you compare all the waste from all 100-plus nuclear plants, for the last 50 years, commercial nuclear power, is one-fifth the volume of ash and sulphur generated by one coal plant in one year. It is a manageable amount of waste, and to think that we can't manage this waste and, ultimately, whether it goes to geologic disposal, or whether it is above ground storage, or whatever it may be, ultimately we are going to deal with it, and it is easily managed. And ultimately we will mine this as a resource, once we have exhausted existing fossil resources. It will be important, since 99 percent of that spent nuclear fuel, used nuclear fuel is, indeed, recyclable. (0010-180 [Knight, Travis])

**Comment:** I think there is a lot of problems with the expansion of nuclear power, such as that we still don't know what to do with the waste. (0010-21 [Berg, Michael])

**Comment:** As far as the nuclear waste, the Barnwell nuclear facility, according to the Department of Health and Environmental Control, is going to close in 2035. If that does happen, and I think there has been more feeling in the state not to accept out of state waste, and to close on schedule, where is the low level waste going to go? This has to be analyzed in the EIS. The high level nuclear waste I think the company said they have 19 years of storage in the spent fuel pools. Where is the high level waste going to go? Now reactors are storing the waste on-site, in big dry casks. But, basically, we are looking at a medium term, if not long-term high level nuclear waste storage facility expanded over what the current reactor would produce. As was mentioned earlier, the Yucca Mountain project is in trouble. So this waste could essentially be here forever. (0010-50 [Clements, Tom])

**Comment:** I think that we have to look for all the new reactors, that are being proposed right now, at the life cycle impacts from the uranium mining, to the transportation of uranium, to the enrichment process, all the way to waste management. Like a lot of folks have mentioned tonight, most of the waste that is produced at V.C. Summer, if two new reactors are built, will stay on-site. It will stay in Jenkinsville, in the community (0010-59 [Tansey, Sara])

**Comment:** The issue of waste, I've already spoken about that. It is going to sit here. We are condemning -- we may be providing energy for our children, but we are providing a nuclear waste storage dump for our great-great-grandchildren, to babysit and have to take care of. And how much is that going to cost, and what is that going to mean to them? And they are probably look back on us and say, what did you all leave us this stuff for? So I want to know what you are going to do with the waste. (0010-73 [Corbett, Susan])

**Comment:** The other thing that I'm concerned about, that they don't want to talk about, and it has been mentioned here, is the waste. You know, you have waste up there right now, you've got spent fuel. And now you have two more plants, you are going to have triple the amount of



high level, very hot, very radioactive spent fuel, and most likely it is going to stay there. I mean, I saw something today, you know Yucca Mountain is just not going to open. Three federal judges have said it is not safe. It is not going to open. The Nevadans don't want it. It is a NIMBY thing, they don't want it dumped in a hole in the ground in their backyard. So the reality of the situation is, you make it, you keep it. And that is what is going to end up happening here across the country. So you better think about that, because what that means is that your community is going to be stuck with dealing with aging reactors, aging fuel pools, and what is going to happen with that waste for the rest of this century? (0011-119 [Corbett, Susan])

**Comment:** On the subject of spent fuel, because I know there are a lot of questions about spent fuel, at V.C. Summer we have handled spent fuel successfully and safely for the last 26 years, and will continue to do that, until the Department of Energy lives up to their contractual obligation to take the fuel. We do have a contract with the Department of Energy for them to take the fuel, not only eventually from our existing V.C. Summer unit 1, but also from the two proposed units. And the government will, eventually, comply with the contract, whether it be moving the fuel to Yucca Mountain, whether it be through recycling, or other interim measures. (0011-39 [Archie, Jeff])

**Comment:** And my final comment has to do with Yucca Mountain. I'd like to make sure that the public also understands that Yucca Mountain, a deep geologic repository, is moving through the process. And the Department of Energy has submitted a license application to the NRC, and that was done just here recently, in June of 2008.

Now, it will take three to four years for that review, and public interaction, but that process has started. Funding for Yucca Mountain is going to be the issue and the challenge. Funding for Yucca Mountain must be appropriated, and Senator Harry Reid, of Nevada, holds the purse strings. So the message there is that there are some political issues, with Yucca Mountain, that I'm confident will be worked through. But Yucca Mountain is not a technical issue, it is truly a political issue. (0011-40 [Archie, Jeff])

**Comment:** The utilities have advanced the design of storage of spent fuel, as was just described [by Mr. Archie], while waiting on the Government to complete its commitment for the national storage site, or recycling. And even with those delays, the storage plan, at this facility, can meet the needs. (0011-47 [Rudnicki, Steve])

**Comment:** As far as the nuclear waste, a nuclear reactor produces about 20 tons of high level nuclear waste every year. So that means that there are about 500 tons of high level nuclear waste with no place to go out at the site. So two reactors, new ones, are going to produce about 40 tons of high level waste a year. The Yucca Mountain issue, out in Nevada, is not only a political issue, but is a technical issue. As was said, the license is under review by the Nuclear Regulatory Commission, but there are a lot of indicators that a license might not be able to be granted, because they can't meet the Environmental Protection Agency discharge standards at a certain length into the future. And there is also some issues about storing of the casks, and building protective shields over them. So the waste that comes out of these plants may be here forever. It looks to me like all the nuclear reactors are starting to store waste, in containers, on the sites that is what you could be facing. (0011-76 [Clements, Tom])

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**Comment:** Used fuel from the additional units will be stored on-site in their own spent fuel pools. Dry cask storage is an option for longer term storage if construction of a permanent federal repository does not come on line. (0033-11 [Merrill, Denver])

**Comment:** LWVSC [League of Women Voters of South Carolina] agrees with expressions from our citizens that Scoping include the following: Clarification regarding onsite permanent storage. One local official expressed conviction that the spent fuel would go to Nevada. (0035-6 [Zia, Barbara])

**Comment:** The concentration of spent fuel on the site, given the unknown startup of Yucca Mountain or other permanent storage sites, are a risk to the quality of the human environment in the Columbia metropolitan area and in South Carolina. (0037-12 [Thomas, Ruth])

**Comment:** Dangers of containing and managing the large volumes of spent fuel that will be stored on the site. Because the Yucca Mountain long term storage facility may never be built, spent fuel will be stored on site for the foreseeable future, and perhaps forever. The volume of spent fuel for 3 reactors poses a substantial risk for environmental damage. (0037-3 [Thomas, Ruth])

**Comment:** It is not fair to construct these plants and to store this waste which will be a part of their lives, their children's lives and so on for decades and not take the time and make the effort to help these people understand the issues. (0048-2 [Lewis, Crosby])

**Comment:** Number three I wanted to mention is, basically, there is no free lunch. I agree that nuclear power is probably the most efficient power source that we have available right now. But with that efficiency also comes the risk involved. It is the highest risk. We don't have any place to put these fuel rods. I think other folks have said that nobody really wants them, so if you build it, you are going to be stuck with it. I agree with that. (0049-41 [Hartmeier, Gina])

**Comment:** SR92 [My concern(s) about the two proposed reactors is/are] Nuclear waste. (0050-13 [Respondent, Community Survey])

**Comment:** SR102 [My concern(s) about the two proposed reactors is/are] Increased problem. nuclear waste (0050-29 [Respondent, Community Survey])

**Comment:** SR7 [My concern(s) about the two proposed reactors is/are] What will be done with the waste that is said to be radioactive for thousands of years. (0051-10 [Respondent, Community Survey])

**Response:** *These comments provide general information in support of the applicant's COL. They do not provide any specific information related to the environmental effects of the proposed action and will not be evaluated in the EIS.*

**Comment:** The comment that if we run out of uranium in the United States is not true. We have the third largest reserves in the world, when you consider all grades of uranium, and the fact that uranium is such a small part of the overall cost of the generation of nuclear power, it is about five percent. Any volatility in the price of uranium is easily absorbed. So we have adequate uranium reserves. (0010-173 [Knight, Travis])

**Comment:** I also want you to address the supply of uranium. Everybody seems to think that this is some way to get away from being dependent on foreign sources. Well, there is not much uranium left in this country. So we are going to have to go to Kazikstan, or South Africa, or wherever it is, and try to get enough uranium, in the future, for all these nuclear power plants. And we are going to be right back in a situation where we are having to negotiate with foreign governments for the supply of uranium. So let's get a reading on the uranium supply, and how consistent, and what the price is going to be on that. (0010-74 [Corbett, Susan])

**Response:** *These comments discuss the available uranium ore supply and associated potential impact on the viability of the nuclear industry. The NRC will analyze the impact of irretrievable and irreversible resources in Chapter 10 of the EIS.*

## D.2.19 Comments Concerning Transportation

**Comment:** Waste disposal. Disposal of hazardous waste material from the [Summer] site must be carefully reviewed. Potential hazards during waste removal and transport to an appropriate facility must be documented in the EIS. (0012-15 [Hall, Timothy N.]

**Response:** *The radiological and nonradiological impacts of transporting spent nuclear fuel and radioactive waste to/from the VCSNS site and alternative sites will be addressed in Chapter 6 of the EIS.*

**Comment:** Will the railroad spur need extending in order to service the expanded facility? (0041-11 [Barnes, Jenifer] [Brendell, Julie] [Mann, Deborah] [Moore, Robbie])

**Response:** *Traffic-management planning to support construction and operation of the proposed Units 2 and 3 will be addressed in Chapters 4 and 5 of the EIS.*

## D.2.20 Comments Concerning Decommissioning

**Comment:** A lot of you that are from this county are aware of the power reactor. That is a reactor that was on the drawing board before I was born. It operated and shut down in 1967, here in Fairfield County. We put a fence around it, and we locked it down for 30 years. In 1997 we came back to it and started a decommissioning process. We will be finished with that decommissioning process this year. So we have an obligation to decommission that reactor in that site, we are living up to that obligation, and we will live up to our obligations to the environment, and the community, with these new reactors. (0010-104 [Byrne, Stephen])

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**Response:** *This comment concerns decommissioning. 10 CFR Section 50.75 requires the applicant to provide reasonable assurance that funding will be available for decommissioning activities at the time it is needed. The environmental impact of decommissioning a permanently shut down commercial nuclear power reactor will be discussed in Chapter 6 of the EIS. In addition, the staff may consider information from Supplement 1 to NUREG-0586, Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, which was published in 2002, when analyzing the expected impacts of decommissioning.*

### D.2.21 Comments Concerning Cumulative Impacts

**Comment:** The water impact was mentioned earlier. The two reactors are going to use about 35 million gallons of water from the Monticello Reservoir, which could restrict flow into the Broad river. With the two new Duke reactors upstream, if they go forward, and Duke hasn't decided on that, 35 million gallons, from those reactors, Duke is also planning a coal plant on the Broad river, right on the North Carolina side, so we are talking about 80 million gallons of evaporative cooling water removed from the Broad river basin. So the cumulative effect of the two Duke reactors, and the new coal plant, have to be examined in the EIS. (0010-51 [Clements, Tom])

**Response:** *These comments refer to the consumptive use of water. The construction and operation of a nuclear plant involves the consumption of water. The NRC staff will independently assess the impact of these consumptive water losses on the sustainability of both the local and regional water resources. This assessment will consider both current and future conditions, including changes in water demands to serve the needs of the future population, and changes in water supply. While the NRC does not regulate or manage water resources, it does have the responsibility under NEPA to assess and disclose the impacts of the proposed action on water resources. The staff's assessment of the impacts on the sustainability of water resources will be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively. Cumulative impacts will be addressed in Chapter 7. In addition, staff will evaluate system design alternatives, including cooling water system designs, in Chapter 9.*

**Comment:** And there is a lot of concern about global warming, and climate change. And a lot of folks are really giving nuclear energy sort of the emissions free status that it doesn't deserve. (0010-58 [Tansey, Sara])

**Response:** *The NRC is responsible for conducting an environmental review of the COL application, but it is not responsible for establishing policies related to emission of nonradiological pollutants or to global warming. While it is recognized that the issue is of national importance, policy is outside the scope of this review. The cumulative impacts of the proposed Units 2 and 3 construction and operation related to global warming will be addressed in Chapter 7 of the EIS.*

**Comment:** Since we are here for an environmental hearing it would be instructive to know what environmental impacts have resulted from 25 years of operation of the current unit at the site. (0011-50 [Wolfe, Clint])

**Response:** *As a baseline for assessing environmental impacts of the proposed Units 2 and 3, a number of reports will be identified in the EIS describing the environmental impacts at the current site.*

**Comment:** -Nuclear power is cleaner than coal and, environmentally speaking, causing virtually no harm to the air or water supplies if proper safety practices that are already in place are followed and updated regularly. Nuclear power does not produce harmful gas byproducts such as NO<sub>2</sub>, CO, etc. (0026-1 [Sims, Raymond])

**Comment:** Nuclear plants do not burn fossil fuels and thus do not emit pollutants associated with smog, acid rain and high ozone levels. Nuclear plants also do not produce greenhouse gases that many believe lead to global warming. As our nation looks for ways to clean up our air and address potential sources of global warming, nuclear plants must be a part of the solution. (0033-2 [Merrill, Denver])

**Response:** *These comments provide general opinions about nuclear power that do not provide any specific information relating to the environmental impacts of the proposed action. Therefore, these comments will not be addressed further in the EIS.*

**Comment:** Approving localization of reactors with such high needs for cooling water in the drought zone must list emergency shut down procedures and sources of environment and people as its component. The focus must be especially on the water, energy, and food supply. (0044-12 [Wojcicki, Joe])

**Comment:** Deficit in water supply must respect agricultural / food production needs, especially if created by an electric energy production. (0044-13 [Wojcicki, Joe])

**Response:** *Changes in the availability of the water resources by competing demands and long-term variability will be addressed in Chapter 7 of the EIS on cumulative impacts.*

**Comment:** My issues may seem petty to some of you all, but to me, to my family, and maybe to others of you all, out there, they may be serious. I just want to make some comments about the wildlife, the environment, the ground, the soil, the air, the trees that we need to breathe, that are dying on our property. The grass is not growing for my horses to eat. The vegetables in the garden is not producing. The trees that are on our property that are dying day by day, that we see that are 20 or 40 years old that are just dying. (0011-90 [Gunter, Deborah])

**Response:** *The radiological impacts of reactor operation, including impacts to biota, will be addressed in Chapter 5 of the EIS.*

**Comment:** CO<sub>2</sub> Emissions. The EIS should consider the potential environmental impacts associated with production of raw materials for the new nuclear site, as well as any related improvements in infrastructure necessary to bring those raw materials into the Summer site or to transport hazardous wastes from the site. Please consider the entire supply chain,

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transportation, use, and disposal in your analysis of these air quality effects. (0012-1 [Hall, Timothy N.]

**Response:** *The airborne emissions from the proposed Units 2 and 3 will be considered in the evaluation of potential impacts. The impacts on air quality resulting from construction and operation of proposed Units 2 and 3 will be discussed in Chapters 4 and 5 of the EIS. The impacts of nuclear power generation on climate change will be addressed in Chapter 7 of the EIS.*

**Comment:** In conclusion, the EIS should carefully consider .....the environmental hazards associated with locating 3 reactors in a major metropolitan area. (0037-16 [Thomas, Ruth])

**Response:** *The Council on Environmental Quality advises that when there are potentially a very large number of alternatives, only a reasonable number of examples covering the full spectrum of alternatives must be analyzed and compared in an EIS (46 FR 18027). NRC staff will review the alternative site-selection process to determine whether it is systematic, employs reasonable selection criteria, and constitutes an acceptable number of reasonable sites for consideration. The process must enable the applicant and reviewers to evaluate and select proposed and alternate sites based on environmental preference and obvious superiority. The process and results will be provided in Chapter 9 of the EIS.*

### D.2.22 Comments Concerning the Need for Power

**Comment:** The entire US Transmission System would have to be wastefully reengineered to provide vast and inefficient electrical power transfers into these unbalanced networks. The system already has large problems with system stability. Note: the several massive power failures in the Northeast, Midwest, and Canadian regions in just the past few years. All due to system stability problems. (0001-4 [Byrd, William A.]

**Response:** *Transmission system configuration and stability is addressed in the EIS only to the extent that new or expanding existing transmission corridors and their associated impacts are assessed and disclosed. Network engineering is outside the scope of the environmental review and will not be considered in the EIS.*

**Comment:** The U.S. Energy Information Administration (EIA) predicts that total electricity sales will increase by 29 percent, from 3,659 billion kilowatt-hours in 2006 to 4,705 billion in 2030. No one resource alone can meet that demand. The country needs an energy mix that includes renewable energy, wind, solar, natural gas, and nuclear. Nuclear reactors provide baseload power -that is, they are reliable, producing energy 24 hours a day at a constant rate to supply a region's regular energy needs. Renewables -like wind and solar -are intermittent resources that will require a baseload system in order to have backup power available to ensure reliability of supply. (0004-2 [Winsor, Susan A.]

**Response:** *Alternative energy sources, including combinations of sources such as fossil fuels and renewable energy sources, will be evaluated and addressed in Chapter 9 of the EIS in comparison with the proposed action.*

**Comment:** And, believe me, in our region today, and in the State of South Carolina, in order to support economic development, we need a source of sustainable long-term energy. We believe, enthusiastically, at the College, that nuclear needs to be a part of that. And, in that respect, our job is to educate a skilled workforce, in order to make these two projects go forward. (0010-4 [White, Sonny])

**Response:** *This comment expresses general support for the proposed Units 2 and 3 and the associated COL application. It provides no information relevant to the environmental review of the COL application and therefore will not be considered further.*

**Comment:** As we all know, manufacturing needs power. The continued availability of reliable, economical energy is critical to maintaining Newberry County's current industrial base, and to attracting new industry to our county. If we are going to continue to meet the needs of our existing power requirements, and have the ability to meet the needs of new growth and development, we must invest in new power generation facilities. (0010-12 [Powers, Theresa])

**Response:** *The need for power analysis will be addressed in Chapter 8 of the EIS.*

**Comment:** I charge you, and ask you to consider fully the need for this plant. That is the forecast of growth and demand for electricity in the SCE&G and Santee Cooper service area. I submit to you that SCE&G and Santee Cooper have performed no current load forecasts justifying the need for this plant. And, in fact, the most recent load forecast by SCE&G predates the economic collapse that we all are experiencing and suffering from. While other utilities in the region, including Duke Power Company, have substantially reduced their load forecast, showing some recognition of the current economic reality, SCE&G refuses to do so. And their environmental report contains no updated load forecast. (0010-129 [Guild, Robert])

**Comment:** ...after a three decade hiatus, utility companies like SCANA are pursuing plans to build more than 30 new reactors in several areas of the country, including here in South Carolina. This is welcome news for an energy-hungry region and nation that must find new and better ways to meet a growing demand. (0010-183 [Toole, W.R. (Rick)])

**Comment:** We certainly do have to look for alternative means of power, and the country of France, a couple of years ago, went 80 percent nuclear power. That was a very courageous move. And I think we have to be on the lookout for better ways to have power. We are going to certainly need it, and we are finding more ways to use power. (0010-45 [Kinley, Mary Lynn])

**Comment:** We [Showa Denko Carbon, Ridgeville, SC] use a large amount of electrical power in our process, as do our customers. We are strongly in favor of conservation, wind, solar,

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nuclear, coal, gas, you name it. We believe that the only way this country, and our company, can be successful is if we have all of these resources available to us. My company, we would like to expand our facility, double it really. We are going to need a lot of additional electrical energy if we do do that. (0010-80 [Whitten, Robert])

**Comment:** The State of Security clearance's Office of Research and Statistics, projects that the population of our state will grow by approximately a million more people over the next 20 years. Our state's available surplus electricity power supply continues to dwindle, in its efforts to meet a continuously increasing demand for that power. I also am a member of the South Carolina Economic Developers Association, and have been involved in the recruitment of many industries to our state. The availability of electricity power is vital to our industrial community, and to our economic development efforts here in the state. (0011-10 [Clary, C. Douglas, Jr.]

**Comment:** I have watched the Midlands grow in the northeast, from Clemson road being a two lane road, running through the pine trees, to now being a five lane thoroughfare, with housing all over the place. That type of growth requires electrical power. (0011-42 [Rudnicki, Steve])

**Comment:** Where are we going to need this electricity? I have nothing against nuclear, because this is going to be a big two producer of two gigawatts of the power. But telling us that this is going to be baseload for the people, for the residents, is completely wrong. These million people that are going to come to our state, is probably going to live in completely different houses. The houses are going to be designed with completely different application for appliances, and needs for the electricity. I just, a few minutes ago, was listening how bad is solar.

But there will be, also, the solar on the roof of our houses. But also, please remember, that we as people need in our houses, we need to have electricity when it is very warm. We need to have air conditioners running. Now, if -- and we need, also, if we install heat pump, we need to have this heat pump running on the electricity in the wintertime, right now. So if we are going to use geothermal energy, we don't need any 24 hours power from any sources. So in this case, this I think that will be much better for South Carolina Electric and Gas to look for the customer of this two gigawatt, you need somewhere there is going to be a huge industry, like for example port [huge port near Savannah, SC, proposed Jasper Ocean Terminal]. (0011-60 [Wojcicki, Joe])

**Comment:** South Carolina must build for the planned growth in demand for electricity. (0017-4 [Campbell, Paul G., Jr.] [Duncan, Jeff] [Harrison, James H.] [Laffitte, Sterling] [Lummus, John] [Ott, Harry L., Jr.] [Pinson, Lewis E.] [Rawl, Otis B.] [Sandifer, Bill] [Smith, J. Roland] [Sottile, Mike] [Thordahl, Jeff])

**Comment:** South Carolina must build in anticipation of the projected growth in population and associated demand for electricity. Further, it is absolutely essential to the state's manufacturing base that we maintain constant access to a safe, affordable and reliable source of electricity. (0021-4 [Lanier, Hope])

**Comment:** We strongly believe that the new units will provide needed electrical power for many years. (0031-2 [Beaman, Charles, Jr.] [Benjamin, Steve] [McLeese, Ike] [Novinger, Cathy] [Speth, Charles Ted])



**Comment:** Nuclear power has been a safe, low cost provider in South Carolina for a long time and we feel the new plants will be successful through the review of the combined license application by the Nuclear Regulatory Commission (NRC). Without this new generation capacity our state's economy could grind to a halt in the near future as power shortages start to occur. Once this occurs, it will be too late to act. (0032-2 [Gregorie, Jim])

**Comment:** Forecast for energy demand in the future must be a function of the projected increase in the state population as well as big energy customers, e.g. JOT. Common sense does not allow to compare apples to oranges, e.g. JOT 24/7 base load to residential power as a time function demand. (0044-15 [Wojcicki, Joe])

**Comment:** It is no secret that South Carolina must build for the planned growth in demand for electricity. (0046-4 [Hendrix, Samuel H.] [Hope, Leslie B.]

**Comment:** South Carolina is expecting an increase in demand for electricity over the next couple of decades as the population continues to grow. Nuclear energy, which is safe, environmentally-friendly, efficient- and low-cost, is an essential part of meeting South Carolina's future needs with a balanced energy policy that includes all energy resources. (0047-2 [Whatley, Michael])

**Comment:** SR12 [My concern(s) about the two proposed reactors is/are] Why do we need two more reactors? (0051-18 [Respondent, Community Survey])

**Comment:** SR188 [My concern(s) about the two proposed reactors is/are] Why do we need them? (0052-21 [Respondent, Community Survey])

**Comment:** SR189 [My concern(s) about the two proposed reactors is/are] Why do we need them?. (0052-25 [Gatson, Viola])

**Response:** *The need for power is within the scope of the environmental review and will be reviewed in Chapter 8 of the EIS. The Need for Power analysis used in the applicant's Environmental Report was prepared by SCE&G through the Combined Application for the Certificate of Public Convenience and Necessity (Docket No. 2008-196-E), and Santee Cooper through an annual Integrated Resource Plan (South Carolina Public Service Authority IRP, 2008), and submitted to the requisite State bodies for evaluation. NRC staff will review the applicant's Need for Power analysis and determine if it is (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty.*

**Comment:** We have, what I have seen reported, as the fourth highest per capita consumptions of electricity in the United States, and some of the highest per household electric bills, coupled with low, relatively low electric rates. And that is a product of the fact that we use that electricity resource extremely inefficiently. There are a lot of savings available that will make the lives of the people in Fairfield County better. The people of Fairfield County do not need to waste electricity by heating and air conditioning the great outdoors, because SCE&G fails to

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provide us the tools to use their power efficiently. They want us to waste their electricity to justify the need for this new plant. (0010-131 [Guild, Robert])

**Comment:** I think, beyond the breadth of the community, that we have to be thinking about global impacts. Right now we face a crossroads in energy decisions, and how we are going to create, produce, and supply energy. (0010-57 [Tansey, Sara])

**Comment:** The question really is do we need the additional nuclear power at this time, or don't we? Or do we need it some time in the future. The real issue, here in South Carolina, is simply the fact that we are probably one of the most wasteful states in terms of energy usage. And to give you a very simple example, let's say that it is 40 degrees outside, and you are cold, your window is open, and so what would you normally do? Would you go turn up the thermostat, or would you close the window? Well, typically you would close the window. What if you didn't know that the window was open? That is the situation in most South Carolina residential homes today. Typical figures indicate, and I'm talking mostly from national studies, that a 20 to 30 percent energy waste figure is typical in almost every house that is out there, that has been built, probably, more than five years ago. (0011-123 [Newton, Larry])

**Comment:** Our state's Public Service Commission has required a Demand Side Management (DSM) Study by the applicant, and we request that any further legal action await full completion of the DSM Study that has been directed for June 2009. (0035-4 [Zia, Barbara])

**Response:** *The NRC does not establish public policy regarding electric power supply alternatives nor does it promote the use of nuclear power as a preferred energy alternative. Requesting legal action is outside the scope of the environmental review. However, Chapter 8 of the EIS will include review of energy efficiency and demand-side management (DSM) as updated by the June 2009 proposed issuance of SCE&G DSM Programs, and their impact on the load forecast and territory need for power. Chapter 9 of the EIS will include the no-action alternative, new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives, the potential for environmental and economic impacts will be assessed against that of the proposed Units 2 and 3. If one of the potentially acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

**Comment:** Now, if the feds think they can do two million homes for six billion dollars, how much do you think we can do in South Carolina? You could do two-thirds of the state. So the problem here is not the lack of money, it is the way the money is being allocated. So you might ask yourself, why isn't it being allocated better?

Well, simply the fact is that it takes three people to make this work. The first person, or first organization that should really be helping you is the PSC. They are charged for looking after the customer. If they were alert, and if they were energetic, like they are in some other states, and their legislature was behind them, you would see that they would be putting together programs that would encourage energy efficiency. They might be promoting things like decoupling. That means SCE&G could take their seven billion dollar investment, and put it into energy efficiency,

instead of building these new plants. Do you think that maybe they need these plants right now, or they need them at all? It is a question nobody can answer, because nobody has bothered to look at it. (0011-126 [Newton, Larry])

**Response:** *Decisions regarding which generation sources and alternatives to deploy are made by the applicant and regulatory bodies such as State energy-planning agencies and public utility commissions. The alternatives must be technically viable, feasible, and competitive. Chapter 8 will review the impacts of energy efficiency and demand-side management on the need for power and load forecasts. Alternative actions such as the no-action alternative, new generation alternatives, purchased electrical power, energy efficiency, alternative technologies (including renewable energy such as wind and solar), and the combination of alternatives will be considered in Chapter 9 of the EIS.*

**Comment:** Nuclear power is the only emissions-free source of baseload generation today. And it is a perfect ingredient for an environmentally responsible generation portfolio. (0010-147 [Thomas, Ralph])

**Response:** *The NRC evaluates energy alternatives as part of its review of applications for new nuclear power plants under NEPA, and it regulates the nuclear industry to protect the public health and safety within existing policy. The discussion of alternative energy sources in Chapter 9 of the EIS will describe the potential impacts, (including emissions estimates) from alternative energy sources such as fossil-fired and renewable energy facilities.*

### D.2.23 Comments Concerning Alternatives - Energy

**Comment:** With at least one new coal plant and four new nuclear plants proposed for construction, and only hollow gestures of interest in energy conservation and alternative strategies, it is time for all of us to rethink our energy future.

Part of the NRC responsibility in developing the EIS and NEPA is to look at alternatives. The League of Women Voters of South Carolina urges public officials at NRC and in South Carolina to give efficiency, conservation and renewable energy serious consideration before committing to risky new nuclear and coal plant projects.

Compared with other states, South Carolina ranks very high in per capita energy consumption, particularly electricity. We do need air conditioners in South Carolina, but not to the point of needing sweaters. There is much we can do to decrease our demands for residential and non-residential electricity.

The League of Women Voters and other citizen groups can't understand why off-shore wind potential, which is indicated to be available here, is not on the visible planning board in South Carolina. Other states are monitoring offshore wind, and reports indicate that South Carolina's offshore wind is a viable source of renewable energy.

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One of our state's goals must be to develop policies that enable utility companies to benefit financially from energy conservation. This might be as simple as providing loans to customers for smart energy efficiency investments that might not be financed traditionally. We need not experiment, as there are many utility conservation models around the country.

Energy conservation and renewable energy alternatives have additional benefits. Rather than committing citizen and corporate resources to more nuclear and coal power plants--and purchasing power plant equipment from other countries--we could be creating new jobs by producing materials and equipment here. (0009-2 [Rhodes, Suzanne])

**Comment:** I ask you to consider, fully, the cost of alternatives that are more environmentally attractive than building nuclear power plants with their attendant risks and dangers, and costs. Those include aggressive demand side management, energy efficiency, and alternative renewable energy sources. I won't belabor the point, except to say that the Governor's Climate Energy and Commerce Committee, charged by Governor Sanford, issued a report, only this last year, contradicting SCE&G's grossly pessimistic view about the prospects of efficiency and alternatives. And, instead, as others have said tonight, identifying the short term availability of large amounts of offshore wind, and a very, very significant potential savings in energy efficiency. I would just note, in passing, South Carolina has some of the least efficient use of electric energy in the country. (0010-130 [Guild, Robert])

**Comment:** Renewable energy is important, but it cannot generate enough power by the time we need it. Landfill biogas generation is a great win for everyone, including electricity utility customers. But its potential capacity is very limited. Solar and wind energy are promising, but with current technologies, practical baseload solutions, because they can only generate power when the sun is shining and the wind is blowing (0010-148 [Thomas, Ralph])

**Comment:** With respect to other sources, wind and solar, what was said earlier, nuclear power is, indeed green. It is as green as wind, hydro, and solar. It emits about, when you consider the full life cycle cost, the full energy chain, it is about two and a half grams carbon equivalent per kilowatt hour. And those are the facts backed up by a 2004 OACDC study. (0010-178 [Knight, Travis])

**Comment:** Part of the NRC responsibility, and actually part of the responsibility of the state officials, is to look at other alternatives, whether it is EIS or the NEPA, and efficiency, conservation, and renewables, should get a careful look before we go further with this huge investment. (0010-53 [Rhodes, Suzanne])

**Comment:** What we actually need, what I feel we need in this public forum, is we are all for conservation, none of us are against it. Some of us, most of us, half of us, I don't know, want nuclear energy. But I think what we all need is a balance. A balance in this approach to this energy solution. We need to get up there and bring up solar cells, bring up geothermal, clean coal, and there is such thing as clean coal, biomass, nuclear, have a good mix out there, where we have a balanced approach toward solving our energy problems. (0010-96 [Von Kaenel, Hoyt])

**Comment:** And a lot of these costs [electricity production cost per kwh] that they are projecting now make solar and wind very attractive. I just took part in a recent webinar. A professor from Clemson said they have done a big study of off-shore wind in South Carolina, not on-shore because we don't have a lot of on-shore wind, but off-shore wind. His studies show that we have 4,000 megawatts of off-shore wind power. That is 4,000 megawatts that we could get up and running in five years. And it wouldn't cost 20 cents a kilowatt hour. We could power all of our coastal cities with that off-shore wind. And that wasn't really considered in forward. the proposal that the utility put forward. (0011-116 [Corbett, Susan])

**Comment:** A recent poll by Bisconti Research showed 72 percent of Americans felt that solar power would be our major source of electricity by 2023. Now the Energy Information Agency is a government organization that is charged with compiling data, and statistics, and reporting on energy data, and energy trends in the country. And when Bisconti asked them what the percent solar would be in 2023, they said the answer was 0.2 percent, or about the same as it is now. Wind fared somewhat better, in that 65 percent of the people felt wind would be a major contributor by 2023, and the EIA estimated that wind contribution at 2.4 percent. So the lure of renewable energy sources is grounded more in wishful thinking, and expectations of huge windfalls for those hawking everything from solar to animal byproducts. (0011-54 [Wolfe, Clint])

**Comment:** -The impact of solar and wind would not be significant compared to nuclear. Where would wind turbines be erected? We would have to cut down trees thus having a huge impact on the environment. Similarly, there would need to be solar fields. Again, this requires cutting tress and perhaps relocating people. Nuclear is by far the most reliable and economical decision. (0026-6 [Sims, Raymond])

**Comment:** Is SCEG doing any kind of study for alternative energy in SC? I think this should be done instead of another reactor and before another increase in cost to consumers be approved. (0027-1 [Wiggs, Rose Mary])

**Comment:** I would also like you to address alternative ways for power and energy saving. If they put lock and dams on most of our major rivers. It wood be used for hydro-power and for barges that are 90% more efficient than a truck. You could also suggest they use bioenergy also because it is renewable. Just my thoughts. (0028-2 [Whetsell, David])

**Comment:** Additionally, nuclear power is much more reliable and cost effective than renewable technologies like wind and solar, which cannot provide the capacity or around-the-clock generation required to meet South Carolina's near term energy needs. The sun doesn't always shine and the wind doesn't always blow; but nuclear plants can operate at their maximum output 24 hours a day, seven days a week for months on end. This helps hold down the cost of nuclear-generated electricity. To produce as much electricity as the V.C. Summer Station, a solar-powered plant would require panels covering an area the size of Columbia, S.C., while equivalent wind generation would require hundreds of turbines stretching across the entire South Carolina coast. By comparison, V.C. Summer takes up only a few square miles. (0033-6 [Merrill, Denver])

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**Comment:** And when compared with fossil fuel sources, nuclear plants are extremely efficient. One uranium fuel pellet “about the size of a pencil eraser” can produce about the same amount of electricity as 17,000 cubic feet of natural gas, 1,780 pounds of coal or 149 gallons of oil. V.C. Summer’s reactors will utilize 157 fuel bundles each that are designed to last four-and-a-half years before being replaced. Clearly, that’s a cost benefit as well as an environmental benefit. (0033-8 [Merrill, Denver])

**Comment:** The League of Women Voters of South Carolina (LWVSC) urges public officials to give conservation and renewable energy serious consideration before committing to risky new nuclear and coal plant projects (0035-3 [Zia, Barbara])

**Comment:** This project is good for our planet, it reduces the carbon footprint. There is no other mechanism that the scientific community has developed that generates this much power, this clean. Windmill, solar, it doesn't work. If it did it would be -- people in America love to make money. If you could make money selling wind energy and solar, somebody would be doing it. I don't see any solar or wind farms off the coast of South Carolina. It doesn't make financial sense. (0049-23 [Dennis, Dan])

**Response:** *The need for power is within the scope of the environmental review and will be reviewed in Chapter 8 of the EIS. The Need for Power analysis used in the applicant's Environmental Report was prepared by SCE&G through the Combined Application for the Certificate of Public Convenience and Necessity (Docket No. 2008-196-E), and Santee Cooper through an annual Integrated Resource Plan (South Carolina Public Service Authority IRP, 2008), and submitted to the requisite State bodies for evaluation. NRC staff will review the applicant's Need for Power analysis and determine if it is (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty.*

**Comment:** Solar collectors are too inefficient, and produce too little power for the amount of surface area that they require. We would have to cover half of the US with Solar Collectors, just to provide for the amount of power the USA uses in the other half: today. This fact will not change any time soon with any new solar cells presently being scientifically investigated. (0001-2 [Byrd, William A.]

**Comment:** Wind turbines produce too little power per unit and require vast arrays to provide any meaningful power. They kill migrating birds by the thousands. They also produce certain low frequency sound waves that are already causing health concerns to local citizens. Both Solar and Wind have a giant problem. What do you do when the sun doesn't shine or the wind stops blowing? Just last summer the city of Houston, Texas, lost power because a local wind farm stopped producing power, due to no wind. Where is the power going to come from to replace that power not being produced? (0001-3 [Byrd, William A.]

**Comment:** We [League of Women Voters of South Carolina] are concerned because South Carolina citizens' desires for new energy strategies are being ignored in favor of traditional toxic and polluting industries. (0009-1 [Rhodes, Suzanne])

**Comment:** I also see that we are at the -- we are kind of at the cusp of finding ways to create greater efficiency in grids, greater insulation, use of renewable energy. These technologies are being developed. And, hopefully, there will be more development into that. (0010-23 [Berg, Michael])

**Comment:** [The commenter expects to see the following addressed in NRC's environmental review:] Allowed connections to a new hydrogen production technology. Or limitations from the environmental point of view. (0044-23 [Wojcicki, Joe])

**Response:** *The EIS will be prepared in accordance with 10 CFR 51.75(c). Alternative energy sources, including renewable energy sources such as wind and solar power as well as energy conservation and efficiency programs, and the no action alternative, will be considered in Chapter 9 of the EIS. Energy conservation and energy efficiency will also be considered as part of the need for power analysis in Chapter 8 of the EIS.*

**Comment:** In the application, before the Public Service Commission, the analysis that SCE&G did of alternatives, efficiency, conservation, and renewable energy, was a mere matter of pages. There was hardly any analysis done of demand side management, as it is called, which is now sweeping the nation. In the Public Service Commission hearing, the company said they would do such an analysis of these alternatives, which costs far less than building a new nuclear plant, sometime later this year. But we don't have that analysis. The EIS should cover the analyses, including energy efficiency, conservation, and renewables, which conservation can be brought online at a cost of three to four cents, where there are indications that the nuclear power coming out of these new reactors could be 20 cents, 25 cents, 30 cents, per kilowatt hour. (0010-46 [Clements, Tom])

**Response:** *The NRC does not establish public policy regarding electric power supply alternatives nor does it promote the use of nuclear power as a preferred energy alternative. Decisions regarding which generation sources and alternatives to generation to deploy are made by the applicant through least-cost planning and integrated resource plans. Additional regulatory purview is provided by bodies such as State energy-planning agencies and commissions. However, the discussion of various alternatives to the proposed Units 2 and 3 is pertinent to the extent that an energy alternative must reasonably be expected to meet the need for power (including baseload power needs), whether individually or in combination. The alternatives must be technically viable, feasible, and competitive. Chapter 9 of the EIS will include the no-action alternative (energy efficiency and demand-side management as updated by the June 2009 proposed issuance of SCE&G DSM Programs), new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives, environmental impacts will be assessed against that of the proposed Units 2 and 3. If one of the potentially acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

**Comment:** I think that we can create jobs by investing in different sources of energy, and greater efficiency, insulation, renewables, and jobs that can be spread throughout the state. And

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jobs that, hopefully, would not cost the ratepayer the great amounts that SC&G wants to charge the ratepayer, much likely much more so. (0010-25 [Berg, Michael])

**Comment:** I mean, our rates are relatively low, but because our homes, especially our low income homes, are so inefficient, they are so leaky, even my own house is leaky, and I'm working on that now, these people have huge electric bills. Not because the (rates are high, but because we are so inefficient, and our houses are so leaky. We could probably negate the need for this plant, at all, if we would put serious consideration into doing weatherization, and energy efficiency, in making our houses energy efficiency. (0010-65 [Corbett, Susan])

**Comment:** Lastly I would just like to say, you know, we don't have to be on the lookout for new energy sources. We have them, we have a PhD professor from Clemson, Professor Nick Rigas, he did he did an incredible study of our offshore wind potential. He says that we have over 4,000 megawatts of offshore wind that could be up and running in five years. Half the time that it would take to build this reactor. (0010-75 [Corbett, Susan])

**Comment:** Let me just give the example of California or Nevada. They built one production solar panels for 100 million dollars. Each of them, they were built in one year. And each of this facility can build in ten years exactly two and a half gigawatts power that is right now planned by these two reactors. (0010-92 [Wojcicki, Joe])

**Comment:** One of the things you have heard tonight is a lot about renewables, and renewables are great, but one thing about our renewables, we would be using them right now, is that they are not sustainable. We have not reached that level yet, with solar cells, wind power, biomass, something that Santee Cooper is working on, is a biomass project with Newberry. And if it was so great, you know, we would be doing it right now. But it is not sustainable, we don't have the infrastructure, we don't have the time. We are taking baby steps. (0010-95 [Von Kaenel, Hoyt])

**Comment:** And if there are better, safer, faster, cheaper ways to do this, that don't leave a legacy of toxic radioactive waste for thousands of years, I think those should be the first things that we look at, not the last. (0011-122 [Corbett, Susan])

**Comment:** Others are here to champion alternative energy approaches. Certainly we should all be able to agree that we should use energy efficiently. We should conserve energy wisely. And we should use energy sources that may provide unique applications, such as solar panels for powering remote equipment. Unfortunately many of the folks who want to believe so strongly in the promise of these approaches, that they are convinced that we don't need additional baseload energy supply. Taken to an extreme of practicing efficiency and conservation as the only approaches to solving our energy woes, will lead to abject poverty for our citizens. This has been demonstrated in the rest of the world, where one-third of the population have no electricity, and they live in abject poverty. (0011-53 [Wolfe, Clint])



**Comment:** Another myth about these [green energy] technologies is that they are somehow cleaner. Cleaner than coal, maybe. Cleaner than nuclear? No way. If all of our energy were produced from nuclear power then all of the high level nuclear waste attributable to a single person, in his or her lifetime, could be contained in a single coke can, a 12 ounce coke can. Compare that to the mountains of coal ash and tons of carbon dioxide from burning coal. Solar panels are manufactured in processes involving extremely toxic materials. And when the panels are discarded they will have to be monitored, in regulated disposal sites, due to heavy metal content. Toxic metals, unlike radioactive waste, does not go away with time, rather remain toxic forever. (0011-56 [Wolfe, Clint])

**Comment:** The VCSNS would add an incremental amount to the employment and tax base of the Columbia economic area. The employment effects, however, depend on worker skills that may not be available locally. Any economic benefits of VCSNS would be more than offset by the substantial increase in electricity prices paid by consumers. Adoption of the alternatives of renewable energy sources and greater energy efficiency, rather than approval of the VCSNS, would have larger employment effects and would also result in lower long-term electricity prices. (0037-14 [Thomas, Ruth])

**Comment:** Finally, with the incredible costs associated with the project, financial as well as environmental, would it not be more prudent for SCE&G to commit this funding to alternative renewable energy sources? Solar and wind farms have the ability to provide needed electricity without the potential for catastrophe. What price should the citizens of western Fairfield County be required to pay for our state's increasing appetite for energy? Can we as a county, and a country, continue to consume resources with no concern as to how those resources are obtained? (0049-10 [Barnes, Jenifer])

**Response:** *The NRC does not establish public policy regarding electric power supply alternatives nor does it promote the use of nuclear power as a preferred energy alternative. Decisions regarding which generation sources and alternatives to generation to deploy are made by the applicant through least-cost planning and integrated resource plans. Additional regulatory purview is provided by bodies such as State energy-planning agencies and commissions. However, the discussion of various alternatives to the proposed Units 2 and 3 is pertinent to the extent that an energy alternative must reasonably be expected to replace the base load energy supplied by the proposed Units 2 and 3, whether individually or in combination. The alternatives must be technically viable, feasible, and competitive. Chapter 9 of the EIS will include the no-action alternative (such as energy efficiency and demand-side management; demand-side management is also captured in Chapter 8 as an energy supply contribution), new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives environmental impacts will be assessed against that of the proposed Units 2 and 3. If one of the potentially acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

**Comment:** You heard some discussion about life cycle of greenhouse gases. People would have you believe that nuclear plants do emit greenhouse gases, because if you mine uranium,

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or if you build the plants, and then you decommission the plants, that that process emits greenhouse gases.

And when you look at it on a per unit of energy basis, the life cycle of greenhouse gas emissions for nuclear are lower than that of solar, and about the same as that of wind. So, remember, it takes manufacturing to build solar panels, and it takes manufacturing to build wind turbines, also. (0010-100 [Byrne, Stephen])

**Response:** *The NRC does not establish or comment on public policy regarding electric power supply alternatives. The NRC does not promote the use of nuclear power as a preferred energy alternative. In addition, the NRC does not regulate alternatives to producing electricity that do not involve nuclear power. The NRC does evaluate energy alternatives, as part of its review under NEPA of applications for new nuclear power plants, and it regulates the nuclear industry to protect the public health and safety within existing policy. The discussion of alternative energy sources in Chapter 9 of the EIS will describe the potential impacts from alternative energy sources such as fossil-fired facilities, including estimated emissions of greenhouse gases, and will also include analysis of energy efficiency and renewable energy sources.*

**Comment:** And immediately, the thing cheapest that we electricity could do is, the electricity that you don't use. I have been recently doing some work on my house, because I know that I need to -- if I'm going to talk the talk, I need to walk the walk. So I have been sealing up my windows, I'm blowing new insulation in my attic, and changing out my light bulbs. I have been able to cut my kilowatt usage dramatically. If everybody did that, and if people got help, through incentives and programs, and subsidies, we could cut way back on the amount of electricity that we are using, and maybe negate the need for building these plants, or using alternatives to fill in. So energy efficiency is something that we just really have, it is underused. (0011-117 [Corbett, Susan])

**Comment:** I have a 12 year old house. I just had an energy rating done. The house was tight, I didn't have problems with air infiltration. But I had a duct that had slipped off of one of its boots. The study came back indicating that I'm spending 35 to 50 dollars a month more for energy that I'm not receiving. And this is typical of most houses today. As a matter of fact, when you look at where the problems are, and I work with energy raters, so I'm not talking off the top of my head, air infiltration is probably one of the more significant issues. And that is air leaking into your house. So when we talk about a window being open, that is literally true. Sometimes it may be more than that, you just don't know where it is, but it is happening all the time. The next thing that most people don't know about, is that their duct work is probably severed some place, other than their attic, or under their house. Part of the reason for this is that building practices, for the last 30 or 40 years, have used duct tape, instead of mastics, to seal your duct work together. Duct tape dries out, fittings fall apart, they leak, and bingo, 20 percent of the air, whether it is summertime conditioned air, or heat that you put into your house, and a lot of South Carolinians use heat pumps, so it is electrical demand, is going into heating the greater outdoors, not your house. And the final area is probably just inadequate attic insulation. Now, does anybody know this for a fact? No, because there have been very few studies done on it here in the state. We have

information from studies that have been done by our energy raters, that covers some 50 houses. We also know that building sciences are developing very quickly. It is very possible, today, to build a house that is 95 percent energy efficient. Houses that are being built today are anywhere from 30 to 50 percent more efficient than they were just in 2003. (0011-124 [Newton, Larry])

**Comment:** So the real question today is, with all the changes that are going on, rapidly, technological progress, what is going on in building sciences, the ability to retroactively, or retrofit older houses, both commercial and residential buildings, which probably are in great need here in South Carolina.

If you achieve a 15 percent efficiency improvement over the next, say, six or eight years and SCE&G is looking to basically cover a ten percent increase in demand. Now that is demand, not necessarily average electricity. Demand is when you get that spike in the summertime, when all of the air conditioners come on. If you manage the spike, if you do the efficiency, you might be surprised. Massachusetts and New York are committed to doing that right now. And a lot of other states are following suit. So the question is, why aren't we? (0011-127 [Newton, Larry])

**Comment:** The environmental report.....is severely lacking in the analysis of alternatives. I have looked at some of the sections, but on the consideration of energy efficiency, conservation, and renewable energy, there is almost nothing. It is a few pages. And the application to the Public Service Commission, is really about this much. And we all know that turning off a light is cheaper than building a new generation source to power that light bulb. We can see that energy efficiency and conservation may cost three cents, or so, a kilowatt hour. And building these new reactors could be anywhere from 15 to 30 cents per kilowatt hour. We need to look at the alternatives before we jump into a massively expensive project, and that has not been done, and the EIS should cover this. (0011-75 [Clements, Tom])

**Comment:** When I was coming in here tonight, there are 13 lights out there, in the parking lot, just burning away. I'm sure they will burn after we leave. And then you multiply that by all the other indulgences like that. I think they could get by with three. And then you see the lights, people have four street lights in their yard, out in the country now, night lights, I guess. I think the power companies should offer them switches to turn them off when the moon is full in the wintertime and high overhead. I mean, there are thousands of things that can be done to stop. We could cut our electricity down, I'm sure, 80 percent if we just would do it. (0011-97 [Mason, Corry])

**Comment:** We [League of Women Voters of SC] are concerned because South Carolina citizens' desires for new energy strategies are being ignored in favor of traditional toxic and polluting energy-generating industries. (0035-1 [Zia, Barbara])

**Comment:** [The EIS should consider] Alternatives to the proposed action. The major alternative to the proposed action is increased energy efficiency, conservation and demand side management (DSM) by the applicant utility. A review of the transcript of the hearings held in the South Carolina Public Service Commission (PSC) hearings on its consideration of the VCSNS (Docket 2008-196-E) provides considerable evidence that SCE&G could do much more to

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promote DSM. Hearings by PSC are to be held later in 2009 on DSM at SCE&G. Greater use of renewable technologies of wind and solar are also important alternatives. (0037-7 [Thomas, Ruth])

**Response:** *Chapter 8 of the EIS will include discussion of demand-side management and energy efficiency programs to the extent that they contribute to the need for power either as a supply-side resource, or as peak-limiting mechanisms. Chapter 9 of the EIS will include the no-action alternative (such as energy efficiency and demand-side management in lieu of a new plant), new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives, the potential for environmental impacts will be assessed against that of the proposed Units 2 and 3. If one of the acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

**Comment:** This project is good for the United States. It means less dependence on foreign oil. (0049-21 [Dennis, Dan])

**Response:** *This comment expresses an opinion about the proposed Units 2 and 3, but it does not provide information related to the environmental impacts of the new units. Therefore, it will not be considered further in the environmental review.*

**Comment:** And while we are paying on that interest, up front, we are not able to develop the infrastructure and the smart grid that the legislature is looking at now. They are finally waking up to the fact that the rest of the nation is working on smart grid, diversification, and not just diversification of resources, but change in the way the grid works, so that your power doesn't all have to come from a giant baseload, but from smaller plants. (0010-136 [Greenlaw, Pamela])

**Response:** *The NRC staff recognizes that when evaluating energy alternatives to the proposed Units 2 and 3, particularly for technologies that continue to be developed and commercially deployed, the evaluation must include relevant information representative of the current technology. However, the viability of various alternatives to the proposed Units 2 and 3 is pertinent to the discussion to the extent that the alternative must be capable of reasonably meeting the need for power (including baseload power needs). The alternatives must be technically viable, feasible, and competitive. Chapter 9 of the EIS will include alternative actions such as the no-action alternative (such as energy efficiency and demand-side management), new generation alternatives, purchased electrical power, alternative technologies (including renewable energy and distributed generation such as wind, solar, fuel cell, and biomass), and the combination of alternatives.*

**Comment:** This project is good for South Carolina. We need the energy, we can shut off all the lights we want to, we can button up every house, but thousands of people are moving to our state every year, from all over the country, and all over the world, they are moving to South Carolina. It is a great place to live. Those people need electricity. We can't get that electricity from shutting off lights, it doesn't work, the numbers don't add up. (0049-20 [Dennis, Dan])

**Response:** *This comment expresses an opinion about the proposed Units 2 and 3 as a baseload source of power in the service territory, but does not provide specific information related to environmental impacts of the proposed Units 2 and 3. Chapter 8 of the EIS will review the need for power including the impact of demand-side management and energy efficiency on the forecast load. Alternative energy sources will be evaluated in terms of the proposed Units 2 and 3 in Chapter 9 of the EIS.*

**Comment:** Fossil fuels, coal and natural gas are currently the only other means of generating large quantities of electricity all day long, day after day. The difference is the cost of generating electricity with nuclear fuel has decreased thirty percent over the past 10 years, while during that same time the cost of generating electricity with fossil fuels has risen substantially with no end in sight. Currently, the cost to produce 1,000 kilowatt hours of electricity (the approximate amount that an average customer uses in a month) using nuclear power is about \$75. Coal, natural gas, offshore wind and solar power would cost \$92, \$105, \$173 and \$656 respectively to produce the same amount. (0033-7 [Merrill, Denver])

**Response:** *The NRC does not establish or comment on public or private policy regarding electric power supply alternatives. The NRC does not promote the use of nuclear power as a preferred energy alternative. In addition, the NRC does not regulate alternatives to producing electricity that do not involve nuclear power. The NRC does evaluate energy alternatives, as part of its review under NEPA of applications for new nuclear power plants, and it regulates the nuclear industry to protect the public health and safety within existing policy. Chapter 9 of the EIS will include the no-action alternative (energy efficiency and demand-side management), new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives, the potential for environmental impacts will be assessed against that of the proposed Units 2 and 3. If one of the acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

**Comment:** Now, when you look forward to what is going to happen in the next ten years, with a very active administration in Washington, and you've seen it already, in terms of the EPA, and the actions they have taken, what they are looking to do with climate change, what they are doing in terms of weatherization, we are going to see a lot of changes coming very quickly here in South Carolina. If the stimulus package goes through, which had six billion dollars in it, to go ahead and weatherize two million low income homes, that averages about three thousand dollars a home. And this is the estimate that is being made to weatherize these houses effectively. If you look, right now, at SCE&G's cost for one and a half nuclear plants, that is about seven billion dollars in today's money. And I think that there is something like 600,000 residential customers. If you do the arithmetic, and we just talk about residences, we don't talk about helping anybody else, you are looking at 11,000 dollars a household you could spend on energy efficiency. (0011-125 [Newton, Larry])

**Comment:** Nuclear power produces more (reliable) energy than solar or wind. It would cost more to construct enough wind and solar sources than it would to create new nuclear power plants (preferably breeder reactors which would reduce if not eliminate the waste issues). When

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I started my degree for nuclear power, I sought to prove that solar and wind would be better. However, through my research, I discovered that it would cost thousands more to power a single neighborhood via solar and wind alone than the slight increase one may see with nuclear. (0026-2 [Sims, Raymond])

**Response:** *The NRC does not establish or comment on public or private policy regarding electric power supply alternatives, nor does it promote the use of nuclear power as a preferred energy alternative. Decisions regarding which generation sources and alternatives to generation to deploy are made by the applicant through least-cost planning and integrated resource plans. Additional regulatory purview is provided by bodies such as State energy-planning agencies and public utility commissions. However, the discussion of various alternatives to the proposed Units 2 and 3 is pertinent to the extent that an energy alternative must reasonably be expected to meet the need for power (including baseload power needs), whether individually or in combination. The alternatives must be technically viable, feasible, and competitive. Chapter 8 of the EIS will include review of the need for power in the service territory including the impacts of demand-side management and energy efficiency on the load forecasts. Chapter 9 will include the no-action alternative (energy efficiency and demand-side management), new generation alternatives, purchased electrical power, alternative energy technologies (including renewable energy such as wind and solar), and the combination of alternatives. For acceptable alternatives, the potential for environmental impacts will be assessed against that of the proposed Units 2 and 3. If one of the potentially acceptable alternatives is environmentally preferable to the proposed action, economic impacts will also be compared.*

### D.2.24 Comments Concerning Alternatives - Sites

**Comment:** They try, means South Carolina Electric and Gas, they want to build this here, close to us, in Jenkinsville. Now, practically, when you look at the load, this big load that is required 24 hours and 7 day's delivery, it is not going to be in the next 50 years here, around this area, it is going to be someplace between Charleston and Savannah river, Savannah port. There is a plan already signed by two governors, the governor of South Carolina, Mark Sanford, and the governor from Georgia, Mr. Perdue, to build an ocean terminal, which is pretty close to the Savannah port. And, really, this is going to be something that will require gigawatts of the power. (0010-82 [Wojcicki, Joe])

**Comment:** The problem is to deliver the power close to the Atlantic Ocean. And here is the problem. First, if we have to put these generators in proper place, as a product of electricity, it must be done closer to Charleston and Savannah, not here. (0010-84 [Wojcicki, Joe])

**Comment:** So let me turn back to the proposal of 90 moving these two units far away from Jenkinsville. Not far away, but somewhere in the Atlantic Ocean. First, we are going to have much better distribution of the electricity, we are going to have the right place to put this reactor. And we are going to get use of the seawater for cooling. (0010-89 [Wojcicki, Joe])

**Comment:** the location in the Jenkinsville is not good one. (0011-58 [Wojcicki, Joe])

**Comment:** And here is completely failure, because location of the Jenkinsville was finally approved in 2005. The study was done in 1970s. And right now, also, not only this was completely ignored what was going on 2024, and this is obligation of applicant to look into the future. (0011-59 [Wojcicki, Joe])

**Comment:** So putting here [Jenkinsville] units for two gigawatts, to transfer power from here over 200 miles to a place [Charleston], when this power we need, is completely nonsense. And this is because nothing was done in 2008 and '09. We have locations selected in 2005. So my proposal is to look at any location close to the Atlantic Ocean. Why? If we are going to have these units in Atlantic Ocean, first, the electricity will be close to the places they will be required to be. (0011-61 [Wojcicki, Joe])

**Comment:** It is not here, it should be close to the Atlantic. (0011-63 [Wojcicki, Joe])

**Comment:** Move these two guys to the place that really baseload is necessary, not here. (0011-68 [Wojcicki, Joe])

**Comment:** A misled PSC could not find a logical and efficient solution to this big project. For example, a statement of necessary additional transmission lines (SCE&G claim) when just a simple look at the SC map shows much smaller distances between any AOL [Atlantic Ocean Location] or JOT [Jasper Ocean Terminal] and Charleston (my version) location than between Jenkinsville via Charleston to JOT (SCE&G version of the site location). The truth is quite opposite than this claim in the Order. NRC must do this simple correction and request full map of existing network and its future topology in the SE of the USA. (0044-10 [Wojcicki, Joe])

**Comment:** Basic economic estimation must be always attached. Especially it is important in a new selection of the site. You should understand that the selection done in 2005 is no longer valid. (0044-19 [Wojcicki, Joe])

**Comment:** The Jenkinsville site location did not consider at least three aspects...Seawater would be a better cooling medium. (0044-3 [Wojcicki, Joe])

**Comment:** My proposed AOL [Atlantic Ocean Location] should save at least hundreds of millions of dollars in construction and even billions of dollars during the life of this project. (0044-7 [Wojcicki, Joe])

**Comment:**

- Requested and necessary scope of Basic Fundamental Electric Energy Generation and Distribution parts to be a replacement for already presented set of documents. With over 40 years of experience in this area, I [Joe Wojcicki] offer my help and expertise as an engineer and former SC educator.

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- A Site selection process must be redone. The interests of SC, the SE, and the USA must come before those of SCE&G.
- Mistakes that happened in the first stage of review of the Application must be avoided in the NRC final review and order. (0044-8 [Wojcicki, Joe])

**Response:** *NRC staff will review the alternative site-selection process to determine whether it is systematic, employs reasonable selection criteria, and constitutes an acceptable number of reasonable sites for consideration. The alternative sites will be compared against the proposed site to determine whether any of the alternative sites are environmentally preferable to the proposed site. The process and results will be provided in Chapter 9 of the EIS.*

### D.2.25 Comments Concerning Benefit-Cost Balance

**Comment:** And as these possibilities [renewable energy technologies] get cheaper, SC&G wants to commit the ratepayer in South Carolina to invest in a nuclear power plant, that once we go down the path, and we invest billions, after billions of dollars, cannot be reversed without just wasting the entire sum. (0010-24 [Berg, Michael])

**Comment:** While there may be some benefits here in the county, the people in the service area, and the rest of the county, could well be stuck with massive rate increases once we start paying for these things, which is going to be very soon, under South Carolina law. (0010-47 [Clements, Tom])

**Comment:** As far as cost, and this is getting back that efficiency and conservation are far cheaper. The company has partnered with Santee Cooper to build these plants and basically said they cost around ten billion dollars. The Department of Energy, on October 2nd, said that one reactor would cost nine billion dollars. And that may be at a site that doesn't have an existing reactor. There are other estimates that the two reactors could cost 20 billion dollars or more. So there is a wide discrepancy about how much these things are going to cost the ratepayers of South Carolina. There could end up being quite a negative economic impact due to building the reactors. (0010-49 [Clements, Tom])

**Comment:** And the thing that, you know, the utility passed this baseload review act, last year. This was an act in the past that used to protect people from what happened in the past. I'm holding up an NRC document. This is a document that they published about reactors around the country. This is five pages of canceled reactors that they started, and then they defaulted on. And I promise you that the ratepayers ended up paying for these. So, unfortunately, the Baseload Review Act that they got passed last year, is forcing us to pay up front for the financing, with no guarantee that it is ever going to get built. If they default we are not going to get any money back. So I have some big problems with that. I think it is an economic -- especially in this economic climate, this is a big risk. And I don't think that the ratepayers should be forced to take on that risk. We are taking on the risk, they are taking on the profit. (0011-118 [Corbett, Susan])



**Comment:** part of it is about the cost, and the impact on the rates to people in the service area. (0011-70 [Clements, Tom])

**Response:** *The purpose of the EIS is to disclose potential environmental impacts of constructing and operating the proposed Units 2 and 3. Neither the determination of the impact of constructing and operating a nuclear power plant on retail power rates, nor the impacts such potential rate changes may cause, is under NRC's regulatory purview, and therefore these comments will not be considered further.*

**Comment:** We remain convinced that apples to apples comparison of kilowatt hour costs at the buss bar, will favor nuclear generated electricity. Price fluctuations in steel, concrete, and other commodities, will affect the price of construction of any new generation capability, no matter what the technology. The largest component of potential unanticipated costs is time. (0010-110 [Wolfe, Clint])

**Comment:** SCE&G is understanding the true cost of the two reactors, understating the true cost of the two reactors, risking massive cost overruns. The DOE has estimated over nine billion each, not ten billion for two. (0010-119 [Cooper, Elaine])

**Comment:** I ask that you fully consider the costs of this proposed project. That is the cost of building two AP1000 plants. And I submit to you, as others have said tonight, that the company has grossly underestimated the cost of the plant, and there is substantial extrinsic evidence supporting that that plant cost is underestimated. (0010-128 [Guild, Robert])

**Comment:** And it costs more to build one, get all the ores out of the ground, process it, build it, burn the lights 24/7, take the stars out of the night, building these things for years and years, and then as it produces, they run in the red. (0010-155 [Mason, Corry])

**Comment:** And it comes, I mean, when you consider construction costs, the material input, the concrete and steel, it is five times more for a windmill, on a per kilowatt hour basis. Again, it is important to factor in the overall life cycle cost. And this is based on a 2005 International Journal of Life Cycle journal article, as well as a 2000 Renewable Energy Journal article. (0010-179 [Knight, Travis])

**Comment:** I think that this utility has severely underestimated the cost of this plant, based on what we are seeing world-wide. And they have also underestimated the kilowatt hour. I think they ran an ad in the state paper saying that it is going to be 7 cents a kilowatt hour. I think they are underestimating that. (0010-76 [Corbett, Susan])

**Comment:** And, especially, in this coming depression, so we are concerned about the economics of this plant. We feel like the cost is being understated, the kilowatt hour has been understated, and they won't guarantee a cost, so you really don't know what your final cost is going to be. You are kind of paying up front for a product that you are not sure, ultimately, what it is going to cost, or how much it is going to cost you in the end. They said in the State paper that they were going to be able to produce this thing, produce it for 9 cents a kilowatt hour. Well,

## Appendix D

there are national groups that are professional assessment investment groups that are saying now that nuclear is going to cost between 15 and 20 cents a kilowatt hour. So somewhere these figures just don't make sense. (0011-115 [Corbett, Susan])

**Comment:** So with respect to this plan, some of the things for all of us in this room to consider, the incredible construction costs, there is just a real wide discrepancy between what SCE&G and Santee Cooper estimate as the cost, and what independent agencies have said that the cost will be. (0011-18 [Ramsburgh, John])

**Comment:** A third are the incredible costs that are associated with plants that don't go into just the construction cost, the health care cost, the transportation cost, the transport of waste cost, the impacts on the roads, on our potholes, on our city streets. (0011-20 [Ramsburgh, John])

**Comment:** one of them [two new units] is going to be private. And I read up on nukes over the years, here and there, and one of the things that I have come to understand is that there is a lot of hidden costs to build them. You take the ore out of the ground, process it, like an automobile. They say they do most of the pollution by creating them. (0011-94 [Mason, Corry])

**Comment:** The National Environmental Policy Act (NEPA) requires as part of the EIS a detailed statement of alternatives to the proposed action. In the comparison of nuclear generation of electricity with alternatives such as coal, natural gas, wind or solar, there is a tendency to understate the economic costs of nuclear generation. (0040-3 [Thomas, Ruth] [Wilder, Ronald])

**Comment:** The risk of nuclear accidents and the routine radioactive contamination by operating reactors means that much of the costs of the nuclear option are imposed on citizens, including many who do not receive benefits as electricity customers. In comparing the nuclear option with renewable resources, this difference in external costs of nuclear versus renewable energy sources should be quantified in the EIS when the comparison of alternatives is made. (0040-5 [Thomas, Ruth] [Wilder, Ronald])

**Comment:** The reported accounting costs of the nuclear option are understated for the above reasons. For the EIS to be valid, it should quantify the dollar value of all the external costs, including risk of accidents and environmental damage. The EIS should also place a dollar value on all of the subsidies received by nuclear power when nuclear is compared with other, less subsidized options. I urge the NRC to draft an EIS that is independent, fair, and that carefully considers the issue of external costs and subsidies. (0040-6 [Thomas, Ruth] [Wilder, Ronald])

**Response:** *The disclosure of the costs of the proposed action will rely on the best available estimate of financial costs with uncertainties noted. Associated costs that cannot be reliably quantified also will be discussed. Chapter 10 of the EIS will address the estimated overall internal and external benefits, costs, and associated environmental impacts of the proposed project.*

**Comment:** Nuclear generation of electricity has, and continues to be, subsidized by the federal government. Subsidies include the insurance benefits of the Price-Anderson Act, which provides liability insurance beyond that available in the commercial market. As a result, taxpayers shoulder nearly all of the risk of a major nuclear accident, and the accounting costs of electric utilities understate total costs. Those utilities using nuclear generation of electricity recognize that there is a very high liability risk in the event of a Chernobyl-type accident, and they would be unlikely to build reactors if the Price-Anderson subsidy were not available. Another major subsidy is the loan guarantee program for new reactors included in the Energy Policy Act of 2005, as well as research and development programs included in that Act. (0040-4 [Thomas, Ruth] [Wilder, Ronald])

**Response:** *The NRC is not involved in establishing national energy policy, and issues related to the subsidization of nuclear power are outside the scope of the NRC's mission and authority.*



## **Appendix E**

### **Draft Environmental Impact Statement Comments and Responses**



## Appendix E

### Draft Environmental Impact Statement Comments and Responses

This environmental impact statement (EIS) has been prepared in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by South Carolina Electric & Gas (SCE&G), acting for itself and for Santee Cooper (formally called the South Carolina Public Service Authority), for combined construction permits and operating licenses (combined licenses or COLs) for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, to be located in Fairfield County, South Carolina. There is an existing unit on the VCSNS site; the proposed Units 2 and 3 would be located approximately 1 mi south of VCSNS Unit 1. SCE&G also submitted a joint Federal/State Application for a Department of the Army (DA) Individual Permit to the U.S. Army Corps of Engineers (USACE). The proposed actions related to the Units 2 and 3 application are (1) NRC issuance of COLs for the construction and operation of two new nuclear power generating units at the VCSNS site, and (2) USACE permit action on a DA Individual Permit application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The USACE participated collaboratively with the NRC on the environmental review of the applications; this EIS includes the NRC and USACE (together referred to as the “review team”) analysis that considers and weighs the environmental impacts of constructing and operating one or more new nuclear units at the VCSNS site or at alternative sites, and mitigation measures available for reducing or avoiding adverse impacts.

As part of the application review, the review team solicited comments from the public on a draft of this EIS. A 75-day comment period began on April 26, 2010, when the U.S. Environmental Protection Agency (EPA) issued a Notice of Availability (75 FR 21625) of the draft EIS to allow members of the public to comment on the results of the environmental review. On May 25, 2010, two public meetings were held at the White Hall African Methodist Episcopal (AME) Church in Jenkinsville, South Carolina. At the meeting, NRC and USACE staff described the results of the environmental review, answered questions related to the review, and provided members of the public with information to assist them in formulating their comments.

As part of the process to solicit public comments on the draft EIS, the review team

- placed a copy of the draft EIS at the Fairfield County Library in Winnsboro, South Carolina
- made the draft EIS available in the NRC’s Public Document Room in Rockville, Maryland
- placed a copy of the draft EIS on the NRC website at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1939/>

## Appendix E

- provided a copy of the draft EIS to any member of the public that requested one
- sent copies of the draft EIS to certain Federal, State, and local agencies
- published a notice of availability of the draft EIS in the *Federal Register* on April 23, 2010 (75 FR 21368)
- filed the draft EIS with the EPA
- announced and held two public meetings at the White Hall AME Church in Jenkinsville, South Carolina to describe the results of the environmental review, answer any related questions, and take public comments.

Approximately 85 people attended the meetings and 13 attendees provided oral comments. A certified court reporter recorded the oral comments and prepared written transcripts of the meeting. The transcripts of the public meeting(s) are part of the public record for the proposed project and were used to establish correspondence between comments contained in this volume of the EIS to oral comments received at the public meetings. In addition to the comments received at the public meetings, the NRC received 19 letters and e-mail messages with comments. The comment period closed on July 9, 2010; however, the NRC did, to the degree permitted by the schedule, consider comments submitted after the comment period ended.

A meeting summary is available from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS); its accession number is ML101610800. The transcripts of the public meetings, and the letters and e-mail messages providing comments on the draft EIS are also available in ADAMS; accession numbers are provided in Table E-1. ADAMS is accessible at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html), which provides access through the NRC's Public Electronic Reading Room link. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's Public Document Room reference staff at 1-800-397-4209 or 301-415-4737, or by e-mail at [pdr@nrc.gov](mailto:pdr@nrc.gov).

### **E.1 Disposition of Comments**

This appendix contains all of the comments extracted from the comment letters and e-mail messages, provided to the review team during the comment period as well as the comments from the transcripts. Each set of comments from a given commenter was given a unique alpha identifier (commenter ID), allowing each set of comments from a commenter to be traced back to the transcript, letter, or e-mail in which the comments were submitted.

After the comment period, the review team considered and dispositioned all comments received. To identify each individual comment, the team reviewed the transcript of the public meeting and each letter and e-mail received related to the draft EIS. Table E-1 lists



commenters identified by name, affiliation (if given), comment number, and the source of the comment including its ADAMS accession number. As part of the review, the review team identified statements that they believed were related to the proposed action and recorded the statements as comments. Each comment was assigned to a specific subject area, and similar comments were grouped together. Finally, responses were prepared for each comment or group of comments.

This appendix presents the comments and the review team responses to them grouped by similar issues as presented in Table E-1.

**Table E-1.** Comment Categories in Order of Presentation

<b>Section</b>	<b>Comment Category</b>	<b>Page</b>
E.2.1	Process – COL	E-10
E.2.2	Process – NEPA	E-10
E.2.3	Site Layout and Design	E-13
E.2.4	Land Use – Transmission Lines	E-15
E.2.5	Hydrology – Surface Water	E-17
E.2.6	Hydrology – Groundwater	E-25
E.2.7	Ecology – Terrestrial	E-25
E.2.8	Ecology – Aquatic	E-30
E.2.9	Socioeconomics	E-41
E.2.10	Environmental Justice	E-44
E.2.11	Historic and Cultural Resources	E-47
E.2.12	Meteorology and Air Quality	E-49
E.2.13	Health – Nonradiological	E-56
E.2.14	Health – Radiological	E-56
E.2.15	Nonradioactive Waste	E-59
E.2.16	Accidents – Severe	E-59
E.2.17	Uranium Fuel Cycle	E-60
E.2.18	Transportation	E-62
E.2.19	Decommissioning	E-63
E.2.20	Cumulative Impacts	E-63
E.2.21	Need for Power	E-63
E.2.22	Alternatives – Energy	E-68
E.2.23	Alternatives – System Design	E-72
E.2.24	Alternatives – Sites	E-73
E.2.25	Benefit-Cost Balance	E-75
E.2.26	General Comments in Support of the Licensing Process	E-77
E.2.27	General Comments in Support of the Existing Plant	E-78
E.2.28	General Comments in Opposition to the Licensing Action	E-79

**Table E-1.** (contd)

<b>Section</b>	<b>Comment Category</b>	<b>Page</b>
E.2.29	General Comments in Opposition to the Licensing Process	E-80
E.2.30	Issues Outside Scope – Emergency Preparedness	E-81
E.2.31	Issues Outside Scope – Miscellaneous	E-81
E.2.32	Issues Outside Scope – NRC Oversight	E-83
E.2.33	Issues Outside Scope – Safety	E-84
E.2.34	Issues Outside Scope – Security and Terrorism	E-85
E.2.35	General Editorial Comments	E-86

When the comments resulted in a change in the text of the draft EIS, the corresponding response refers the reader to the appropriate section of the EIS where the change was made. Throughout the final EIS, with the exception of this new Appendix E, revisions to the text from the draft EIS are indicated by vertical lines (change bars) in the margin beside the text.

Table E-2 provides a list of commenters identified by name, affiliation (if given), comment number, and the source of the comment. Some comments addressed topics and issues that are not part of the environmental review for this proposed action. These comments included questions about the NRC's safety review, general statements of support or opposition to nuclear power, observations regarding national nuclear waste management policies, comments on the NRC regulatory process in general, and comments on NRC regulations. These comments are included, but detailed responses to such comments are not provided because they addressed issues that do not directly relate to the environmental effects of this proposed action and are thus outside the scope of the National Environmental Policy Act (NEPA) review of this proposed action. If appropriate, these comments were forwarded to the appropriate organization within the NRC for consideration.

Many comments specifically addressed the scope of the environmental review, analyses, and issues contained in the draft EIS, including comments about potential impacts, proposed mitigation, the agency review process, and the public comment period. Detailed responses to each of these comments are provided in this appendix.

## **E.2 Comments and Responses**

Table E-3 is an alphabetical index to the comment categories and lists the commenter names and comment identification numbers that were included in each category. The balance of this document presents the comments and responses organized by topic category. References appear in Section E.3 at the end of the appendix.

**Table E-2.** Individuals Providing Comments During the Comment Period

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession #</b>	<b>Correspondence ID</b>
Anderson, Russell		Meeting Transcript (ML101610796)	0002
Archie, Jeff	VC Summer Nuclear Station Unit 1	Meeting Transcript (ML101610797)	0003
Archie, Jeff	VC Summer Nuclear Station Unit 1	Meeting Transcript (ML101610798)	0004
Barczak, Sara	Southern Alliance for Clean Energy	Letter (ML101900257)	0017
Byrd, Verna		Letter (ML101870020)	0014
Byrd, Verna		Letter (ML101870021)	0013
Clary, Ronald	SCE&G	Letter (ML101900618)	0016
Clements, Tom	Friends of the Earth	Meeting Transcript Attachment (ML101610798)	0011
Clements, Tom	Friends of the Earth	Meeting Transcript (ML101610798)	0004
Corbett, Susan	Chair, South Carolina Sierra Club	Meeting Transcript (ML101610798)	0004
Croom, Miles	NOAA	Letter (ML102070376)	0021
Dobrasko, Rebekah	SC Dept. of Archives and History	Letter (ML101540528)	0001
Gay, Christopher		Letter (ML101760034)	0008
Gay, Karen		Letter (ML101760036)	0010
Gay, Roberta		Letter (ML101760035)	0009
Hancock, Mandy	Southern Alliance for Clean Energy	Letter (ML101900257)	0017
Hancock, Mandy	Southern Alliance for Clean Energy	Meeting Transcript (ML101610797)	0003
Herrington, Jay	U.S. Fish and Wildlife Service	Letter (ML102160401)	0022
Hildebrandt, Lorena		Meeting Transcript (ML101610797)	0003
Hocking, Steve	FERC	Letter (ML101830256)	0012
Hogue, Gregory	U.S. Department of the Interior	Letter (ML101900261)	0015
Hope, Ron		Meeting Transcript (ML101610798)	0004
Jocoy, Gregg	South Carolina Green Party	Meeting Transcript Attachment (ML101610798)	0007
Jocoy, Gregg	South Carolina Green Party	Meeting Transcript (ML101610798)	0004

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**Table E-2.** (contd)

<b>Commenter</b>	<b>Affiliation (if stated)</b>	<b>Comment Source and ADAMS Accession #</b>	<b>Correspondence ID</b>
Marcharia, Kamau	Fairfield County Council	Meeting Transcript (ML101610796)	0002
Martin, John		Meeting Transcript (ML101610796)	0002
Martin, John		Meeting Transcript (ML101610797)	0003
Martin, Michael		Letter (ML101750038)	0006
Mueller, Heinz	U.S. Environmental Protection Agency	Letter (ML102160720)	0023
Perry, Robert D.	SC Dept. of Natural Resources	Letter (ML101900253)	0020
Schaffer, Jeff		Meeting Transcript (ML101610796)	0002
Wojcicki, Joe		Email (ML101900262, ML101900540) Letter (ML101960465)	0018
Wojcicki, Joe		Meeting Transcript Attachment (ML101610798)	0005
Wojcicki, Joe		Meeting Transcript (ML101610798)	0004

**Table E-3.** Comment Categories

<b>Comment Category</b>	<b>Commenter (Comment ID)</b>
Accidents-Severe	<ul style="list-style-type: none"> <li>• Corbett, Susan (0004-1) (0004-5) (0004-7)</li> <li>• Mueller, Heinz (0023-6)</li> </ul>
Alternatives-Energy	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-4) (0017-8)</li> <li>• Clements, Tom (0004-44)</li> <li>• Hancock, Mandy (0003-3) (0003-4) (0003-5) (0017-4) (0017-8)</li> <li>• Hildebrandt, Lorena (0003-17)</li> </ul>
Alternatives-Sites	<ul style="list-style-type: none"> <li>• Wojcicki, Joe (0004-31) (0004-34) (0004-37) (0005-1) (0005-4) (0005-5) (0005-6) (0018-1) (0018-9) (0018-11)</li> </ul>
Alternatives-System Design	<ul style="list-style-type: none"> <li>• Martin, John (0002-1) (0003-23)</li> <li>• Perry, Robert D. (0020-14)</li> </ul>
Benefit-Cost Balance	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-1) (0017-6)</li> <li>• Clements, Tom (0004-43)</li> <li>• Hancock, Mandy (0003-1) (0003-7) (0017-1) (0017-6)</li> <li>• Jocoy, Gregg (0004-11)</li> <li>• Wojcicki, Joe (0004-35) (0004-38) (0018-7)</li> </ul>
Cumulative Impacts	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-31) (0016-32)</li> </ul>
Decommissioning	<ul style="list-style-type: none"> <li>• Byrd, Verna (0014-5)</li> </ul>

Table E-3. (contd)

Comment Category	Commenter (Comment ID)
Ecology-Aquatic	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-7) (0016-8) (0016-9) (0016-10) (0016-40) (0016-48) (0016-50) (0016-52) (0016-60)</li> <li>• Croom, Miles (0021-1) (0021-2) (0021-3) (0021-4) (0021-5) (0021-6) (0021-9)</li> <li>• Mueller, Heinz (0023-17) (0023-18) (0023-19) (0023-20)</li> <li>• Perry, Robert D. (0020-4) (0020-5) (0020-6) (0020-7) (0020-8) (0020-12) (0020-13) (0020-18) (0020-19) (0020-20) (0020-21)</li> </ul>
Ecology-Terrestrial	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-4) (0016-6) (0016-37) (0016-38) (0016-39) (0016-45) (0016-46) (0016-47) (0016-49) (0016-59)</li> <li>• Herrington, Jay (0022-1)</li> <li>• Mueller, Heinz (0023-2) (0023-11) (0023-21)</li> <li>• Perry, Robert D. (0020-1) (0020-2) (0020-3) (0020-9) (0020-16) (0020-17)</li> </ul>
Editorial Comments	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-1) (0016-5) (0016-11) (0016-13) (0016-15) (0016-18) (0016-22) (0016-26) (0016-28) (0016-30) (0016-33)</li> </ul>
Environmental Justice	<ul style="list-style-type: none"> <li>• Byrd, Verna (0013-4) (0014-2)</li> <li>• Gay, Karen (0010-1)</li> <li>• Mueller, Heinz (0023-23) (0023-24) (0023-25) (0023-27) (0023-29)</li> </ul>
Health-Nonradiological	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-17) (0016-51)</li> </ul>
Health-Radiological	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-10)</li> <li>• Byrd, Verna (0013-2) (0013-3)</li> <li>• Clary, Ronald (0016-27)</li> <li>• Clements, Tom (0004-46)</li> <li>• Corbett, Susan (0004-6)</li> <li>• Hancock, Mandy (0003-12) (0017-10)</li> <li>• Jocoy, Gregg (0004-18)</li> <li>• Mueller, Heinz (0023-16)</li> </ul>
Historic and Cultural Resources	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-41) (0016-61) (0016-63)</li> <li>• Dobrasko, Rebekah (0001-1) (0001-2)</li> <li>• Mueller, Heinz (0023-22)</li> </ul>
Hydrology-Groundwater	<ul style="list-style-type: none"> <li>• Mueller, Heinz (0023-1) (0023-15)</li> </ul>

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**Table E-3. (contd)**

Comment Category	Commenter (Comment ID)
Hydrology-Surface Water	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-7) (0017-9)</li> <li>• Clary, Ronald (0016-2) (0016-3) (0016-20) (0016-21) (0016-29)</li> <li>• Clements, Tom (0004-45)</li> <li>• Croom, Miles (0021-7)</li> <li>• Hancock, Mandy (0003-8) (0003-9) (0003-10) (0003-11) (0017-7) (0017-9)</li> <li>• Jocoy, Gregg (0004-21)</li> <li>• Marcharia, Kamau (0002-8)</li> <li>• Mueller, Heinz (0023-12) (0023-13) (0023-14)</li> <li>• Perry, Robert D. (0020-10) (0020-11) (0020-15)</li> <li>• Wojcicki, Joe (0004-32) (0004-33) (0005-2) (0005-3) (0018-6) (0018-8)</li> </ul>
Land Use-Transmission Lines	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-35) (0016-36) (0016-44) (0016-62)</li> <li>• Hope, Ron (0004-23) (0004-24)</li> </ul>
Meteorology and Air Quality	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-16) (0016-34)</li> <li>• Mueller, Heinz (0023-7) (0023-8) (0023-9) (0023-10) (0023-30) (0023-31)</li> </ul>
Need for Power	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-5)</li> <li>• Clary, Ronald (0016-53) (0016-54) (0016-55) (0016-56) (0016-57) (0016-58)</li> <li>• Hancock, Mandy (0003-6) (0017-5)</li> <li>• Hope, Ron (0004-25)</li> <li>• Jocoy, Gregg (0004-14) (0004-19) (0007-1)</li> <li>• Wojcicki, Joe (0018-4)</li> </ul>
Nonradioactive Waste	<ul style="list-style-type: none"> <li>• Mueller, Heinz (0023-4)</li> </ul>
Opposition-Licensing Action	<ul style="list-style-type: none"> <li>• Byrd, Verna (0013-1) (0014-1)</li> <li>• Clements, Tom (0004-48)</li> <li>• Gay, Christopher (0008-1)</li> <li>• Gay, Roberta (0009-2)</li> <li>• Jocoy, Gregg (0004-22) (0007-2)</li> <li>• Martin, Michael (0006-1)</li> <li>• Wojcicki, Joe (0004-36)</li> </ul>
Opposition-Licensing Process	<ul style="list-style-type: none"> <li>• Jocoy, Gregg (0004-8) (0004-10)</li> </ul>
Outside Scope-Emergency Preparedness	<ul style="list-style-type: none"> <li>• Jocoy, Gregg (0004-17)</li> <li>• Marcharia, Kamau (0002-3) (0002-7)</li> </ul>
Outside Scope-Miscellaneous	<ul style="list-style-type: none"> <li>• Archie, Jeff (0003-21) (0004-29)</li> <li>• Byrd, Verna (0014-4)</li> <li>• Jocoy, Gregg (0004-12)</li> <li>• Wojcicki, Joe (0004-40) (0018-12)</li> </ul>
Outside Scope-NRC Oversight	<ul style="list-style-type: none"> <li>• Jocoy, Gregg (0004-9)</li> <li>• Wojcicki, Joe (0018-10)</li> </ul>

Table E-3. (contd)

Comment Category	Commenter (Comment ID)
Outside Scope-Safety	<ul style="list-style-type: none"> <li>• Byrd, Verna (0013-5) (0013-7) (0014-3)</li> <li>• Gay, Roberta (0009-1)</li> <li>• Marcharia, Kamau (0002-9)</li> </ul>
Outside Scope-Security and Terrorism	<ul style="list-style-type: none"> <li>• Anderson, Russell (0002-17)</li> <li>• Byrd, Verna (0013-6)</li> </ul>
Process-COL	<ul style="list-style-type: none"> <li>• Jocoy, Gregg (0004-13)</li> <li>• Wojcicki, Joe (0018-2) (0018-3)</li> </ul>
Process-NEPA	<ul style="list-style-type: none"> <li>• Barczak, Sara (0017-3)</li> <li>• Clements, Tom (0004-47)</li> <li>• Croom, Miles (0021-8)</li> <li>• Hancock, Mandy (0003-13) (0017-3)</li> <li>• Hildebrandt, Lorena (0003-14) (0003-16)</li> <li>• Hocking, Steve (0012-1)</li> <li>• Hogue, Gregory (0015-1)</li> <li>• Jocoy, Gregg (0004-16) (0004-20)</li> <li>• Mueller, Heinz (0023-3)</li> <li>• Wojcicki, Joe (0004-39) (0005-7)</li> </ul>
Site Layout and Design	<ul style="list-style-type: none"> <li>• Anderson, Russell (0002-13)</li> <li>• Barczak, Sara (0017-2)</li> <li>• Clary, Ronald (0016-19) (0016-42) (0016-43)</li> <li>• Clements, Tom (0004-42)</li> <li>• Hancock, Mandy (0003-2) (0017-2)</li> <li>• Wojcicki, Joe (0018-5)</li> </ul>
Socioeconomics	<ul style="list-style-type: none"> <li>• Clary, Ronald (0016-12) (0016-14) (0016-23) (0016-24) (0016-25)</li> <li>• Jocoy, Gregg (0004-15)</li> <li>• Marcharia, Kamau (0002-4) (0002-5) (0002-6) (0002-10) (0002-11) (0002-12)</li> <li>• Mueller, Heinz (0023-26) (0023-28)</li> <li>• Schaffer, Jeff (0002-2)</li> </ul>
Support-Licensing Process	<ul style="list-style-type: none"> <li>• Archie, Jeff (0003-18) (0004-26)</li> </ul>
Support-Plant	<ul style="list-style-type: none"> <li>• Archie, Jeff (0003-19) (0003-20) (0003-22) (0004-27) (0004-28) (0004-30)</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• Anderson, Russell (0002-16)</li> </ul>
Uranium Fuel Cycle	<ul style="list-style-type: none"> <li>• Anderson, Russell (0002-14) (0002-15)</li> <li>• Clements, Tom (0004-41) (0004-49) (0004-50) (0011-1)</li> <li>• Corbett, Susan (0004-2) (0004-3) (0004-4)</li> <li>• Hildebrandt, Lorena (0003-15)</li> <li>• Mueller, Heinz (0023-5)</li> </ul>

### E.2.1 Comments Concerning Process – COL

**Comment:** During the display, here [at the public meeting], we had a lovely photograph of what I assume was the Nuclear Regulatory Commission office in the photograph under U.S. Nuclear Regulatory Commission. This is not a pretty, neat, clean business that these folks are involved in. They make it sound like it is all scientific, and we can trust these plans because they have been reviewed by 14 people who all have PhDs, and so on like that. Well, I frankly don't trust them, and I don't think that you all should trust them, either. (0004-13 [Jocoy, Gregg])

**Comment:** NRC verification seems to be a blind support of the application. (0018-3 [Wojcicki, Joe])

**Response:** *These comments did not provide new information related to the environmental effects of the proposed action. Therefore, no changes were made to the EIS.*

**Comment:** If verifiers could not find such wrong / misleading calculation about available water from Broad River, why NRC rejected unlawfully (against simple facts) Joseph Wojcicki's petition to intervene who found this mistake in 2008? (0018-2 [Wojcicki, Joe])

**Response:** *Mr. Wojcicki's petition to intervene was addressed in "NRC Staff Answer to 'Petition to Intervene' from Joseph Wojcicki," filed on January 2, 2009 on Docket Nos. 52-027 and 52-028 and is outside the scope of the environmental review. No changes were made to the EIS as a result of this comment.*

### E.2.2 Comments Concerning Process – NEPA

**Comment:** Fundamentally, we believe the Draft EIS has not fully addressed the full environmental impact and public health impacts of the V.C. Summer proposal, or the possibility of pursuing a combination of alternative energy options. With billions of rate payer and, likely, tax payer dollars going towards this project, it is frustrating that a full and comprehensive analysis of how this proposal will impact South Carolinians and their surrounding natural environs has not been the outcome of this draft EIS. (0003-13 [Hancock, Mandy])

**Comment:** This scenario [risks of wading a river vs. bridge alternative] from Mary O'Brian, published by MIT, illustrates the problem with the risk assessment paradigm that does not truly allow for alternatives. I came today to speak on the necessity of true alternatives. O'Brian's argument functions on several principles, which I find useful in the overview of the Environmental Impact Statement for the two new V.C. Summer reactors. These principles are, one, that it is not acceptable to harm people when there are reasonable alternatives; two, it is not acceptable to harm nonhumans when there are reasonable alternatives; and, three, nobody is able to define for someone else what damage is acceptable, small, moderate or large. I do



not believe that alternatives were adequately addressed in this Environmental Impact Statement. (0003-14 [Hildebrandt, Lorena])

**Comment:** We need to move from an environmental impact and risk assessment paradigm that does not have the best health of the environment, and the communities, in mind. And allows for no true alternatives. (0003-16 [Hildebrandt, Lorena])

**Comment:** The fuel cycle in decommissioning comments, absolutely boilerplate, completely useless. We have looked at that, we know that it is fine. We have just incorporated what we already knew into this project. (0004-16 [Jocoy, Gregg])

**Comment:** This thing is being built because there are huge federal subsidies, tax dollars, going to major corporations. And it is nothing more than a payback for political contributions and political influence. (0004-20 [Jocoy, Gregg])

**Comment:** I ask the president of NRC to seriously correct the Environmental Impact Statement. I am an electrical engineer, I was teaching hydraulics and found errors (authority's error in South Carolina Electric and Gas application) that may cause terrible mistake, and bring shame to their dysfunctional team and management. Do not go away and be an embarrassment all over the world. (0004-39 [Wojcicki, Joe])

**Comment:** If you look at this large document, on page 9-197, basically all the impacts are listed as small. There are a couple of moderate ones as we saw on the slides. The NRC's analysis, in my opinion, is very poor. This is one of the less professional EISs that I have ever seen. (0004-47 [Clements, Tom])

**Comment:** I ask representatives of NRC to seriously correct their Environmental Impact Statement. I am electric engineer, I was teaching hydraulics and found errors, misleading authorities' errors in SCE&G application that may cause terrible mistake. (0005-7 [Wojcicki, Joe])

**Comment:** These many risks [to ratepayers, taxpayers, and the environment] are not adequately addressed in the Draft Environmental Impact Statement (DEIS). (0017-3 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The review team conducted its environmental review and prepared this EIS in accordance with the requirements of the National Environmental Policy Act (NEPA), Title 10 of the U.S. Code of Federal Regulations (CFR) Part 52, and 10 CFR Part 51. The review was based on information presented in the COL application Environmental Report (ER) submitted by the applicant and information obtained from independent sources. The review team used the SMALL, MODERATE, and LARGE impact category levels after completing its analyses to communicate the results of its assessment of the environmental impacts of the proposed action and alternatives to the action. The structure for the impact category levels was based on*

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*Council on Environmental Quality (CEQ) guidance (40 CFR 1508.27) and on discussions with the CEQ and the U.S. Environmental Protection Agency (EPA) when it was first implemented for licensing actions. Definitions of the three impact category levels are provided in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, and are provided in Section 1.1.1.1 of the EIS. No changes were made to the EIS as a result of these comments.*

**Comment:** Thank you for the opportunity to review the Draft Environmental Impact Statement for the Virgil C. Summer Nuclear Station Units 2 and 3, prepared as part of your review of South Carolina Electric and Gas Company's combined license application for the station. We [Federal Energy Regulatory Commission, FERC] have no comments at this time.

(0012-1 [Hocking, Steve])

**Response:** *This comment states that the Federal Energy Regulatory Commission (FERC) has no comments on the EIS. No change was made to the EIS as a result of this comment.*

**Comment:** The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement for the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3. We have no comments at this time. (0015-1 [Hogue, Gregory])

**Response:** *This comment states that the Department of the Interior has no comments on the EIS. No change to the EIS was made as a result of this comment.*

**Comment:** NRC initiated consultation with NMFS PRD by letter dated April 15, 2010. Consultation for this project is required to ensure that the project's effects are not likely to jeopardize the continued existence of the endangered shortnose sturgeon. NMFS PRD plans to coordinate completion of ESA consultation with the NRC and the COE upon their review of NMFS comments and concerns and issuance of the Final EIS. (0021-8 [Croom, Miles])

**Response:** *As indicated in the comment, the NRC has initiated consultation with the National Marine Fisheries Service (NMFS). Correspondence related to the consultation is in Appendix F of this EIS. The NRC plans to complete consultation with the NMFS prior to issuance of the COL.*

**Comment:** The supporting infrastructure at the site includes additional new facilities: roads, railroad lines, and buildings. New buildings associated with proposed Units 2 and 3 include the water-treatment plant, sanitary waste treatment plant, and power transmission system. Diesel generators would be installed as a backup power source. This construction should be considered part of the project, and the impacts of these actions are direct project impacts.

We reviewed the listing of permits required for the project in Appendix H, and note that no permits have been issued under the NRC's Limited Work Authorization (LWA) permitting process at this time. The DEIS (Volume 1, page 1-5) states that..."Activities associated with

*building the plant that are not within the purview of the NRC action are grouped under the term 'preconstruction'," and Appendix H describes LWA permitted activities as "safety-related construction activities."*

We note that transmission lines are listed in the example of preconstruction activities in the DEIS (Volume 1, page 1-5), which also states that preconstruction activities are considered in the context of cumulative impacts. EPA is concerned about the impacts of transmission lines and supporting infrastructure for the project and, in accordance with NEPA, considers these activities as part of the project, and not a separate action.

(0023-3 [Mueller, Heinz])

**Response:** *The applicant has not requested a Limited Work Authorization (LWA) permit. Under NRC regulations, preconstruction activities such as the building of transmission lines are excluded from the definition of "construction" because they are outside the NRC's regulatory jurisdiction and not authorized by the NRC's licensing action. See 10 CFR 50.10(a); 72 FR 57416 (2007). The Commission has therefore explained that the impacts of those activities are to be analyzed in the environmental review for a combined license application, but in the context of cumulative impacts (72 FR 57421). The review team has evaluated the impacts of construction and preconstruction activities and they are discussed in Chapter 4 of this document. No changes were made to the EIS as a result of this comment.*

### **E.2.3 Comments Concerning Site Layout and Design**

**Comment:** It is, in my informed opinion, that the environmental impact survey does not adequately address the lack of licensing and design approval for the AP 1000 reactor. (0002-13 [Anderson, Russell])

**Comment:** As the NRC is aware, the Westinghouse AP 1000 design that SCE&G is pursuing isn't even certified, and has yet to be built, or operate anywhere in the world. These risks are not adequately addressed in this Draft Environmental Impact Statement. (0003-2 [Hancock, Mandy])

**Comment:** I think that the Environmental Impact Statement process is quite premature. You may not be aware, and the EIS doesn't properly discuss this, that this AP 1000 reactor that is being considered for this site, has never been built anywhere in the world. You may have heard this during the scoping comments last year. China is currently building some of these reactors, and the United States is watching what happens in China. But the reactors have never been built, they are not licensed in the United States, the design is not licensed. And, in fact, the building that goes over the top of the reactor containment, the review of that building called the shield building, is on hold, because the design was flawed, and Westinghouse had to turn in a new design a couple of weeks ago, which is being reviewed. There is no schedule for the

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review of this critical component. So we living here, particularly in the Jenkinsville area, could be guinea pigs to this never built and not licensed design. (0004-42 [Clements, Tom])

**Comment:** As the NRC is aware, the Westinghouse AP1000 design that SCE&G is pursuing is not certified and has yet to be built or operate anywhere in the world. (0017-2 [Barczak, Sara] [Hancock, Mandy])

**Response:** *NRC regulations allow an applicant for a combined construction permit and operating license (COL) to reference a design that has been certified. In addition, an applicant for a COL may "...at its own risk, reference in its application a design for which a design certification application has been docketed, but not granted" [see 10 CFR 52.55(c)]. The NRC will not issue a COL referencing a standard design until it has been certified through a NRC rulemaking. The NRC conducts a concurrent safety review of each COL application along with the environmental review; the results of the NRC's safety review are published in a Safety Evaluation Report. Regarding concerns about the viability of new reactor designs, approval of designs is contingent on the rigorous safety review of the design control document (DCD) and their construction is verified by inspections, tests, analyses, and acceptance criteria (ITAAC) prior to initial testing and operation. No changes were made to the EIS as a result of these comments.*

**Comment:** 3.2.2.3 Other Structures w/a permanent environmental interface, Pg 3-16, line 9: Table 3-1: Information updated in Rev. 1 [of Santee Cooper Transmission Line Siting Study] (0016-42 [Clary, Ronald])

**Response:** *Table 3-1 was updated to reflect Revision 1 of the Santee Cooper Transmission Line Siting Study (MACTEC 2009) and Addendum 1 to the SCE&G Transmission Line Siting Study (Pike 2010).*

**Comment:** 3.3.2 Summary of Resource Commitments during Construction and Preconstruction, Pg 3-25, Table 3-3: Discussion of New transmission line is accurate if the DEIS does not consider additional parallel ROW to be "New", otherwise this table should be updated as a result of Rev. 1 of siting study (0016-43 [Clary, Ronald])

**Response:** *In Table 3-3, "new" corridor does not consider additional parallel rights-of-way (ROWs). The table was revised to include the mileage of new corridor as well as additional parallel ROWs per the updated Santee Cooper and SCE&G transmission-line siting studies (MACTEC 2009; Pike 2010).*

**Comment:** Page 3-28, line 4, also lines 12-13: Line 4 - Delete after semicolon "this water is known as blowdown."

Lines 12-13 - Delete sentence "The blowdown water from each cooling tower would collect in a basin ... " This water is not blowdown water at this point. (0016-19 [Clary, Ronald])

**Response:** Section 3.4.2.3 of the EIS was revised to clearly describe cooling-water circulation and removal of blowdown water.

**Comment:** [My troubleshooting and verification found ERRORS in:]

Lack of understanding of cooling systems physics.

Lack of understanding of electrical transportation and its safety. (0018-5 [Wojcicki, Joe])

**Response:** The comment does not specify what errors were found or whether those errors were in the EIS. The review was based on information presented in the COL application Environmental Report (ER) submitted by the applicant and information obtained from independent sources. The EIS describes the environmental interfaces of the proposed cooling system structures in Sections 3.3 and 3.4; the environmental impacts of the proposed cooling system are described primarily in Sections 4.2 and 5.2 (water-related impacts) and Sections 4.3.2 and 5.3.2 (aquatic ecological impacts). Alternative cooling systems are described in Section 9.4. Although electrical transmission and its safety are outside the regulatory authority of the NRC, the review team (which includes the U.S. Army Corps of Engineers [USACE]) considered the environmental impacts of electrical transmission, which are described in Sections 4.1.2 and 5.1.2 (land use); 4.3.1, 4.3.2, 5.3.1, and 5.3.2 (ecological impacts); 4.6.2 and 5.6 (historical and cultural impacts); and Section 4.8 (nonradiological health impacts). No change was made to the EIS as a result of this comment.

#### **E.2.4 Comments Concerning Land Use – Transmission Lines**

**Comment:** Pg 2-8, lines 14-30: Discussion of Transmission lines do not match/reference MACTEC 2008, although similar; VCSNS-Varnville discussion omits Pomaria substation. Information provided in Rev 1 of siting study.

Pg 2-10, Figure 2-5: Santee Cooper lines/substations/routing need to be adjusted based on Rev 1 of siting study. (0016-35 [Clary, Ronald])

**Comment:** 2.2.2 Transmission-Line Corridors, Pg 2-11 & 2-13, Table 2-3: MACTEC 2008 includes discussions/data pertaining to both Land Use and Land Cover in Sections 3.3 and 3.4, respectively, but information found on page 2-11 or included in Table 2-3 is not from MACTEC 2008 and should not be cited as such. Rev 1 includes current land use/land cover acreages in areas of proposed new ROW. (0016-36 [Clary, Ronald])

**Response:** Section 2.2.2 of the EIS was modified to include updated information on the transmission lines proposed by SCE&G and Santee Cooper, including information from Revision 1 of the Santee Cooper Transmission Line Siting Study (MACTEC 2009) and Addendum 1 to the SCE&G Transmission Line Siting Study (Pike 2010).

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### **Comment:** 4.1.2 Transmission-Line Corridors and Other Offsite Areas

Pg 4-7, line 9: Information updated in Rev. 1

Pg 4-7, line 36: change to "apply for required USACE permits"

Pg 4-8, line 19: Transmission discussion does not match MACTEC 2008 report. Also, needs to include Pomaria SS reference. Information updated in Rev. 1

Pg 4-8, lines 30-36: Information should be updated as a result of Rev. 1

Pg 4-9, Table 4-1: Length and Acres for Flat Creek and Varnville are updated in Rev. 1  
(0016-44 [Clary, Ronald])

**Response:** *Section 4.1.2 of the EIS was modified to address each item in this comment, including the use of updated information on the transmission lines proposed by SCE&G and Santee Cooper. The updated transmission-line information includes design and routing data from Revision 1 of the Santee Cooper Transmission Line Siting Study (MACTEC 2009) and also from Addendum 1 to the SCE&G Transmission Line Siting Study (Pike 2010).*

### **Comment:** 9.3.4.1 [9.3.5.1, 9.3.6.1] Land Use and Transmission-Line Corridors

Pg 9-90, lines 32-35: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].

Pg 9-127, lines 19-22: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].

Pg 9-163, lines 22-25: Identical comment as pg 9-57, lines 18-22 above.

Pg 9-163, line 30: acreage/length for transmission lines is for both SCE&G and Santee Cooper.  
(0016-62 [Clary, Ronald])

**Response:** *Sections 9.3.4.1, 9.3.5.1, and 9.3.6.1 of the EIS were modified to address each item in this comment.*

**Comment:** I live across the Broad River, in the Newberry side. And back in '75 we had the power line from Unit Number 1 come through our property at 100 foot width. And I notice on page 211 of the proposal, 2.1, I believe it was, that with the addition of two more units, they are going to need 400 more feet. And I, in my mind, I can't do the math. You know, if you can get by with 100 feet of right-of-way for transmissions lines for one unit, why would you need 400 more feet for only two more units? (0004-23 [Hope, Ron])

**Comment:** Well, the 400 more feet that they are going to take, going close to a mile, I could have planted. In fact I have planted, and they are growing [to be] marketable timber some day. But if they come through and cut it out, it is not going to be worth near what it could be worth if it could mature. (0004-24 [Hope, Ron])

**Response:** *Environmental impacts associated with development and operation of the new transmission lines and rights-of-way following the routes and designs reported by the applicant to the NRC and the USACE are addressed in Chapters 4, 5, and 7 of the EIS. Applicants must consider multiple environmental and economic factors related to land use and other relevant issues when siting and designing transmission lines in accordance with applicable Federal, state, and local regulations. The EIS has been updated to include the most recent information provided by the applicant to the NRC and the USACE for the transmission lines. The discussion of land-use impacts in Sections 4.1 and 7.1 of the EIS has been expanded to provide more information on possible impacts of right-of-way development on forestry management and other existing land uses. Sections 4.5 and 7.4 of the EIS have been expanded to better characterize environmental justice (EJ) issues associated with the proposed transmission lines. Because the transmission lines would be developed over a relatively homogeneous rural landscape, mostly by using or paralleling existing rights-of-way, the discussion of associated EJ impacts is qualitative.*

### **E.2.5 Comments Concerning Hydrology – Surface Water**

**Comment:** Page 2-18, line 22: Wastes would include blowdown and discharges from the radwaste building as well as sanitary and industrial waste. (0016-2 [Clary, Ronald])

**Comment:** Page 2-29, line 12: DEIS states, "All VCSNS Units 2 and 3 cooling water would discharge to Parr Reservoir." This statement implies open-cycle cooling. Suggested language would be "blowdown from cooling towers would discharge to Parr Reservoir." (0016-3 [Clary, Ronald])

**Response:** *These comments are editorial in nature. Section 2.3 of the EIS was changed to address these comments.*

**Comment:** And then we, also, are concerned about the consumption of the water, the water treatment plant, they are building a 30 million dollar proposed complex. Where is all the water coming from, how is the sewer system going to be treated, and what role does SCE&G play in this? (0002-8 [Marcharia, Kamau])

**Response:** *The impacts of operating VCSNS Units 2 and 3 on water quality and water supply are addressed in Chapter 5 of the EIS. Cooling water and potable water for VCSNS Units 2 and 3 would be taken from Monticello Reservoir and cooling-water blowdown would be discharged to Parr Reservoir. Potable water would be processed by a new water-treatment plant and*

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*material collected through the sanitary sewers servicing Units 2 and 3 would be treated in a new onsite sewage-treatment facility that would be in compliance with industry design standards, and effluents would be in compliance with the Clean Water Act and other requirements enforced through a National Pollutant Discharge Elimination System (NPDES) permit. SCE&G would own and operate the water system and the sewage-treatment facility. No changes were made to the EIS as a result of this comment.*

**Comment:** Nuclear power plants have a large impact on water quantity and quality. Nuclear power plants release radioactive contaminants, and hazardous materials, into surrounding water resources, contributing greatly to thermal pollution, negatively impacting aquatic life, and requiring enormous volumes of water in order to operate. (0003-8 [Hancock, Mandy])

**Comment:** Nuclear power plants have a large impact on water quantity and quality. Nuclear power plants release radioactive contaminants and hazardous chemicals into surrounding water resources, contribute greatly to thermal pollution, negatively impact aquatic life, and require enormous volumes of water in order to operate. (0017-7 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The impact of operating VCSNS Units 2 and 3 on water quality and water supply are addressed in Chapter 5 of the EIS. No changes were made to the EIS as a result of these comments.*

**Comment:** Nuclear power requires more water than other traditional forms of energy production, and significantly more water than energy efficiency measures. (0003-9 [Hancock, Mandy])

**Response:** *The environmental impact of nuclear power is compared to power-generating alternatives in Chapter 9 of the EIS. No changes were made to the EIS as a result of this comment.*

**Comment:** Neither this reality, nor the history of severe drought in this region is adequately considered in the Draft EIS. The Draft EIS states that Unit 1 uses 767 millions of gallons of water per day, and Table 3.6, in the draft, show that the proposed two nuclear reactors will withdraw 53.5 million gallons of water per day from the Monticello Reservoir, during normal use, and consume or lose between 33 and 44 million gallons of water per day. These are massive quantities, so the combined water withdrawals from these three reactors would be over 820 million gallons of water per day, competing with the 93.4 million gallons used for the public use in the economic impact area. (0003-10 [Hancock, Mandy])

**Response:** *VCSNS Unit 1 uses once-through cooling, which means that the 767 million gallons of water withdrawn per day is returned to Monticello Reservoir and a small portion of that volume is lost to the atmosphere through enhanced evaporation because the water is warmer when it returns to the reservoir. Table 3.6 of the EIS indicates that the two proposed power*



*plants would consume 27,751 gallons of water per minute or about 40 million gallons per day. Section 5.2 considers both the long-term annual and lowest annual mean flows in evaluating the impact of operating the proposed units on water supply in the region. No changes were made to the EIS as a result of these comments.*

**Comment:** The last thing I wanted to say was the comment that the surface water, that only one percent is going to be consumed, reminds me of Soviet elections, where 99.9 percent of the people voted for the President. The bottom line is that is one percent of the flow of the river on average. It has nothing to do with what happens when we have droughts, which we have been known to have in this area. They almost had to shut down the reactors on Lake Wiley because the water got too warm because the water levels had dropped. They had to have water problems, delivering water down the river, which affected the rest of the river down from the power plant. (0004-21 [Jocoy, Gregg])

**Comment:** In the drought season, and the southeast is already a drought zone for existing 24 reactors, according to the Nuclear Regulatory Commission. South Carolina authorities will probably have a problem, which institutions should be disconnected from the water supply in this drought situation. It should be residential community, hospitals, school, fire brigade, or whatever. In a drought, or hot season, the reactor cooling system will force shut-down, and stop production of electricity, so their generation will not meet base load criteria. The base load criteria is 90 percent of the time. Presented in South Carolina electrical document calculations with assumptions not meet criteria of common sense and do mislead people. ORS, Office of Regulatory Staff, which is kind of group who is supposed to be engineer that prepared information practically did not verify these numbers, so Public Service Commission make a decision of this location without proper analysis. (0004-33 [Wojcicki, Joe])

**Comment:** In a drought season (Southeast is already a drought zone for existing 24 reactors according to Nuclear Regulatory Commission) SC authorities might have a problem which institutions should have disconnected water supply, e.g. residential communities, hospitals, schools, fire brigades, etc. In a drought or hot season, reactor-cooling systems will force shut down and to stop production of electricity so their generation will not meet base load criteria - minimum of 90%. Presented in SCE&G document calculations / assumptions do not meet criteria of common sense and do mislead people. ORS [Office of Regulatory Staff of South Carolina] did not make their expected verification. (0005-3 [Wojcicki, Joe])

**Response:** *Chapter 7 of the EIS considers existing and planned future demand on the Broad River in the evaluation of the impact of the proposed units on the river. The maximum water consumption anticipated for the proposed new units at the VCSNS site would use about 1 percent of the average annual flow of the Broad River and about 1.6 percent of the flow during the lowest monthly average flow during the period for which records exist. This average river flow reflects upstream cumulative consumptive uses of current users including the consumptive*

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*use associated with VCSNS Unit 1. No changes were made to the EIS as a result of these comments.*

**Comment:** The Broad river system, from which the V.C. Summer will rely is already stressed, and is relied upon by a variety of industrial and municipal users. (0003-11 [Hancock, Mandy])

**Comment:** These two reactors will evaporate 40 million gallons of water from 53 millions, additionally, besides existing reactor Unit 1, withdrawn from the Broad River per day. So 53 million is going to withdraw, and 40 million is going to evaporate. This is information from the Westinghouse. Planned another two AP 1000 reactor by Duke Energy Carolinas would increase this number to over 100 million water withdrawn from the Broad River, with 80 million per day which is evaporated. Broad River is a base source of water for Great Columbia and South Carolina Midlands region. The city of Columbia may inform you how many millions of gallons are presently taken from this river. It is approximately exactly this same number. (0004-32 [Wojcicki, Joe])

**Comment:** These reactors are going to use, by evaporative cooling, 35 to possibly 45 million gallons a day of water, the two reactors that are planned here. This has to be viewed, and I don't think the EIS has done this in any way, in conjunction with what is happening upstream. The Broad river flows out of North Carolina, past the Cliff Side Coal Plant, just north of the border, where millions of gallons of water are used. Duke Energy, just south of the border, has proposed building two AP 1000 reactors, and they would also use 35 to 40 million gallons of water from the river. And I don't see an indication that the cumulative impacts of water usage have been taken into account in this draft document. (0004-45 [Clements, Tom])

**Comment:** These two reactors would evaporate 40 million gallons of water from 53 millions additionally (beside existing reactor -Unit 1) withdrawn from Broad River per day.

Planned another two AP 1000 reactors by Duke Energy Carolinas would increase this number to over 100 million water withdrawn from the Broad River and 80 million gal per day to be evaporated from the river.

Broad River is a base source of water for Great Columbia and SC Midlands region. City of Columbia may inform you how many millions of gallons of water are presently taken from this river. (0005-2 [Wojcicki, Joe])

**Comment:** Neither this reality, nor the history of severe droughts in this region, is adequately considered in the DEIS. The DEIS states that Unit 1 uses 767 million gallons of water per day. Table 3-6 in the draft EIS shows that the proposed two new reactors are estimated to withdraw 53.5 million gallons per day from the Monticello reservoir during normal use and consume, or lose, between 39-44 million gallons per day. These are massive quantities. So the combined water withdrawals for all three reactors (1 existing, 2 proposed) would be over 820 million

gallons per day, competing with the 93.4 million gallons per day required for public use in the economic impact area of the proposed site.

The Broad River system, from which the existing and proposed new V.C. Summer reactors will rely, is already stressed and is relied upon by a variety of industrial and municipal users. Further, other proposals, such as Duke Energy's efforts to expand the Cliffside coal plant and build two new reactors at the Lee site in South Carolina, also aim to use huge amounts of water from the Broad River. The full extent of these proposed impacts are not discussed in the draft EIS. With all of these proposals simultaneously underway, the combined effect of these proposals must be evaluated by the NRC to ensure informed and prudent decisions are made on how to best use limited water resources. (0017-9 [Barczak, Sara] [Hancock, Mandy])

**Comment:** [My troubleshooting and verification found ERRORS in:] Lack of understanding or ignorance of very likely probability of less than 90 % (possible down to 40-50%) annual time operation for the units #2 & 3, if Duke Energy Carolinas two AP 1000 will enter the SE grid [regarding water supply to operate new units reliably]. (0018-8 [Wojcicki, Joe])

**Response:** *The review team's evaluation of the cumulative impact of past, current, and planned consumptive use of water in the Broad River basin is discussed in Section 7.2.1 of the EIS and includes the consideration of the power plants proposed by Duke. No changes to the EIS were made as a result of these comments.*

**Comment:** Page 5-9, line 33: Suggest changing sentence to read: "Based on the Parr Reservoir eastern channel width of approximately 600 feet, the largest mixing zone size could be 300 ft across the channel and 1200 ft along the channel." (0016-29 [Clary, Ronald])

**Response:** *Section 5.2.3.1 was modified to address this comment.*

**Comment:** Page 4-13, line 19: The statement that any withdrawal other than for Unit 1 needs FERC approval is not accurate. FERC approval is required for withdrawal for cooling water for additional nuclear power plants. (0016-20 [Clary, Ronald])

**Response:** *Section 4.2.2.1 was revised to address this comment.*

**Comment:** Page 4-15, line 16: Discharge to Parr Reservoir does not require FERC approval. Construction of the discharge structure within the FERC Project Boundary Line does require approval. (0016-21 [Clary, Ronald])

**Response:** *Section 4.2.3.1 of the EIS was revised to address this comment.*

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### **Comment:** 5.2.2.1 Impacts on Surface-Water Use

The DEIS indicates that consumptive water loss associated with the operation of Units 2 and 3 would be between 62 cfs (normal operation) and 69 cfs (maximum use). Article 14 of the current license issued by the Federal Energy Regulatory Commission (FERC) for Parr Hydroelectric Project requires: "a minimum daily average flow of 800 cfs, or the daily natural inflow to the Parr Reservoir (less evaporative losses from the Parr and Monticello Reservoirs), whichever is less."

However, it is not clear whether evaporative loss through cooling towers, which would now include Units 2 and 3 if licensed, is included in the total evaporative loss subtracted from the daily natural inflow when inflow is less than 800 cfs. DNR requests clarification on how the total evaporative loss to be subtracted from minimum flows will be derived. The current FERC license for the Parr Hydroelectric Project expires on June 30, 2020. It is anticipated that the relicensing process will be initiated by SCE&G in approximately 5 years. During relicensing, issues regarding potential impacts to natural resources will be examined. Chief among these are issues of water supply and the adequacy of current minimum flows to support aquatic resources in Parr Reservoir, and the Lower Broad River. It should be noted that changes in required minimum flows in the new FERC license for Parr Hydro may have bearing on water availability for Units 2 and 3. (0020-10 [Perry, Robert D.]

**Response:** *The review team analysis treated the water evaporated through the cooling towers as a consumptive use of the water and not as an evaporative loss from the reservoirs. The impact of a potential future decrease in available water supply and a possible mitigative approach is discussed in Section 5.2.2.1 of the EIS. No changes to the EIS were made as a result of this comment.*

**Comment:** The Review Team compared the long-term annual (6300 cfs) and lowest annual mean (2150 cfs) flows for the Alston gauging station to the surface water consumptive loss associated with Units 2 and 3 and concluded that this would represent a loss of approximately 1% of the long-term annual mean of Broad River flows. For the lowest annual mean flow consumptive water loss would be approximately 3%. Mean calculations, while helpful for estimating water balance over some specified temporal period, does not capture instantaneous impact to aquatic organisms. Also, flows in the Broad River have historically been as low as approximately 220 cfs. If anticipated consumptive loss from Units 2 and 3 is subtracted from average daily flow during periods of flow as low as 220 cfs, the percent loss of Broad River flow increases from 28% (of 62 cfs normal operation) to 31% (69 cfs maximum operation). Monticello Reservoir is proposed as a source of cooling water during periods of low inflow, but it should be noted that during extended periods of low inflow it will take progressively longer to refill Monticello Reservoir consequently resulting in longer periods that water is diverted from Parr Reservoir and the Broad River. The assimilative capacity of Parr Reservoir to mix the thermal discharge is also reduced during these periods. (0020-11 [Perry, Robert D.]

**Comment:** [My troubleshooting and verification found ERRORS in: ] Lack of understanding or ignorance of NRC own drought zone classification for SE region done for already existing reactors. (0018-6 [Wojcicki, Joe])

**Response:** *Section 5.2.1.1 discusses water available from the Broad River for operating the proposed units and compares water consumption to mean annual flow and lowest mean monthly flow in the river. The section also considers the 7Q10 flow (lowest flow for 7 consecutive days expected to occur once per decade) to assess the impacts of alteration to flow during low-flow periods. During these low-flow periods the consumptive use of water by the plant would reduce flows by 7 to 8 percent. This is within a range that the review team considers to be a small impact on the resource. The review team recognizes that during the summer of 2008 the Broad River experienced flows as low as 220 cfs, but does not believe that those conditions represent a new baseline condition for the Broad River basin. Furthermore, if flows decline to a level that the consumptive use of water by the plant's cooling system or the discharge of blowdown to the Broad River represent a significant impact, the plant may be required by relevant State water-permitting authorities to derate or stop operation. No changes were made to the EIS as a result of these comments.*

**Comment:** SCE&G currently is developing a revised updated CORMIX model of the thermal plume in Parr Reservoir using the most recent version of CORMIX. SCE&G has committed to consult with DNR during this process and in the development of an acceptable water quality monitoring program, whatever alternative is chosen, to assure that water quality is not degraded. (0020-15 [Perry, Robert D.]

**Response:** *The review team reviewed the results of previous CORMIX modeling performed by the applicant and then performed an independent calculation to confirm the results. The results of that calculation are presented in Section 5.2.3.1. Section 5.2.4 of the EIS discusses water monitoring and describes the role of the South Carolina Department of Health and Environmental Control (SCDHEC) during site activity permitting; this section was revised to indicate the South Carolina Department of Natural Resources' (SCDNR's) role in establishing the surface-water quality monitoring program.*

**Comment:** The DEIS states that an assessment of the water-quality impacts on the Parr Reservoir and the Broad River from discharge of Units 2 and 3 showed that both the thermal impacts and the impact of discharging solutes and solids concentrated through evaporation in the cooling towers would be minimal and localized to the zone defined by the thermal plume, (page 7-13). The FEIS should clarify if the thermal discharge will meet state water quality standards or whether they will need to apply for a Clean Water Act section 316(a) thermal variance (which will require a demonstration that any alternative limit is more stringent than necessary to propagate a balanced, indigenous population in the Parr Reservoir). (0023-12 [Mueller, Heinz])

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**Response:** *Prior to operation of Units 2 and 3, the applicant is required to obtain a NPDES permit from SCDHEC to discharge liquid effluent to a surface water body; this permit would contain any water-quality conditions or requirements including any related to the Clean Water Act Section 316(a). No change to the EIS was made as a result of this comment.*

**Comment:** Furthermore, the FEIS should also address any additional surface water withdrawal concerns raised by the recent passage of South Carolina's Water Withdrawal Act (H.452). (0023-14 [Mueller, Heinz])

**Response:** *The requirement to comply with the reporting requirements of South Carolina's Water Withdrawal Act (H.452) was added to Section 5.2 of the EIS.*

**Comment:** Full consideration of potential hydrological effects from climate change should also be included in the EIS. (0021-7 [Croom, Miles])

**Response:** *Climate change in the region around the VCSNS site is discussed in Section 2.9.1 of the EIS. The impact of changes in climate during the life of proposed Units 2 and 3 could result in either an increase or decrease in the amount of runoff; the divergence in model projections for the southeastern United States precludes a definitive estimate. This uncertainty is considered in Section 5.2.2.1 where the potential hydrologic impacts of climate change are discussed. No change was made to the EIS as a result of this comment.*

**Comment:** In addition, the FEIS should contain detailed information regarding compliance with Clean Water Act section 316(b) cooling water intake structure requirements for both the existing cooling water intake structure for Unit 1 and proposed new cooling water intake structures for Units 2 and 3. The discussion should address the integration of existing operations and infrastructure with the operations and infrastructure with the new units. The 316(b) New Facility Rule (40 CFR Part 125 Subpart I) compliance discussion will also need to address the preservation of the natural thermal stratification in the Monticello Reservoir. (0023-13 [Mueller, Heinz])

**Response:** *The EIS does mention in Section 5.2 the Clean Water 316(b) regulation. Requirements of Unit 1 pursuant to 316(b) are not within the scope of the proposed action of this EIS. The general expectation is that thermal stratification is seasonal and location dependent. The Monticello Reservoir is currently used as the Unit 1 cooling pond and as a pumped storage reservoir by the Fairfield Pumped Storage Facility (FPSF). Unit 1 cooling needs and the FPSF require the cycling of 1190 and 14,700 cfs, respectively, and create moderate fluctuations in reservoir water levels. Despite this, in the EIS for the license renewal of Unit 1, the NRC staff concluded that there were no impacts on the natural thermal stratification of Monticello Reservoir. The maximum intake volume from Monticello Reservoir for Units 2 and 3 will be 137 cfs, which is small relative to the volumes that cycle daily through the Unit 1 cooling-water system and the FPSF. This volume is also small relative to that of*

*Monticello Reservoir. As a result, the expected impact on thermal stratification is considered to remain small. No change was made to the EIS as a result of these comments.*

## **E.2.6 Comments Concerning Hydrology – Groundwater**

**Comment:** [C]larification of the source of nonradiological parameters which exceeded SCDHEC drinking water standards in sampling data, as well as impacts related to radiological contaminants, particularly tritium, should be addressed in the FEIS. Also, updated sampling data, if available, should be included. (0023-1 [Mueller, Heinz])

**Comment:** Groundwater sampling data showed levels exceeding SCHEC drinking water standards regarding nonradiological parameters (in 2007) and Gross Alpha radiation (in 2008). The FEIS should clarify whether the exceedance of SCDHEC nonradiological drinking water standards is related to the existing VCSNS Nuclear Station. Based on the SCDHEC groundwater sampling data in the vicinity of proposed VCSNS Units 2 and 3, groundwater exceeded the SCDHEC State Drinking Water standards in at least one well during a sampling round for the following analyses: sulfates, total dissolved solids, turbidity, total coliform, cadmium, iron, lead, and pH. (0023-15 [Mueller, Heinz])

**Response:** *Information about groundwater quality is described in Section 2.3.1.2 of the EIS and is based on the applicant's sampling of pre-construction characterization wells around the locations of proposed Units 2 and 3 (sampling results are detailed in Tables 2.3-35 and 2.3-36 of the VCSNS ER Rev 2). The applicant stated that it will not be using onsite groundwater for a drinking water source during construction or operations. Section 5.9 of the EIS addresses the radiological impacts of operation of the proposed Units 2 and 3. The cause of the exceedance of SCDHEC drinking water standards for specific analytes in the baseline groundwater sampling and analyses is outside the scope of this EIS. No change was made to the EIS as a result of these comments.*

## **E.2.7 Comments Concerning Ecology – Terrestrial**

**Comment:** Page 2-40 Table 2-14: the approximate percentages are incorrect for Open Water (should be 0.242), Urban Land (should be 0.107), and Wetlands (should be 0.012). (0016-4 [Clary, Ronald])

**Response:** *Table 2-14 has been removed as part of other revisions to the EIS.*

**Comment:** Page 2-48, line 14: Should read "is protected under". (0016-6 [Clary, Ronald])

**Response:** *Section 2.4.1 of the EIS was changed to address this comment.*

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**Comment:** 4.3.1.1 Terrestrial Resources -Site and Vicinity, Pg 4-18, lines 1-3: MACTEC 2008 should be referenced here (Section 4.4), to indicate that land under the new transmission line "will be maintained in an early successional grassland or shrub/scrub vegetation". (0016-45 [Clary, Ronald])

**Comment:** 4.3.1.2 Terrestrial Resources -Transmission Lines

Pg 4-24, last paragraph: Based on Table 3-9 in Section 3.3 of MACTEC 2008, new ROW consists of approximately 30 acres, not 45. However, the information in this paragraph should be updated as a result of Rev. 1.

Pg 4-24, lines 20-22, adjust cleared ac. (45) MACTEC 2008 Table 3-9 pg 3-14 shows approx. 30 acres not 45. Remove SCE&G reference and entire ac (3534). Suggest separating SCE&G from this section about Santee Cooper Lines. (0016-46 [Clary, Ronald])

**Comment:** Pg 4-26, line 13: Likely to require revision based on Rev. 1 of siting study  
Pg 4-26, second paragraph: Numbers will require revision based on Rev. 1 of siting study (0016-47 [Clary, Ronald])

**Response:** *Section 4.3.1 of the EIS was modified to address each item in these comments. Updated information about transmission-line routing and design provided by Santee Cooper and SCE&G was incorporated; references were checked and corrected if necessary.*

**Comment:** 5.3.1.2 Terrestrial Resources -Transmission Lines: Pg 5-17, lines 15-16: Santee Cooper also indicated that new transmission structures would be "raptor safe". (0016-49 [Clary, Ronald])

**Response:** *Section 5.3.1 of the EIS was modified to indicate that both the SCE&G and Santee Cooper proposed transmission lines would be "raptor safe."*

**Comment:** 9.3.3.3 [9.3.4.3, 9.3.5.3, 9.3.6.3] Terrestrial and Wetland Resources

Pg 9-57, lines 18-22: all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures

Pg 9-96, lines 24-27: Identical comment as pg 9-57, lines 18-22 above.

Pg 9-134, lines 6-9: Identical comment as pg 9-57, lines 18-22 above.

Pg 9-170, lines 3-6: Identical comment as pg 9-57, lines 18-22 above. (0016-59 [Clary, Ronald])



**Response:** Sections 9.3.3.3, 9.3.4.3, 9.3.5.3, and 9.3.6.3 of the EIS were updated to state that all land clearing would be conducted in accordance with existing SCE&G or Santee Cooper procedures.

**Comment:** 2.4.1.3 Important Terrestrial Species and Habitats, Important Species - Transmission Lines: The DEIS states that SCE&G and Santee Cooper conducted reconnaissance-level studies for each proposed transmission-line corridor and determined there were 3 recorded occurrences of protected species within 100 to 500 ft of the proposed VCSNS-St. George transmission-line corridor. These protected species were not specified. Field surveys have not yet been conducted but are proposed once siting for transmission lines has been finalized. Pending results of these surveys, DNR requests consultation during Phase III of the finalization process to determine appropriate mitigation actions for any affected conservation priority and/or protected species. (0020-1 [Perry, Robert D.]

**Comment:** 5.3.1 Terrestrial and Wetland Impacts Related to Operation Avian Mortality Impacts from Power Transmission Lines: There is risk of avian collision mortality due to structures associated with transmission lines. Certain better management practices (BMPs) can reduce this risk. DNR requests consultation on BMPs to reduce the risk of avian mortality from transmission lines. (0020-16 [Perry, Robert D.]

**Comment:** Important Habitats -Transmission Lines. The expansion of existing transmission line right-of-ways (ROWs) and the construction of new transmission lines will convert a variety of wetland habitat types (seep, shrub bog, forested palustrine and others) to mowed and maintained ROW and will impact intermittent and perennial streams. The DEIS indicates that wetland delineations have not been conducted for the proposed transmission line routes. Pending selection of final routes, DNR requests that all potentially affected wetlands and streams within the finalized corridors be fully delineated and that affected habitat types be inventoried and any impacts appropriately mitigated in consultation with resource agencies (0020-2 [Perry, Robert D.]

**Comment:** 2.4.1.4 Terrestrial Ecology Monitoring - The Review Team concluded that adequate information was available to assess ecological impacts of the construction of Units 2 and 3 at the VCSNS site, but more information about the proposed transmission system would be required to provide adequate data to characterize and track terrestrial ecological impacts associated with specific transmission-line corridor routes. DNR concurs with this assessment and has requested consultation during ROW site finalization and transmission line construction. (0020-3 [Perry, Robert D.]

**Comment:** 4.3.1.2 Terrestrial Resources - Transmission Lines Potential impacts from the conversion of wetlands to maintained ROW for the proposed transmission lines are significant (220 acres according to the DEIS) and permanent. A wide variety of important wetland habitat types may be impacted. DNR requests full consultation during finalization of the transmission

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line corridors to address avoidance, minimization and mitigation measures for these and other important terrestrial habitats. (0020-9 [Perry, Robert D.]

**Response:** *The applicant provided revised transmission line routing information. Sections 2.4.1, 4.3.1, 5.3.1, and 7.3.1 of the EIS have been revised to reflect the updated information. The SCDNR, the U.S. Fish & Wildlife Service (FWS), other agencies, and the public will have an opportunity to comment on the updated discussion prior to issuance of a permit by the USACE.*

**Comment:** Construction of transmission lines is estimated to convert 224.2 acres of forested wetlands to nonforested wetlands. EPA has concerns about the transmission line impacts, and we note that the Clean Water Act Section 404 permit application has not yet been submitted for transmission line impacts. We understand that a revised public notice is pending, and will include the estimated wetlands impacts related to transmission lines. The alternatives analysis in the DEIS includes transmission line corridor impacts for each alternative. We recommend that the FEIS contain updated information regarding transmission line construction plans as they relate to wetlands impacts and habitat fragmentation. (0023-2 [Mueller, Heinz])

**Comment:** The DEIS states that "No areas designated by FWS as critical habitat exist at the VCSNS site," and that SCE&G conducted surveys for threatened and endangered species at the site and found none.

SCE&G stated it will perform detailed ecological surveys for Federal and State-listed threatened and endangered species along the transmission line routes as part of the permitting process prior to construction. Updated information regarding consultations with the U.S. Fish and Wildlife Service (FWS) and updated ecological survey results should be included in the FEIS. (0023-21 [Mueller, Heinz])

**Response:** *The assessments of potential impacts in Sections 2.4.1, 4.3.1, 5.3.1, and 7.3.1 of the EIS were revised to include updated information provided by the SCE&G and Santee Cooper regarding transmission-line routes and designs. Updated consultation correspondence is included in Appendix F of this EIS. Consultation will be completed prior to issuance of the COL.*

**Comment:** 2.4.1.2 Terrestrial Resources -Transmission Lines, Pg 2-45, lines 3-5, 14-15: Information updated in Rev 1 of siting study. (0016-37 [Clary, Ronald])

**Comment:** 2.4.1.3 Important Terrestrial Species and Habitats, Pg 2-51, last paragraph: This paragraph needs revising for Santee Cooper. Most of the information in this paragraph does NOT pertain to Santee Cooper and reference to Santee Cooper and MACTEC 2008 should be removed. Section 3.6 (page 3-28) and Sec 4.6 (pg 4-15) of MACTEC 2008 indicate that a majority of the Santee Cooper lines have been routed within existing transmission line corridors.

Santee Cooper conducted a threatened and endangered species survey on the 2.44 miles of proposed new ROW in July 2008. Santee Cooper plans to conduct additional protected species surveys along new ROW segments. (0016-38 [Clary, Ronald])

**Comment:** 2.4.1.3 Important Terrestrial Species and Habitats, Pg 2-53, line 18: Reference to MACTEC 2008 should be removed as Palustrine forest wetlands were not distinguished there. Pg 2-53, line 25: Rev 1 of the siting study indicates that wetlands and jurisdictional waters in areas of new ROW will be delineated and verified by the USACE prior to development. (0016-39 [Clary, Ronald])

**Response:** *These comments refer to transmission-line siting and design changes presented in Revision 1 of the Santee Cooper Transmission Line Siting Study (MACTEC 2009) that were not received in time to include in the draft EIS. The EIS has been revised to include the updated transmission-line siting and design information for both Santee Cooper (MACTEC 2009) and SCE&G transmission lines (SCE&G 2010a, Pike 2010). The EIS was revised to state that both utilities have completed wetland delineations on the proposed transmission-line corridors and received a Preliminary Jurisdictional Determination from the USACE.*

**Comment:** 5.3.1.3 Important Terrestrial Species and Habitats  
DNR recommends consultation with the US Fish and Wildlife Service regarding appropriate mitigation for the bald eagle (*Haliaeetus leucocephalus*), protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. (0020-17 [Perry, Robert D.]

**Response:** *The EIS, which contains information about the bald eagle and other resources managed under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, was made available to the FWS. The FWS responded that additional information about the routes and designs of the transmission line was needed before it could comment. Updated consultation correspondence with FWS is included in Appendix F of the EIS. Sections 4.3.1 and 5.3.1 of the EIS were revised to include updated information from SCE&G and Santee Cooper on impacts from the transmission lines to resources regulated by the FWS. The FWS will have an opportunity to comment on the updated discussion prior to issuance of a permit by the USACE .*

**Comment:** The [U.S. Fish and Wildlife] Service recommends that the Final EIS incorporate final corridor alignments of the transmission lines and a species/habitat impact analyses for each alignment. Comments regarding potential impacts to resources and T&E species or habitat cannot be made until the final locations are selected. (0022-1 [Herrington, Jay])

**Response:** *Sections 4.3.1 and 5.3.1 of the EIS have been revised to include updated information from SCE&G and Santee Cooper about impacts of the transmission lines on resources regulated by the FWS. The FWS will have an opportunity to comment on the updated discussion prior to issuance of a permit by the USACE.*

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**Comment:** The applicant is required to submit a Clean Water Act Section 404 permit application for the wetlands impacts related to construction of transmission lines, and the DEIS notes that these impacts would include conversion from forested to non-forested wetlands. The conversion of forested wetlands to non-forested wetlands constitutes a functional change in wetland type; any reduction in wetland functions will need to be compensated for. Transmission line construction may also result in habitat fragmentation, opening new corridors to off-road vehicle traffic, and other ecological impacts. EPA is concerned about these impacts and reserves the right to comment further on this issue. We understand that the applicant proposes to mitigate impacts by purchasing credits from mitigation banks.

The FEIS should include a conceptual compensatory mitigation plan that demonstrates that these losses in ecological functions will be replaced. In addition, the FEIS should identify the least environmentally damaging practicable alternative (LEDPA) and demonstrate how the preferred alternative has avoided wetlands and other water impacts to the maximum extent possible. (0023-11 [Mueller, Heinz])

**Response:** *The EIS has been revised to include updated information from SCE&G and Santee Cooper about impacts from the transmission lines. The EIS has also been revised to include more information on wetland mitigation approaches and opportunities. The USACE will make its final decision on the LEDPA in its Record of Decision, using the information in this EIS to the extent possible.*

### E.2.8 Comments Concerning Ecology - Aquatic

#### **Comment:** 4.3.2 Aquatic Impacts

Site preparation activities for building the cooling towers will result in the filling of more than 700 linear feet of Mayo Creek, which according to the DEIS supports populations of state conservation priority fish species. This activity will require a permit pursuant to §404 of the Clean Water Act (CWA) and a state water quality certification pursuant to §401 of the CWA. Mitigation for unavoidable impacts will be required as specified in the Federal Mitigation Rule. The joint public notice for this activity was published by the US Army Corps of Engineers, Charleston District on April 28, 2010 and DNR will provide comment on the proposed activity to ensure that impacts are avoided and/or minimized to the greatest extent practicable and appropriate mitigation for unavoidable impacts is provided. DNR notes the current public notice for on-site wetland impacts does not include transmission corridor wetland impacts, and DNR will object to this omission. (0020-8 [Perry, Robert D.]

**Response:** *The review team acknowledges the SCDNR's comments on the draft EIS and that SCDNR would provide separate comments on the USACE permit action. The USACE required the applicant to submit a revised permit application (pursuant to section 404 of the Clean Water Act) that would include proposed transmission routes and associated impact assessment. The permit application was revised on December 16, 2010. A Public Notice advertising the revised*

*application will be issued to coincide with the public availability of this EIS. Chapters 2, 4, 5, and 7, and Appendix F of the EIS were revised to include an evaluation of environmental impacts in the actual proposed transmission routes. The SCDNR will have an opportunity to comment on the project, including mitigation of unavoidable impacts, prior to issuance of a permit by the USACE. The USACE will address any comments received on the revised permit application in their Record of Decision.*

**Comment:** Page 2-61, line 10: SCDNR no longer restricts fishing to 2 days per week. (0016-10 [Clary, Ronald])

**Comment:** Page 2-55, lines 13-15: "... water. .. is released ... to provide power at Parr Shoals Dam ..." Water released from Monticello Reservoir from the FPSF provides power at the FPSF, not at Parr Shoals Dam or Parr Hydro. (0016-7 [Clary, Ronald])

**Comment:** Page 2-60 line 11: Samples were collected by SCE&G and analyzed by Carnagey  
Page 2-62, line 33: SCE&G collected samples and they were analyzed by CBS (0016-9 [Clary, Ronald])

**Response:** *Section 2.4.2 of the EIS was modified to address these comments.*

**Comment:** 4.3.2.2 Aquatic Resources -Transmission Lines

Pg 4-33, These are SCE&G Trans lines. Remove Santee Cooper reference. Santee Cooper lines are discussed on pg 4-34.

Pg 4-34, lines 5-30: Some numbers will require revision based on Rev. 1  
(0016-48 [Clary, Ronald])

**Response:** *Section 4.3.2 of the EIS was modified to address these comments and to include updated transmission-line siting and design information for both Santee Cooper (MACTEC 2009) and SCE&G transmission lines (SCE&G 2010a, Pike 2010).*

**Comment:** 7.3.2 Aquatic Ecosystem Impacts, Pg 7-17 lines 13-16: a complete list of basins crossed by all the proposed transmission lines should also include the Broad River Basin and the Catawba River Basin. (0016-52 [Clary, Ronald])

**Response:** *Section 7.3.2 of the EIS was modified to incorporate the information provided in this comment.*

**Comment:** 9.3.3.5 [9.3.4.5, 9.3.5.5, 9.3.6.5] Aquatic Resources

Pg 9-65, lines 4-6: Santee Cooper should not be identified with ground-disturbing activities at the site. In addition, per MACTEC 2008, Santee Cooper has committed to future coordination

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with the USFWS, which is likely to include a sampling plan identifying areas of suitable habitat for protected species along the ROW that may require additional field surveys.

Pg 9-67, lines 16-17: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].

Pg 9-102, lines 11-14: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].

Pg 9-140, lines 34-37: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].

Pg 9-175, lines 26-29: Identical comment as pg 9-57, lines 18-22 above [all land clearing would be conducted according to...existing SCE&G OR Santee Cooper procedures].  
(0016-60 [Clary, Ronald])

**Response:** *Sections 9.3.3.5, 9.3.4.5, 9.3.5.5, and 9.3.6.5 of the EIS were updated to state that all land clearing would be conducted in accordance with existing SCE&G or Santee Cooper procedures as appropriate for the location.*

**Comment:** Parr Reservoir: A total of 6 priority conservation status fish species have been identified in Parr Reservoir. Parr Reservoir is listed on the 2007 303(d) list as impaired for aquatic life due to phosphorous and copper excursions. It is unknown what effect the operation of Units 2 and 3 will have on water quality in Parr Reservoir and downstream of Parr Shoals Dam. DNR requests consultation in the development of an acceptable water quality monitoring plan to assure that operation of the proposed units does not degrade water quality in Parr Reservoir and the Lower Broad River. (0020-5 [Perry, Robert D.]

**Comment:** The DEIS references a study of the macro invertebrate community near the proposed location of the heated water discharge structures. The study concluded that there were: few differences in the benthic community and water quality conditions between the reference station and the proposed discharge location.

DNR notes that this is the pre-operational condition. It is unknown what impacts the addition of Units 2 and 3 may have on aquatic resources and water quality. An adaptive management plan that includes water quality and aquatic life monitoring should be developed in consultation with federal and state resource agencies to address any potential adverse impacts that may accrue from the proposed expansion. An assessment of aquatic vegetation in Parr Reservoir indicates the presence of 2 invasive plant species, alligatorweed (*Alternanthera philoxeroides*) and water primrose (*Ludwigia* spp.). The adaptive management plan should also include aquatic vegetation monitoring and a plan for managing invasive species developed in consultation/coordination with DNR. (0020-6 [Perry, Robert D.]

**Comment:** The DEIS also acknowledges that thermal, chemical, and physical effects associated with station blowdown into the Parr Reservoir have the potential to affect the distribution and abundance of some aquatic species. Monitoring should be in accordance with the NPDES Permit. (0023-19 [Mueller, Heinz])

**Response:** *Pursuant to the Clean Water Act, the EPA has the authority to require water-quality monitoring for physical and/or chemical parameters in the waters of the United States. In South Carolina, the EPA delegates this authority to the SCDHEC. Prior to operation of VCSNS Units 2 and 3, the applicant is required to obtain an NPDES permit from SCDHEC to discharge liquid effluent to a surface-water body; this permit would contain any water-quality monitoring conditions or requirements. No changes were made to the EIS as a result of these comments.*

**Comment:** EFH for federally managed fishery species is present in tidal freshwater and estuarine portions of the Santee Cooper River Basin, downstream from the V.C. Summer Project. It is important to note that American shad, river herring, and other related native members of the Family Clupeidae that migrate to estuarine or coastal marine waters are an important food source for federally managed species when utilizing their EFH. Direct effects on EFH are not anticipated from the project, hence an EFH assessment does not appear to be needed based on the current information. (0021-2 [Croom, Miles])

**Response:** *This comment confirmed the review team's understanding that an Essential Fish Habitat (EFH) assessment is not required for this project. No change to the EIS was made as a result of this comment.*

**Comment:** 7.3.2 Aquatic Ecosystem Impacts

This section includes the Review Team's assessment of cumulative impacts associated with the operation of Units 2 and 3, when combined with the effects of past, present and reasonably foreseeable future actions. The geographic area of interest considered by the Review Team includes the drainage basin from Neal Shoals Dam to the Parr Shoals Dam. However, cumulative impacts could also potentially extend further downstream of Parr Shoals Dam if water quality and/or supply to the shoal habitat immediately downstream of the dam is affected. Cumulative adverse impacts have the potential to compromise robust redhorse and diadromous and anadromous fish restoration efforts as spawning, growth and reproductive success may be affected. (0020-19 [Perry, Robert D.]

**Comment:** Fishery and Aquatic Resources of the Santee River Basin

Public trust fishery and aquatic resources directly and indirectly affected by project construction and long-term operation include ocean-migratory diadromous fish species, important riverine spawning and maturation habitats, riparian wetlands, water quantity and quality, and essential fish habitats for federally managed fishery species. Diadromous fishes of importance include American shad, river herring, striped bass, American eel, Atlantic sturgeon, and shortnose sturgeon; shortnose sturgeon is listed as endangered under the Endangered Species Act, and

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Atlantic sturgeon is listed as a species of special concern and a candidate for listing under the Endangered Species Act. State and federal fishery resource agencies are actively pursuing habitat restoration, fish passage, and recovery of migratory diadromous fish species in the Santee River Basin. Active research, monitoring and restoration projects are in progress in coordination with SCE&G, the South Carolina Public Service Authority, Duke Energy, and interested conservation organizations. The Congaree-Broad River Sub-Basin is identified as a high priority for habitat restoration, future expansion of fish passage, and recovery of diadromous species. For this reason, consideration of present and future project effects on diadromous species must be fully considered in assessment of project effects and determination of effective mitigation measures. (0021-1 [Croom, Miles])

**Comment:** The Draft EIS does not adequately describe or consider the potential long-term effects of the proposed actions on protection, management, and restoration of important diadromous fishery resources and on the survival and recovery of the endangered shortnose sturgeon in the area of direct and indirect project influence and the Santee-Cooper River Basin. Consequently, the current schedule for the EIS and license review may need to be reexamined to ensure diadromous fishery resources are adequately addressed. (0021-9 [Croom, Miles])

**Response:** *The review team recognizes the efforts made by the Federal and State resource agencies and utility companies to restore diadromous fishery resources in the Santee-Cooper River basin with the completion of the Columbia Dam fishway in 2006 and the signing of the Santee River Basin Accord in 2008. The review team is not aware of the presence of diadromous fish populations currently in the vicinity of the VCSNS site; however, if diadromous species [e.g., American shad (*Alosa sapidissima*), blueback herring (*A. aestivalis*), and American eel (*Anguilla rostrata*)] become re-established above Parr Shoals Dam, it is unlikely that the cooling-tower blowdown discharge from VCSNS Units 2 and 3 would impede the upstream/downstream migration of these species to riverine reaches upstream of Parr Shoals Reservoir. This discussion of the potential long-term effects of the proposed action on the protection of the diadromous fish, including the Federally endangered shortnose sturgeon (*Acipenser brevirostrum*), was added to Sections 5.3.2 and 7.3.2 of the EIS.*

**Comment:** Page 2-55, line 17: "... reversing the flow in Parr Reservoir." Net flow reversal would only happen when the pump back flow from the FPSF exceeds the natural downstream flow in the river. (0016-8 [Clary, Ronald])

**Response:** *The commenter is correct. The sentence has been revised in Sections 2.4.2.1 and 9.3.3.5 of the EIS to delete the discussion of the reversed flow in Parr Reservoir.*

**Comment:** 2.4.2.2 Aquatic Resources -Transmission Lines

Pg 2-65, lines 35-36: Information updated in Rev I.



Pg 2-66, Table 2-20: MACTEC 2008 identifies Little amphiantus as a federally protected species, it is not included in either Table 2-20 or Table 2-17

Pg 2-67, 1st paragraph: MACTEC 2008 indicated that the # of stream crossings were estimated (0016-40 [Clary, Ronald])

**Response:** *Little amphianthus (Amphianthus pusillus), also known as pool sprite, is listed in Table 2-17 as being Federally and State threatened in Lancaster and Saluda Counties. No change to the EIS was made as a result of this comment. The updated information regarding the total length of Santee Cooper transmission lines was incorporated into Section 2.4.2.2. Furthermore, the paragraph containing the number of stream crossings was revised to indicate that this was an estimate.*

**Comment:** 5.3.2.2 Aquatic Resources -Transmission Lines, Pg 5-31 lines 25-26: Suggest removing "restricts the use of heavy equipment". MACTEC 2008 does indicate that measures, including implementation of appropriate BMPs, are taken to limit erosion and sedimentation entering nearby streams and water bodies. (0016-50 [Clary, Ronald])

**Response:** *The comment was reviewed as was the supporting reference documentation. The text reflects the documentation provided by the applicant. Therefore, no change to the EIS was made as a result of this comment.*

**Comment:** 2.4.2.2 Aquatic Resources -Transmission Lines: Aquatic resources within the footprint of the final transmission line corridors should be fully characterized through stream and wetland delineations. Field surveys should be conducted to locate any sensitive, rare and threatened species. Wetland habitat types should be fully characterized through field surveys. DNR requests consultation on proper mitigation regarding potential impacts to sensitive, rare and/or threatened species.

2.4.2.3 Important Aquatic Species: See above comments in 2.4.2.2

5.3.2.3. Important Aquatic Species and Habitats: See comments in 2.4.1.3 and 2.4.2.2 (0020-7 [Perry, Robert D.]

**Response:** *The EIS has been revised to include updated information from SCE&G and Santee Cooper about impacts of the transmission lines on resources regulated by the FWS. The FWS will have an opportunity to comment on the updated discussion prior to issuance of a permit by the USACE.*

**Comment:** 2.4.2.1. Aquatic Resources -Site and Vicinity, Broad River: The Review Team determined that there are no habitats present in the project vicinity that can be defined as critical habitat. However, through successful stocking efforts, the Broad River now supports populations of robust redhorse, a fish species that, until its rediscovery in 1991 was understood to have

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become extinct in the 1800s. Robust redhorse was not designated as a federal threatened or endangered species in order that maximum flexibility could be afforded to federal, state, academic and non-governmental conservation efforts. The Endangered Species Act (ESA) encourages creative partnerships between the public and private sectors and governmental agencies to conserve imperiled species and their habitats. Consequently, the Robust Redhorse Conservation Committee (RRCC) was established in 1995 under a Memorandum of Understanding between state and federal resource agencies, private industry, and the conservation community in lieu of listing under the ESA. DNR, as well as SCE&G, is a partner in the RRCC. Since the 1991 discovery, populations of robust redhorse have become successfully reestablished in the Broad and Wateree rivers in South Carolina. Communications from SCE&G indicate support for robust redhorse reintroduction. Therefore, although the robust redhorse was not federally listed, the Broad River is, in essence, critical habitat in that the Broad River is essential for ongoing and successful restoration and conservation of this special fish species. Parr Shoals Dam and the Lower Broad River (the portion of the Broad River below Parr Shoals Dam) also feature prominently in the Santee River Basin Accord (Accord). The Accord is a collaborative restoration effort among utilities (including SCE&G) and federal and state resource agencies to address diadromous fish protection, restoration and enhancement in the Santee River Basin including the Broad River both above and below the Parr Shoals Dam. In addition to its importance as habitat for newly established robust redhorse populations, gravel beds below Parr Shoals Dam represent a unique habitat in this area of the Broad River and are potentially important spawning habitat for a variety of fish species, including sucker species and American shad. (0020-4 [Perry, Robert D.]

**Response:** *Although the term “Critical Habitat” in this EIS refers to land areas identified as “critical habitat” for species listed as threatened or endangered by the U.S. Fish and Wildlife Service, the staff’s guidance in NUREG-1555, the Environmental Standard Review Plan (NRC 2000) for important habitats also includes “habitats identified by State or Federal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by plant or transmission line operation and maintenance.” As a result of this comment, a description of the Santee River Basin Accord and the efforts to address diadromous fish protection, restoration, and enhancement in the Santee River basin including the Broad River both above and below the Parr Shoals Dam and the importance of this habitat for robust redhorse populations has been added to Section 2.4.2.1 of the EIS.*

**Comment:** DNR also is concerned over adverse impacts to aquatic life associated with the thermal plume into Parr Reservoir. The thermal plume was modeled using the 7Q10 flow to represent extreme drought. Historically, inflow to Parr Reservoir has been as low as 220 cfs. Thermal impacts may be exacerbated during periods of very low or no riverine inflow or when the Fairfield Pumped Storage Facility pumps water from Parr Reservoir to Monticello Reservoir, creating an area of low inflow in the vicinity of the forebay for some indeterminate period. DNR

recommends that thermal impacts be assessed using historic lowest riverine inflow as well as low forebay inflow. (0020-13 [Perry, Robert D.]

**Comment:** Surface water withdrawal impacts and impacts to aquatic species during drought conditions are also a concern. (0023-18 [Mueller, Heinz])

**Response:** *SCE&G has the ability to mitigate the impact of consumptive water use during low-flow periods by using its available water-storage inventory (45,000 acre-feet in Monticello Reservoir) to provide cooling water for VCSNS Units 1, 2, and 3 during low-flow periods and thereby comply with the downstream flow requirements of the Parr Project FERC license. The Parr Project FERC license requires minimum flows from the Parr Shoals Dam into the Broad River. In an effort to protect fishery resources of the Broad River during the striped bass spawning season (March, April, and May) the minimum average daily flow shall be maintained at 1000 cfs or at the average daily natural inflow into Parr Reservoir (less evaporative losses from the Parr and Monticello reservoirs). Throughout the remainder of the year, the minimum average daily flow below the dam shall be 800 cfs or at the average daily natural inflow into Parr Reservoir (less evaporative losses from Parr and Monticello reservoirs). If SCE&G were unable to maintain the minimum operating level of the Monticello Reservoir as required by the FERC license via the pumpback operation of the Fairfield Pumped Storage Facility, SCE&G would curtail or cease operation of VCSNS until water became available. This ensures that downstream impacts from cumulative consumptive use of Units 1, 2, and 3 would be minimized. Sections 5.3.2 and 7.3.2 of the EIS have been revised to include this information.*

**Comment:** [DNR] Staff recently attended a meeting with representatives of SCE&G to discuss thermal impacts from the proposed discharge into Parr Reservoir and the alternative of discharging heated water instead into Monticello Reservoir. Discharging heated water into Parr Reservoir, and hence into the Broad River may compromise restoration efforts for anadromous and diadromous fishes and the rare robust redhorse and therefore does not appear to be the least damaging alternative. Monticello Reservoir was constructed with the purpose of serving as cooling water source for Unit 1, and DNR questions why this alternative is not the preferred alternative. DNR requested and received from SCE&G additional information on the thermal plume in Monticello Reservoir associated with the operation of Unit 1 and recommends further communication with SCE&G regarding the feasibility of this alternative.(0020-18 [Perry, Robert D.]

**Comment:** The Review Team examined the cumulative impact potential of the thermal plume associated with discharging into Parr Reservoir and concluded that the discharge is: "not likely to noticeably affect the biota, water quality or consumptive use of the Parr Hydroelectric Plant." DNR remains concerned regarding the potential impact of the thermal plume into Parr Reservoir and encourages dialog with SCE&G in the evaluation of Monticello Reservoir as an alternative cooling pond to Parr Reservoir and in the evaluation of the thermal plume from the proposed alternative to discharge into Parr Reservoir. (0020-20 [Perry, Robert D.]

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**Response:** As stated in Section 10.2.2, aquatic impacts from VCSNS Units 2 and 3 blowdown to Parr Reservoir would have minimal effects on aquatic organisms due to the design of the multi-port diffuser. Sufficient habitat for motile species is available in Parr Reservoir under all plume conditions to prevent impacts on the various fish species inhabiting or migrating through the reservoir. As discussed in Section 9.4.2.2, the review team considered discharging blowdown from Units 2 and 3 through the Unit 1 discharge canal into Monticello Reservoir; however, the cooling-tower basins for proposed Units 2 and 3 are at an elevation approximately 25 ft below the elevation of Monticello Reservoir. Because the review team determined the operational impacts of the proposed discharge system to Parr Reservoir would be SMALL, the staff identified no advantage to discharging blowdown to Monticello Reservoir but recognized the 25-ft elevation differential as a disadvantage for overall plant efficiency. No changes were made to the EIS as a result of this comment.

**Comment:** 7.3.2.1 Summary of Aquatic Ecology Impacts

The Review Team concludes that: "cumulative impacts from thermal or chemical discharges are also expected to have minimal impacts on aquatic species because dischargers are operating within allowable levels that prevent water-quality degradation."

It should be noted, however, that the state water quality standards allow for a mixing zone or area where waters in the discharge zone may exceed water quality standards. This mixing zone can represent a localized impact to target fish species such as state conservation priority species, recreational fisheries and the robust redhorse. DNR is concerned over thermal and chemical impacts to these target species and other aquatic biota in Parr Reservoir. (0020-21 [Perry, Robert D.]

**Response:** VCSNS Units 2 and 3 will use a closed-cycle cooling system consistent with EPA Phase I regulations. Units 2 and 3 will withdraw water from Monticello Reservoir and return water, minus consumptive loss, to Parr Reservoir. The review team determined the discharge from Units 2 and 3 would not result in a thermal blockage and would not impede upstream or downstream movement of fish. Fish actively avoid areas of unhealthy water temperatures provided there is an escape route. The applicant will obtain an NPDES permit to discharge the blowdown to Parr Reservoir. Because the mixing zone must be in compliance with the NPDES permit and not result in acutely toxic conditions, thermal and chemical impacts on aquatic biota should be localized and minor. No change to the EIS was made as a result of this comment.

**Comment:** In consideration of interagency objectives for fish passage and habitat restoration and for recovery of shortnose sturgeon and Atlantic sturgeon in the Broad River above Parr Dam, the following future project effects on diadromous fishery resources should be fully considered during development of the Final EIS:

Fish Impingement and Entrainment. Water intakes constructed in Parr Reservoir as a component of the proposed V.C. Summer nuclear power units 2 and 3 should include intake

locations and adequate fish screen designs to prevent entrainment and impingement of fish eggs, larvae, juveniles, and adults. Conceptual and final designs for the intake and screening should be coordinated with NMFS to ensure incorporation of adequate fish protection design criteria. (0021-3 [Croom, Miles])

**Response:** *No new intake structures will be installed in Parr Reservoir as part of construction and operation of VCSNS Units 2 and 3. VCSNS Units 2 and 3 will share a common cooling water intake structure approximately 1,250 feet west of the Unit 1 intake facilities on Monticello Reservoir. The new intake facility will be in compliance with EPA Phase I regulations and employ a closed-cycle cooling system. The cooling-water withdrawal rate for Units 2 and 3 will be 7 to 12 percent that of Unit 1 and the through-trash-rack and through-screen-mesh velocity will be less than 0.5 feet per second. Each circulating-water system intake pump will be protected by a debris-exclusion system consisting of a bar screen to trap large debris and a dual-flow traveling screen for fine-debris removal. Section 5.3.2 of the EIS has been revised to include this information.*

**Comment:** In consideration of interagency objectives for fish passage and habitat restoration and for recovery of shortnose sturgeon and Atlantic sturgeon in the Broad River above Parr Dam, the following future project effects on diadromous fishery resources should be fully considered during development of the Final EIS:

Thermal Impacts. The location, design, and operation of the proposed Parr Reservoir reactor-unit cooling water discharge structure should be carefully evaluated to ensure minimal adverse effects on future seasonal upstream and downstream migrations of diadromous fish and their survival in the reservoir. Conceptual and final designs for the outfall should be coordinated with NMFS to ensure adequate design and operation criteria to protect fish are incorporated. (0021-4 [Croom, Miles])

**Response:** *A discussion of the potential impact from the operation of VCSNS Units 2 and 3 on future populations of diadromous fish, including the shortnose sturgeon and the Atlantic sturgeon, as a result of current and future fish restoration efforts has been included in Sections 5.3.2 and 7.3.2 of the EIS. Updated consultation correspondence with NMFS is included in Appendix F of this EIS. Consultation will be completed prior to issuance of the COL.*

**Comment:** The environmental sections of the Final EIS should fully address consumptive water withdrawal, water quality, and hydrological effects from plant operation on aquatic resources, including the aforementioned diadromous fish species and habitats that may become accessible in the future as a result of sturgeon recovery efforts during the full term of the NRC license. (0021-5 [Croom, Miles])

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**Response:** *A discussion of the potential impact from the operation of VCSNS Units 2 and 3 on future populations of diadromous fish species as a result of current and future fish restoration and recovery efforts was added to Sections 5.3.2 and 7.3.2 of the EIS.*

**Comment:** The EIS should analyze the indirect and cumulative effects of water withdrawals, thermal discharges, and radioactive discharges on riverine habitat downstream of the proposed project. (0021-6 [Croom, Miles])

**Response:** *The EIS addresses indirect and cumulative effects of water withdrawals, thermal discharges, and chemical discharges downstream of the proposed plant in Section 7.3.2. Section 7.3.2 of the EIS has been updated. Section 7.8 of the EIS addresses the cumulative radiological impacts of operation of the proposed Units 2 and 3.*

**Comment:** Water intake and consumption impacts on aquatic biota are areas of concern. These impacts are related to the relative amount of water drawn from the Monticello Reservoir (cooling water source), and the potential for small fish and shellfish impingement on the intake screens' or entrainment in the cooling-water system. The DEIS describes the results of studies regarding impingement related to existing Unit 1. Since new intakes will be constructed for Units 2 and 3, increased water intake and consumption will occur.

EPA recommends the applicant use a mesh size for the traveling screens for intake cooling water that is appropriate for the size of eggs, larvae, and juveniles of all fish to be protected at the site. The DEIS states that, for the cooling water intake structure for Units 2 and 3, the *"designed through-screen velocity will be less than or equal to 0.5 feet per second (fps) at a minimum elevation of 414 ft Northern American Vertical Datum of 1988."*

EPA determined that *maximum* design intake screen, velocity should be less than or equal to 0.5 feet per second in order to reduce impingement of fish. Therefore, the DEIS should specifically address whether the maximum designed intake velocity will be less than 0.5 fps. (0023-17 [Mueller, Heinz])

**Response:** *Section 5.3.2.1 addresses potential for impingement and entrainment for operations at VCSNS Units 2 and 3. Sections 3.4.2.1, 5.3.2.1, and 5.3.2.5 of the EIS were revised to state that both the circulating-water system raw-water intake and the water-treatment plant intake associated with proposed VCSNS Units 2 and 3 would have a design through-screen velocity of less than 0.5 fps at a minimum reservoir water elevation of 414.3 ft North American Vertical Datum of 1988 (NAVD88). Sections 9.3.3.5, 9.3.5.5, and 9.3.6.5 of the EIS were also revised to state that cooling-water intakes at alternative sites would have a design through-screen velocity of less than 0.5 fps.*

**Comment:** In addition, stormwater management structures should be designed to prevent introduction of sediments and pollutants into onsite waterbodies and waterways crossed by

transmission-line corridors, in order to avoid injury to aquatic biota. The design and operation of the stormwater systems for the proposed VCSNS Units 2 and 3 must comply with NPDES stormwater regulations administered by the SCDHEC. (0023-20 [Mueller, Heinz])

**Response:** *Prior to initiating soil-disturbing activities, the applicant will obtain the necessary authorizations as identified in Appendix H of the EIS. No changes were made to the EIS as a result of this comment.*

**Comment:** Blowdown from the proposed units will consist of contaminants and toxic materials, including biocides, anti-scaling agents, corrosion inhibitors and algaecides, among others. These contaminants will be further concentrated as water is recycled through the cooling towers. It is not known what impact these contaminants will have on aquatic life in the vicinity of the discharge and how far potential adverse impacts may be carried downstream of the discharge, particularly during periods of low inflow less than the 7Q10. DNR is concerned over the impact of these contaminants to aquatic organisms both in the immediate area of the discharge and downstream. DNR will request consultation with the licensees and the South Carolina Department of Health and Environmental Control in the development of an acceptable water quality monitoring program to assure that water quality in the vicinity of the discharge is not degraded. (0020-12 [Perry, Robert D.]

**Response:** *Pursuant to the Clean Water Act, the EPA has the authority to require water-quality monitoring for physical and/or chemical parameters in the waters of the United States. In South Carolina, the EPA delegates this authority to the SCDHEC. Prior to operation of VCSNS Units 2 and 3, the applicant is required to obtain an NPDES permit from SCDHEC to discharge liquid effluent to a surface-water body; this permit would contain any water-quality monitoring conditions or requirements. Blowdown constituents are regulated by the EPA pursuant to 40 CFR Part 423. No changes were made in the EIS as a result of this comment.*

### E.2.9 Comments Concerning Socioeconomics

**Comment:** [T]he folks who [in this community] haven't really benefited from the taxation of the power plant being in their back yard, because of resources that have never filtered back in the community in terms of infrastructure. (0002-10 [Marcharia, Kamau])

**Comment:** I don't know that you are responsible for what happens, but the mere fact that there are all those people coming here, has an impact on this community, and the quality of life in this community. So I just wanted to express that, and just hope that you are good corporate neighbors, and help us out. We need a recreational center in this community, in conjunction with the County Council, and along with SCE&G, perhaps we could have something to take the kids off the streets, have a place for senior citizens. The only place that we have to meet in this community, now, is either in a church, or the fire station, which is in deplorable condition. So we

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request SCE&G to be a more good corporate neighbor, as possible, and be able to communicate with the community. That is my statement. (0002-12 [Marcharia, Kamau])

**Comment:** SCE&G pays taxes, property taxes to Fairfield County, County Council, Winsboro Town, of approximately 21.2 million dollars, to the best of my knowledge. My interest at the moment is does SCE&G have any input in where that money goes, does it --since it is the major taxpayer, is there any oversight from SCE&G, or better, is there any oversight from the government, other than the town or the county council, overseeing where that amount of tax money is distributed and how those funds are distributed back into Fairfield County? (0002-2 [Schaffer, Jeff])

**Comment:** And then directly across the street from them, they are building a ten to thirty million dollar project with hotels, banks, gas stations, restaurants, houses, car wash, and it generally takes -- you are going to have to have a sewer system. SCE&G is actually building a sewer system, are they going to connect -- what happens, they have a town here that has been incorporated, even though SCE&G don't have anything to do with some of the process specifically, plus they have been somewhat upset that in the 30 years that SCE&G has been here, somewhere in the proximity of 500 million dollars in property taxes have been paid. And if you ride through this community it looks like we are living in the '60s. That is not SCE&G's fault, but the tax money that goes to the local government, then discriminatory in terms of its citizens in this community, not really benefiting from that. (0002-5 [Marcharia, Kamau])

**Comment:** We have a fire station that is dilapidated, fire trucks that have shown up at fires with no water in them. And the County is dragging their feet on putting something up to protect its citizens, like an adequate fire station. Plus they are working on building an adequate medical center. (0002-6 [Marcharia, Kamau])

**Comment:** They are going to pay you all pennies for the property taxes here. And then they are going to take this energy, they are going to send it to North Carolina. And then utilities in North Carolina are going to send it to Virginia. And utilities in Virginia are going to send it further up the East Coast. And where the big tax money is going to come is at the point of consumption. That is where millions will be paid out in taxes, and you folks will be getting pennies. I mean, all you have to do is to look around here now. What has the power plant that you have here, so far, brought to the community? I don't live here, I don't know, maybe it has done you folks an awful lot of good. Think about it, maybe it has, maybe it hasn't, I don't know. (0004-15 [Jocoy, Gregg])

**Response:** *The comments are noted. The economic benefits that could arise during the construction period and the operating period if the project proceeds have been considered in the socioeconomic assessments in Chapters 4 and 5 of the EIS. Oversight of the taxing authorities' decisions regarding the use of tax revenue attributable to the applicant is outside the scope of the environmental review. The review team does not speculate about the implications of new*



*tax revenues for Fairfield County, other than to report that these jurisdictions would receive additional revenues. No change was made to the EIS as a result of these comments.*

**Comment:** Infrastructure, so many people are coming here to work, like 7,000 people will be coming here to work. SCE&G decided, also, just put in a request to build a water treatment facility plant. (0002-4 [Marcharia, Kamau])

**Response:** *Impacts of plant construction and operation on the use of existing local infrastructure, including transportation networks, emergency services, and other community services or the need for such new infrastructure, have been addressed in Chapters 4 and 5 of the EIS. The comment provides no new information and no change has been made to the EIS as a result of this comment.*

**Comment:** Our school buses are delayed a half an hour, sometimes 45 minutes, because we have traffic drive in just two lanes out here, and we are talking about 7,000 people coming here. We are talking about housing, we are talking about 7,000 people, and 500 people that have to move here, and they have two children a piece, that is 1,000 kids. Yes, it would be 1000 kids. Is there a contingency for a new school, a high school, or all the people coming here are not going to come to Fairfield County for whatever reason? (0002-11 [Marcharia, Kamau])

**Response:** *Socioeconomic impacts such as impacts on schools and other local infrastructure associated with the construction and operations have been addressed in Chapters 4 and 5 of the EIS. The NRC concluded that relatively few infrastructure impacts, including impacts on local schools, would be felt in Fairfield County, because most of the workforce would not choose to relocate there, given the options of nearby communities in neighboring counties with well-established services and sufficient infrastructure already in place. No changes were made to the EIS as a result of this comment.*

**Comment:** Page 2-87, line 22: Town of Jenkinsville is now incorporated.  
Page 2-96, line 27: Jenkinsville is now incorporated. (0016-12 [Clary, Ronald])

**Comment:** Page 2-106, line 10: Clarification - Lexington/Richland School District 5 includes portions of Richland County (0016-14 [Clary, Ronald])

**Comment:** Page 4-45 Line 2: Batch plant operated per SCDHEC regulations not SCDNR. (0016-23 [Clary, Ronald])

**Comment:** Page 4-49, line 18: Stagger of unit completion not done to avoid swings in employment levels it is due to power needs. (0016-24 [Clary, Ronald])

**Response:** *These comments are editorial in nature. The EIS was changed to address these comments.*

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**Comment:** EPA notes that job training will be provided to residents. However, many of the VCSNS jobs will require specialized skills, and less than ten percent of the jobs are expected to be filled by the residents in the host county. NRC and the applicant should make every effort to ensure that residents nearby have an opportunity to receive training and compete for those jobs. In addition, efforts to work with and improve schools within the vicinity of the project site should also continue, to ensure that existing and future generations are being prepared to fill those jobs. (0023-26 [Mueller, Heinz])

**Response:** *The NRC's scope under NEPA is to disclose the likely environmental impacts of the proposed action and to evaluate potential alternatives for possible environmental impacts. The NRC does not regulate the interaction of the applicant with its stakeholders, including hiring or training preferences for local residents, community outreach programs (other than safety programs), or other relationships between host communities and power plant site owners and operators. No changes to the EIS were made as a result of these comments.*

**Comment:** Please clarify whether construction activities would have impacts on access to fishing locations, farmlands and hunting areas. (0023-28 [Mueller, Heinz])

**Response:** *Section 4.4.4 of the EIS was modified to address this comment.*

**Comment:** Page 4-56, line 8: How is the stated capacity of Monticello Reservoir derived? This appears to be referring to potable water capacity. (0016-25 [Clary, Ronald])

**Response:** *Information requested in the comment has been clarified in Section 4.4.4.4 of the EIS.*

### E.2.10 Comments Concerning Environmental Justice

**Comment:** I live here in Jenkinsville very close to the plant now and to bring two more site here would not be fair to the people that live in this area. Please [construct?] it somewhere else that would not affect the people in route are like little Jenkinsville. (0010-1 [Gay, Karen])

**Comment:** Message to all interest parties: If nuclear plants are so safe, none will be built in South Carolina and definite not Jenkinsville, South Carolina which is seen as a small ink spot on any USA Map. We have no problem if you put a nuclear power plant in your front or back yard. (0013-4 [Byrd, Verna])

**Comment:** [I]t is clear to me and the citizens of Jenkinsville, South Carolina that you use terms as wildlife, economic environment, no one care about what can happen to us as a people because SCE&G, Santee Cooper nor our State representatives live in Jenkinsville. It is personal interest in the current and future developments. (0014-2 [Byrd, Verna])

**Response:** *These comments express opposition to building new units at the site or to the applicant. They do not provide new information related to the environmental review of the proposed action, and no change was made to the EIS based on these comments.*

**Comment:** EPA commends NRC on the demographics analysis and use of community surveys to obtain information. We also appreciate the inclusion of EJ maps depicting low-income and minority populations within the project area (figures 2-18 and 17). In addition, it would be helpful to include a distance key in the map. (0023-29 [Mueller, Heinz])

**Response:** *A distance key was added to the maps in Figures 2-17 and 2-18.*

**Comment:** According to the DEIS, SCE&G plans to use existing transmission lines and facilities where possible. However, six new transmission lines will be required to connect the new units to the grid, requiring 100-foot widening of some existing transmission corridors and the creation of new transmission line corridors. The EJ section of the DEIS does not include estimates of how many residents this is expected to impact, whether these corridors are in potential EJ areas, or what the anticipated impacts would be. This information should be included in the FEIS. (0023-25 [Mueller, Heinz])

**Response:** *Environmental impacts associated with development and operation of the new transmission lines and rights-of-way following the routes and designs reported by the applicant to the NRC and the USACE are addressed in Chapters 4, 5, and 7 of the EIS. Applicants must consider multiple environmental and economic factors related to land use and other relevant issues when siting and designing transmission lines in accordance with applicable Federal, State, and local regulations. The EIS has been updated to include the most recent information provided by the applicant to the NRC and the USACE for the transmission lines. The discussion of land-use impacts in Sections 4.1, 5.1, and 7.1 of the EIS has been expanded to provide more information about possible impacts of right-of-way development on forestry management and other existing land uses. Sections 4.5, 5.5, and 7.4 of the EIS have been expanded to better characterize environmental justice (EJ) issues associated with the proposed transmission lines. Because the transmission lines would be developed over a relatively homogeneous rural landscape, mostly by using or paralleling existing rights-of-way, the discussion of associated EJ impacts is qualitative.*

**Comment:** The DEIS identified approximately 104 residents living within a mile of the project site. EPA believes it important to meaningfully engage the affected communities within the vicinity of the site throughout this project regarding issues that have the potential to impact them. For example, the DEIS indicates that pre-construction and post-construction noise is expected to peak at 100 dBA 50 ft from the equipment. According to the DEIS, these activities will be intermittent, but during certain periods could be scheduled for 24-hour days, 7 days a week. SCE&G expects that noise levels experienced by sensitive receptive receptors living approximately a mile from the site will rapidly attenuate to below 50 dBA and that continuous

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noise will be lower. The review team also concludes that the noise emanating from the project site could be somewhat muffled to surrounding communities due to the existing topography and the associated impacts would not be significant.

While this may be true, EPA recommends that a community advisory group be established with local residents living within the vicinity of the site, along access roads and transmission corridors. This group should be meaningfully engaged in the decision-making process and informed about the project status and changes. This group should meet periodically with the site management during the development and operation of the proposed project to ensure that issues such as noise, traffic, odor, light, community relations and other issues are appropriately addressed. Project planning should include measures to avoid noise and other community impacts to the extent feasible, and to monitor and mitigate unavoidable community impacts. Community involvement is especially important given that the pre-construction and construction phases will take over ten years to complete, some of the activities will be conducted day and night, seven days a week and could potentially result in adverse community impacts. The FEIS should clarify whether a community advisory group currently exists, whether complaints have been received from the community regarding the existing facility, and how those issues have been addressed. (0023-24 [Mueller, Heinz])

**Response:** *The NRC's scope under NEPA is to disclose the likely environmental impacts of the proposed action and to evaluate potential alternatives for possible environmental impacts. The NRC does not regulate the interaction of the applicant with its stakeholders, including hiring or training preferences for local residents, community outreach programs (other than safety programs), or other relationships between host communities and power plant site owners and operators. No changes to the EIS were made as a result of these comments.*

**Comment:** Clarification is needed in the FEIS regarding EJ information. The DEIS examines demographics within Fairfield, Newberry, Lexington, and Richland Counties, as well as the environmental and socioeconomic impacts to minority and low-income populations up to 50 miles from the VCSNS site. Using 2000 Census Data, the DEIS estimated there were 240 block groups with minority populations that exceeded the state or county average by 20% or greater, and 217 block groups with minority populations of 50 percent or greater. In addition, 54 block groups contained low-income populations that exceeded the state or county average by 20% or greater, 14 of these block groups include minority populations of 50% or greater.

The DEIS also examined EJ populations within six miles of the VCSNS site and identified three African American block groups within the area, using Census data. However, non-EJ block groups do not appear to have been identified in this vicinity. Low-income populations were also identified within the six-mile area following discussions with local officials. Based on these findings, additional assessment of the proposed project impacts on these EJ populations were conducted. The details of this data should be discussed in more detail in the FEIS, clarifying the

methodology of the data obtained from discussions with local officials, and whether these populations may be particularly affected by this project. (0023-23 [Mueller, Heinz])

**Comment:** In addition, the FEIS should include a discussion of the impacts of the sanitary waste treatment facility, including potential impacts on the community, clarifying whether there could be EJ impacts resulting from effluent discharging to any of the potential discharge locations. The FEIS should also clarify the basis for the conclusion that subsistence fishing, hunting and gardening would not be impacted by the project. Please clarify whether construction activities would have impacts on access to fishing locations, farmlands and hunting areas. (0023-27 [Mueller, Heinz])

**Response:** *These comments seek additional detail in reference to the scoping and outreach activities undertaken to identify and research the practices of EJ populations, beyond the initial census data analysis. The review team conducted field reconnaissance visits to the vicinity of the VCSNS site and documented its visits in a trip report cited as a reference in Section 2.6 of the EIS. The trip report, in concert with an informal survey conducted by community residents and entered as scoping comments, records observations of and by the local residents. These observations of local characteristics and practices led the review team to its conclusions regarding EJ populations. Citations and references to the trip report and the community survey have been added to Section 2.6 of the EIS.*

**Comment:** There was no discussion in the socioeconomic or EJ section of the DEIS regarding potential utility rate increases for area residents, and resulting potential impacts on low-income and minority populations. This issue should be discussed in the FEIS. (0023-27 [Mueller, Heinz])

**Response:** *The purpose of the EIS is to disclose the potential environmental impacts of constructing and operating the proposed Units 2 and 3. Setting retail power rates is outside the NRC's regulatory purview; those determinations are the responsibility of the Public Service Commission of South Carolina. Because of the dynamic nature of the rate-setting process, including the uncertainty as to how any increase would be distributed between residential, commercial, and industrial customers, analyzing the likelihood and magnitude of future rate changes (if any) would entail undue speculation by the review team. The EIS was not modified as a result of these comments.*

### **E.2.11 Comments Concerning Historic and Cultural Resources**

**Comment:** Our office concurs with the findings of the draft EIS, particularly the development of management plans to administer cultural resources on the V.C. Summer Nuclear Plant site. We also concur that transmission lines associated with the site may have impacts on historic properties, but that these impacts are not known at this time. We concur that SCE&G and Santee Cooper should work with both our office, the Corps of Engineers, and any associated

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tribes or other interested parties to develop a management plan or programmatic agreement to address potential effects related to the proposed transmission lines. (0001-1 [Dobrasko, Rebekah])

**Comment:** We appreciate the thorough discussion of cultural and historic resources in the DEIS. The DEIS states that SCE&G has agreed to enter into a management agreement with the SHPO to formalize avoidance and protective measures in response to the SHPO's request for a Programmatic Agreement. We also note SCE&G's cultural resources awareness training and inadvertent discovery procedure training for staff working at the site. Consultation between SCE&G and the SHPO regarding the management agreement is ongoing, and the FEIS should include an update of these coordination activities. (0023-22 [Mueller, Heinz])

**Response:** Sections 4.6 and 5.6 were modified to include the State Historic Preservation Office's (SHPO's) concurrence with the findings in fulfillment of the NRC's National Historic Preservation Act (NHPA), Section 106 requirements. In addition, since the publication of the draft EIS, the USACE has become a signatory on the management agreements between SCE&G and the SHPO and between Santee Cooper and the SHPO. Sections 4.6 and 5.6 of the EIS were modified to include this information.

**Comment:** Based on the recommendations to fence and avoid known historic properties and to develop management plans or programmatic agreements to address the indirect and unknown effects of transmission line construction, our office concurs with the NRC's determination that the proposed license should have no adverse effect on historic properties. (0001-2 [Dobrasko, Rebekah])

**Response:** Sections 4.6 and 5.6 were modified to include the SHPO's concurrence with the finding of "no adverse effect" in fulfillment of the NRC's NHPA, Section 106 requirements.

**Comment:** 9.3.3.8 [9.3.4.8, 9.3.5.8, 9.3.6.8] Historic and Cultural Resources

Pg 9-80, line 28: change to the following "... staff assumes SCE&G and Santee Cooper would conduct their transmission-related... "

Pg 9-115, lines 21-23: Identical comment as pg 9-80, line 28 above.

Pg 9-153, lines 18-21: Identical comment as pg 9-80, line 28 above.

Pg 9-189, lines 31-33: Identical comment as pg 9-80, line 28 above. (0016-61 [Clary, Ronald])

**Response:** Sections 9.3.3.7, 9.3.4.7, 9.3.5.7, and 9.3.6.7 of the EIS were modified to address this comment.

**Comment:** 2.7.3 Historic and Cultural Resources within Transmission-Line Corridors, Pg 2-130, line 6: Need to indicate Santee Cooper transmission lines have been routed primarily within existing corridors and reference MACTEC 2008. (0016-41 [Clary, Ronald])

**Comment:** 2.7.3 Historic and Cultural Resources within Transmission-Line Corridors: Pg 2-130, line 19: incorrectly references Santee Cooper, should be SCE&G  
Pg 2-130, line 26: Santee Cooper will comply with requirements necessary for Section 106 compliance and SCSHPO concurrence for the project as implemented by the SCSHPO agreement. (0016-63 [Clary, Ronald])

**Response:** *Section 2.7.3 of the EIS was modified to address these comments.*

## **E.2.12 Comments Concerning Meteorology and Air Quality**

**Comment:** Page 2-135, line 9: The DEIS states "when the water in the reservoir is warmer than the surrounding land and the winds are blowing from the water towards the Unit 1 tower", however, when water is warmer than the land, the air rises, causing the wind to blow from the Unit 1 tower (i.e. land) *towards* the water. (0016-16 [Clary, Ronald])

**Response:** *When weather conditions are quiescent, the temperature difference between the land and water can give rise to a local circulation pattern, a lake breeze (as described in the comment), that affects atmospheric stability and, consequently, the ability of the atmosphere to mix and dilute constituents. The magnitude of the lake breeze is related to a number of factors, including the size of the lake. The conditions described in the EIS can occur when weather patterns are moving through the area. Therefore, no changes were made to the EIS.*

**Comment:** Page 7-26, line 22, 26 & 30: Parr Steam Plant was decommissioned. The appropriate term for the facility is Parr Combustion Turbines.  
Page 7-29, line 35: Parr Steam Plant was decommissioned. The appropriate term for the facility is Parr Combustion Turbines. (0016-34 [Clary, Ronald])

**Response:** *References to the Parr Steam Plant have been removed from EIS. The Parr Combustion Turbines are listed on their Part 70 Air Quality as the Parr Combustion Facility, therefore the name Parr Combustion Facility has been used in the EIS.*

**Comment:** EPA recommends that the discussion of mitigation in the FEIS consider opportunities to reduce Greenhouse Gases (GHGs) and other air emissions during construction and operation of the facility. Specifically, energy efficiency should be a consideration in the construction and operation of facility buildings, equipment, and vehicles. Equipment and vehicles that use conventional petroleum (e.g., diesel) should incorporate clean diesel technologies and fuels to reduced emissions of GHGs and other pollutants and should adhere

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to anti-idling policies to the extent possible. Alternate fuel vehicles (e.g., natural gas, electric) are also possibilities. (0023-7 [Mueller, Heinz])

**Comment:** Carbon dioxide (CO<sub>2</sub>) builds up in the atmosphere over time from emissions from many global sources and has a relatively long atmospheric lifetime (50-200 years). As such, we believe that the DEIS's rationale for not taking reasonable actions to minimize GHG emissions where possible at all phases of the project (i.e., the small size of the plant's construction and operation GHG emissions to total U.S. annual GHG emissions) is not warranted. (0023-9 [Mueller, Heinz])

**Response:** *The EIS text in Sections 4.7.1, 4.7.2, and 5.7.2 was modified to address mitigation measures that could reduce GHG emissions during construction and operation of the facility.*

**Comment:** We disagree with the Review Team's conclusion in Section 7.6.2 that "... *the national and worldwide cumulative impacts of greenhouse gas emissions are noticeable but not destabilizing.*" Since this conclusion is not in agreement with assessment literature on climate change science, we recommend that this statement be appropriately revised in the FEIS. As the DEIS notes in Section 2.9.1 "... *EPA determined that potential changes in climate caused by greenhouse gas (GHG) emissions endanger public health and welfare (74 FR 66496).*" (0023-8 [Mueller, Heinz])

**Response:** *On December 15, 2009, the Administrator of the EPA issued (74 FR 66496) her determination under her authority under the Clean Air Act that:*

*... greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.... The Administrator reached her determination by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change.*

*In addition to the finding, the bases for the finding provide insights into the extensive efforts within the Federal government to weigh and balance science and public policy issues when considering GHG emissions and the effects of climate change; GHG emissions are treated as a surrogate for the potential effects on climate. The following excerpted text from EPA's determination was considered by the NRC staff in shaping its consideration of GHG emissions and the effects of climate change as part of its NEPA reviews of new reactor applications and its preparation of draft EISs:*

- *The Administrator recognizes that human-induced climate change has the potential to be far-reaching and multidimensional, and in light of existing knowledge, that not all risks and potential impacts can be quantified or characterized with uniform metrics.*



- *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public health by evaluating the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food- and water-borne pathogens, and changes in aeroallergens.*
- *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife.*
- *The Administrator is defining the air pollutant that contributes to climate change as the aggregate group of the well-mixed greenhouse gases. The definition of air pollutant used by the Administrator is based on the similar attributes of these substances. These attributes include the fact that they are sufficiently long-lived to be well mixed globally in the atmosphere, that they are directly emitted, and that they exert a climate-warming effect by trapping outgoing, infrared heat that would otherwise escape to space, and that they are the focus of climate change science and policy.*
- *The release of the U.S. Global Climate Research Program (USGCRP) [formerly the Climate Change Science Program (CCSP)] report on impacts of climate change in the United States in June 2009 ... synthesized information contained in prior CCSP reports and other synthesis reports, many of which had already been published ... [and undergo a rigorous and exacting standard of peer review by the expert community, as well as rigorous levels of U.S. Government review and acceptance.... The review processes ... provide EPA with strong assurance that this material has been well vetted by both the climate change research community and by the U.S. Government.]. These assessments therefore essentially represent the U.S. Government's view of the state of knowledge on greenhouse gases and climate change. For example, with regard to government acceptance and approval of IPCC [Intergovernmental Panel on Climate Change] assessment reports, the USGCRP website states that: "When governments accept the IPCC reports and approve their Summary for Policymakers, they acknowledge the legitimacy of their scientific content." It is the Administrator's view that such review and acceptance by the U.S. Government lends further support for placing primary weight on these major assessments.*
- *EPA has no reason to believe that the assessment reports do not represent the best source material to determine the state of science and the consensus view of the world's scientific experts on the issues central to making an endangerment decision with respect to greenhouse gases. EPA also has no reason to believe that putting this significant body of work aside and attempting to develop a new and separate assessment would provide any*

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*better basis for making the endangerment decision, especially because any such new assessment by EPA would still have to give proper weight to these same consensus assessment reports.*

*The latter represents an endorsement by the EPA of the USGCRP or Karl Report (Karl et al. 2009). The review team's assessment that the current affected environment (either in Chapter 2 for the site region or in Chapter 7 for the alternative sites) reflects conditions with the NRC's impact category level of MODERATE for air quality related to GHG, noticeable, but not destabilizing, is entirely consistent with the EPA Administrator's finding. If the Administrator determined that an immediate action was necessary to improve public health conditions in the affected environment, for example, the closure of GHG-emitting facilities, then the review team may have considered an impact category level more reflective of a destabilized environment. No changes were made to the EIS text as a result of this comment.*

**Comment:** The DEIS concludes that nuclear power results in significantly lower CO<sub>2</sub> emissions than coal or natural gas-fired generation. To the extent that this particular facility will result in lower emissions than a given alternative, EPA recommends that the discussion state that lower CO<sub>2</sub> emissions overall would result in lower climate change risks.

(See CEQ's Draft NEPA Guidance on Consideration of the Effects of Climate Change and GHGs: <http://www.whitehouse.gov/sites/defaultfiles/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf>, which discusses the uses of GHG emission levels as a reasonable proxy for potential climate change impacts.) (0023-10 [Mueller, Heinz])

**Response:** *The NRC remains vigilant of emerging environmental issues, regulatory approaches, and analytical methods that may inform its decisions. The review team relied heavily upon the work of other agencies in the Federal family, especially those with a direct mandate to address the science and the effects of climate change on public health and welfare; now that the U. S. Government position has crystallized, the review team believed that it was important to consider the new circumstances. As a starting point, on December 15, 2009, the Administrator of the U.S. Environmental Protection Agency (EPA) issued (74 FR 66496) her determination under her authority under the Clean Air Act that:*

*... greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.... The Administrator reached her determination by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change.*

*In addition to the finding, the bases for the finding provide insights into the extensive efforts within the Federal government to weigh and balance science and public policy issues when*

considering GHG emissions and the effects of climate change; GHG emissions are treated as a surrogate for the potential effects on climate. Several of the germane findings included:

- *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public health by evaluating the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food- and water-borne pathogens, and changes in aeroallergens.*
- *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife.*
- *... with regard to government acceptance and approval of IPCC [Intergovernmental Panel on Climate Change] assessment reports, the USGCRP Web site states that: "When governments accept the IPCC reports and approve their Summary for Policymakers, they acknowledge the legitimacy of their scientific content." It is the Administrator's view that such review and acceptance by the U.S. Government lends further support for placing primary weight on these major assessments.*
- *EPA has no reason to believe that the assessment reports do not represent the best source material to determine the state of science and the consensus view of the world's scientific experts on the issues central to making an endangerment decision with respect to greenhouse gases. EPA also has no reason to believe that putting this significant body of work aside and attempting to develop a new and separate assessment would provide any better basis for making the endangerment decision, especially because any such new assessment by EPA would still have to give proper weight to these same consensus assessment reports.*

*The latter represents an endorsement by the EPA of the USGCRP or Karl Report (Karl et al. 2009). The Council on Environmental Quality draft guidance regarding climate change as an element of the NEPA review has been considered by the NRC staff in crafting its approach for developing EISs for new reactor applications. While it is important to disclose the comparison of GHG emissions among the proposed project and its alternatives, the conclusion that lower GHG (or CO<sub>2</sub>-equivalent) emissions would result in lower climate change risks from this action is too broad a conclusion to state without more detailed analysis. A more detailed analysis to support such a conclusion was not warranted for this NEPA review. Appendix J presents the review team's estimate of the CO<sub>2</sub> footprint of the nuclear power generation alternative. The*

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*comparison of CO<sub>2</sub> footprints of nuclear power and alternatives is presented in Section 9.2.5. No change to the EIS was made as a result of this comment.*

**Comment:** Section 6.1.3 describes 5.3E+ 7 metric tonnes of CO<sub>2</sub>(total carbon footprint including construction, 40 year lifespan, and decommissioning) for the fully operating plant as small for a carbon footprint for a facility with three reactors. That said, the carbon emissions associated the fossil fuel-based enrichment of uranium alone are actually quite comparable to the emissions of a smaller size fossil fuel-based power plant.

For example, assuming this project has a uranium fuel cycle footprint (as stated in Appendix J) of 1.4E+07 (for a 40 year lifespan for one reactor), such emissions are comparable to those exhibited by smaller coal fired power plants in South Carolina in 2007, (assuming the 2007 year emissions are comparable from year to year for 40 years). Specifically, in 2007 the emissions for the highest and lowest emitting coal plants were:

- Plant Cross (highest C02 emitter in 2007): (1.2E+07 MT C02/y)(40y) =4.8E+08 MT C02.
- Plant Dolphus M. Grainger (lowest C02 emitter in 2007): (8.9E+05 MT C02/y)(40y) =3.6+07 MT C02

[Reference: America's Biggest Polluters, Carbon Dioxide Emissions from Power Plants in 2007. Environment America Research and Policy Center. November 2009. <http://www.environmentamerica.org/home/reports/report-archives/global-warming-solutions/global-warming-solutions/americas-biggest-polluters-carbon-dioxide-emissions-from-power-plants-in-2008>].

The emissions associated with the lower end of this range (3.6E+07 MT CO<sub>2</sub>) are comparable to the 40 year emissions of just one nuclear reactor (1.4E+07). When additional reactors are included, the plant's carbon footprint will be even more comparable to that of a smaller coal-fired plant. Thus, the DEIS statement in Section 9.2.4 that "*Among the viable energy-generation alternatives, the C02 emissions for nuclear power are a **small fraction** of the emissions of the other viable energy generation alternatives*" [emphasis added] does not convey an accurate picture of the full lifecycle C02 emissions of the nuclear generation process. (0023-30 [Mueller, Heinz])

**Response:** *The comparison provides useful descriptive information, but it does not address the specific information needed to inform the decisionmaker(s) on the NEPA action. First, the scaling discussion in Section 6.1 is for the action, i.e., two new reactors, in close proximity to the existing VCSNS Unit 1. Unit 1 is not part of the action, but is considered in the cumulative effects evaluation because it is already included in the affected environment and it is expected to continue to operate during the period covered by this action. Second, the scaling discussion includes consideration of the capacity factor, not just the "nameplate" rated power level, to account for the actual time the units are expected to operate. Consequently, the review team*

*does not agree entirely with the EPA comments. The EPA assessment was based on the total emissions and did not consider energy produced or plant capacity factor. According to emissions data in the report cited above, the emissions rate for Plant Cross is 1.005 tons of CO<sub>2</sub> per MWh, and the emissions rate for Plant Dolphus M. Grainger is 1.055 tons per MWh. Neither emission rate is the highest or lowest in South Carolina. In fact, the average emission rate for coal-fired generation in South Carolina is 0.975 tons of CO<sub>2</sub> per MWh. When this average emission rate is scaled to provide power comparable to the two proposed VCSNS units, the total emission for 40 years would be about  $7 \times 10^8$  tons of CO<sub>2</sub>. These emissions are only for plant operation and do not include the indirect emissions of the coal fuel cycle.*

*The proposed action involves baseload electrical power generation. Insofar as certain energy alternatives do not meet the purpose and need for the action (i.e., they are not considered baseload), they need not be considered at the same level of detail as the baseload power generators. The long-term effects of GHG emissions among the energy alternatives is focused on the operational impacts discussed in Section 9.2.5. The review team also considered the environmental air quality effects from the fuel cycle and from worker transportation GHG emissions over the operating life of the facility. The review team did not consider analogous fuel cycle and worker GHG emissions from the other viable baseload energy alternatives because they would not alter the review team's conclusions.*

*Appendix J presents the review team's estimate solely of the CO<sub>2</sub> footprint of the nuclear power generation alternative; a discussion of other energy alternatives in Appendix J would not be consistent with the purpose of the appendix. The comparison of CO<sub>2</sub> footprints of nuclear power and alternatives is presented in Section 9.2.5. Expanding the comparison of the CO<sub>2</sub> footprint of nuclear power and energy alternatives would be an academic exercise that does not serve the purpose of NEPA because the review team determined that the renewable generation alternatives would not meet the proposed action's purpose and need for baseload power generation.*

*In taking the additional step to inform the decisionmaker(s) that, even accounting for the transportation of the power plant operating and for the fuel cycle impacts (starting with the mining of the resource), the review team concludes that the operational impacts are significantly lower than the emissions for any of the other alternatives; including a discussion of the emissions from, for example, coal mining, handling, transportation, waste management, etc. does not change the conclusion. Finally, as noted in Section 6.1 of the EIS, recent changes in the uranium fuel cycle would further reduce the fuel cycle CO<sub>2</sub> footprint below the bounding value given in the EIS. On these bases, the review team considered these comments, but they did not result in any changes to the EIS.*

**Comment:** We also note that Section 6.1.3 states "In Appendix J, the staff estimates that the carbon footprint of the fuel cycle to support a reference 1000-MW(e) LWR for a 40-year plant life is on the order of  $1.8 \times 10^8$  TMT of CO<sub>2</sub>" while Appendix J lists this value as  $1.4 \times$

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10<sup>7</sup> MT of CO<sub>2</sub>. Also, the CO<sub>2</sub> footprint for decommissioning stated in Section 6.3 does not match the values given in Table J-3. (0023-31 [Mueller, Heinz])

**Response:** *The review team did update the Table J-3 estimate from the Uranium Fuel Cycle to be 1.7 x 10<sup>7</sup> MT and the Total to be 1.8 x 10<sup>7</sup> MT, consistent with NRC staff guidance on the evaluation of GHG emissions; this update was also addressed in Section 9.2.5.*

### E.2.13 Comments Concerning Health – Nonradiological

**Comment:** Page 2-141, line 4: Delete reference to discharges into the circulating water system. There are no discharges to this closed system, but rather to Monticello and Parr Reservoirs. (0016-17 [Clary, Ronald])

**Response:** *Section 2.10 of the EIS was corrected to clarify that thermal discharges would be to Parr Reservoir.*

**Comment:** Pg 5-57 lines 29-30: MACTEC 2008 also states that Santee Cooper transmission lines will meet or exceed the requirements of the NESC (currently less than 5mA). (0016-51 [Clary, Ronald])

**Response:** *Section 5.8.3 of the EIS was modified to add that Santee Cooper transmission lines also meet or exceed National Electrical Safety Code (NESC) requirements.*

### E.2.14 Comments Concerning Health – Radiological

**Comment:** So the cumulative impacts. South Carolina is the most nuclear power reliant state in the southeast, and the third most reliant in the country, with about 58 percent of its energy produced by nuclear power. Further, a host of nuclear waste and nuclear industrial operations are here in South Carolina. The Savannah River Site Nuclear Weapons Complex, near Aiken, is the most radioactive Department of Energy site in the nation. The Barnwell radioactive waste nuclear dump is also a radioactive hot spot. Nowhere in this impact statement does it discuss the cumulative impacts of having all of these nuclear facilities operating in North Carolina, or the cumulative health impacts on Carolinians. The NRC must address these cumulative impacts to water sources and human health. It is to make a truly informed decision on adding two more reactors into this already radioactive mix. (0003-12 [Hancock, Mandy])

**Comment:** South Carolina is the most nuclear power reliant state in the Southeast and the third most reliant in the country, with about 58% of its electricity produced by nuclear power. Further, a host of nuclear waste and nuclear industrial operations are here in South Carolina. The Savannah River Site nuclear weapons complex near Aiken is the most radioactive Department of Energy site in the nation. The Barnwell radioactive waste nuclear dump is also a radioactive hot spot. Nowhere in the DEIS does it discuss the cumulative impacts of having all

these nuclear facilities operating in South Carolina or the cumulative health impacts to Carolinians. The NRC must address these cumulative impacts to water resources and human health if it is to make a truly informed decision on adding two more reactors into this already radioactive mix. (0017-10 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The comments concern the cumulative impacts of other nuclear facilities in the vicinity of proposed VCSNS Units 2 and 3. Section 7.8 of the EIS presents an assessment of the cumulative radiological impacts from nuclear facilities within the 50-mi radius of the VCSNS site. The Barnwell facility, the Savannah River Site, the mixed-oxide fuel plant, and many of the other energy projects listed in Table 7.1 are outside of the 50-mi radius. The EIS was not modified as a result of these comments.*

**Comment:** And I'm concerned that they try to equate medical, which I'm not discounting, but I'm not sure that you can equate medical radiation with constant doses of cesium, and strontium, and other kinds of radioactive isotopes that come out of a reactor. (0004-6 [Corbett, Susan])

**Response:** *The comment concerns exposure of the U.S. population to various sources of radiation listed in Table 6-2. Table 6-2 puts different kinds of radiation exposure on an equal footing by expressing the exposures in a quantity called total effective dose equivalent (TEDE). TEDE accounts for different kinds of radiation and their effects on the body. The EIS was not modified as a result of this comment.*

**Comment:** This fact sheet on biological effects of radiation is an insult. It is an effort to make us look stupid, because we are asking about radiation. Radiation is all around you. We are not stupid, we know better. (0004-18 [Jocoy, Gregg])

**Response:** *The comment concerns a NRC fact sheet that is available to the public; the fact sheet is not part of the EIS. The EIS was not modified as a result of the comment.*

**Comment:** Speaking of water, downstream the environmental releases from the existing reactor can be measured. Every day I'm drinking contaminated, tritiated water that comes from these reactors. In the Environmental Report for the year 2009, from SCE&G, and this is just the cover, it documents that tritium, which is created during reactor operation, can be measured at the Columbia water intake. It is below the Environmental Protection Agency standards, but it is approaching 25 percent of the standard that is now applied in Europe. I think the standard here is too high. So I would like to see an analysis of the impact of the two additional reactors on downstream tritium discharge, as well as other radioactive isotopes that are mentioned in the SCE&G environmental report. (0004-46 [Clements, Tom])

**Response:** *The comment concerns tritium releases from existing VCSNS Unit 1, and potential tritium releases from proposed Units 2 and 3. The expected radiation doses to the public from*

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*all radioactive effluents, including tritium, from proposed Units 2 and 3 are addressed in Section 5.9 and Appendix G of the EIS. Section 5.9 and Appendix G also address the expected combined radiation doses from operation of all three units; these estimates include tritium. As discussed in Section 5.9 of the EIS, these doses are all well below the radiation dose standards set by EPA and NRC. The EIS was not modified as a result of the comment.*

**Comment:** We have already withstood the current reactor for 30 years which is still in operation and which will exist forever. Why do you want to put more burdens on us and receive addition chemicals which will shorten our lives even more? A dollar can buy temporary thing, but human lives are priceless. (0013-2 [Byrd, Verna])

**Response:** *The comment expresses concern about potential chemical exposures from the new reactors as well as from the existing reactor. Nonradiological and radiological health impacts of routine operations are evaluated in Sections 5.8 and 5.9 of the EIS. Cumulative nonradiological and radiological health impacts are evaluated in Sections 7.7 and 7.8 of the EIS. The EIS was not modified as a result of this comment.*

**Comment:** How can you label radiation consumptions as small or medium? Any radiation of any kind is large and is subject to harm. (0013-3 [Byrd, Verna])

**Response:** *The comment concerns relative amounts of radiation. The amount of radiation absorbed by a person is called dose, and is measured in millirems. As shown in Table 6-2, the average U.S. resident receives over 300 millirems of dose each year from natural sources of radiation. Doses from routine operations of the proposed Units 2 and 3 are evaluated in Section 5.9 and Appendix G, and are shown to be a few millirems per year for the most highly exposed member of the public, and less than this for everyone else. The EIS was not modified as a result of this comment.*

**Comment:** Page 4-79, line 22: Releases from all of the sources listed are not released from the Unit 1 stack. Example: oil incinerator. (0016-27 [Clary, Ronald])

**Response:** *All gaseous releases from Unit 1 were assumed to occur at ground level. Section 4.9.2 of the EIS was revised to list sources as they appear in SCE&G documents.*

**Comment:** The DEIS references the "DHEC Groundwater and Surface Water Screening Project for Radioactive Constituents around SC Nuclear Power Plants (2009)." The document describes January and July 2008 groundwater and surface water sampling in the vicinity of VCSNS Nuclear Station; 12 samples total. Tritium was detected in two onsite monitoring wells at levels of 519-2,880 picocuries per liter of water (pCi/IL) and in two surface water samples at levels of 248-254 pCi/L. We note that these levels are below the drinking water MCL(20,000



pCi/L as an annual average). The DEIS mentions that the potential source of tritium was the permitted disposal of condensate polisher resin in the area in 1994.

Gross Alpha radiation was detected in two groundwater samples; one of these samples had levels exceeding the EPA safe drinking water MCL of 15 pCi/L (32.8 pCi/L). This well was sampled again on July 24, 2008 and no Gross Alpha radiation was detected in the follow-up analysis. The FEIS should include updated sampling information, if available.

(0023-16 [Mueller, Heinz])

**Response:** *Section 2.11 of the EIS was updated to include 2009 monitoring data for radioactive constituents.*

### **E.2.15 Comments Concerning Nonradioactive Waste**

**Comment:** The DEIS states that SCE&G implemented a waste minimization plan to reduce the amount of mixed waste produced onsite. SCE&G stated "... *the treatment, storage, and disposal of mixed wastes generated by the proposed Units 2 and 3 would be managed as the existing Unit 1 mixed wastes is managed,*" (Volume 1, page 5-76). The document should define how existing Unit 1 mixed wastes are being managed, along with a reference to documentation regarding the procedures of the mixed waste management program. The reference section at the end of Chapter 5 should also include this reference. (0023-4 [Mueller, Heinz])

**Response:** *The comment concerns plans for treatment of mixed waste. Section 5.10.4 of the EIS was revised to define how Unit 1 mixed wastes are being managed, and a reference for the documentation of SCE&G's waste management and minimization procedure was added.*

### **E.2.16 Comments Concerning Accidents – Severe**

**Comment:** I'm very concerned about this, because I'm concerned about an accident, and other things that might happen out here. (0004-1 [Corbett, Susan])

**Comment:** I'm worried about environmental justice because if there was an accident, the bulk of the people who would be impacted by any kind of an accident would be people of lower economic strata, and they would be the ones most impacted. And it would destroy their homes, their land, and their farm land. And it talks about that in the EIS, the land would basically become worthless, and all the crops and things would be destroyed. (0004-5 [Corbett, Susan])

**Comment:** But mainly I'm concerned about an accident, because we have seen, this past month, that what they said could not happen, can always happen. (0004-7 [Corbett, Susan])

**Response:** *The comments concern postulated reactor accidents. The environmental impacts of postulated accidents are addressed in Section 5.11 of the EIS. Tables 5-15, 5-16, and 5-17*

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*of the EIS present estimates of the risk associated with severe accidents. As discussed in Section 5.11 of the EIS, the risks from a severe accident at the proposed reactors are lower than the risk levels set forth in the Commission's Safety Goals Policy statement (51 FR 30028). No change was made to the EIS as a result of these comments.*

**Comment:** Section 5.11.2.4, Estimated Risks of Releases Related to External Events, addresses seismic events, but does not mention the risk of releases due to terrorists attacks such as planes crashing into containment and/or other possible attacks. Risk assessment data for these scenarios should be calculated and described in this section in accordance with NRC guidelines. (0023-6 [Mueller, Heinz])

**Response:** *The comment concerns risks from terrorist attacks. The NRC does not assess the risk or environmental impact of releases of radioactive material that could be caused by terrorist attacks in an EIS. The NRC considers postulation of such attacks to be "remote and speculative" as defined by NEPA. More appropriately, the NRC does evaluate security issues outside the NEPA process. The NRC addresses aircraft hazards and aspects of physical security in its Safety Evaluation Report. With regard to aircraft impacts, NRC regulations (10 CFR 50.150) require a rigorous assessment of the design to identify design features and functional capabilities that could provide additional inherent protection to avoid or mitigate the effects of an aircraft impact. No change was made to the EIS as a result of this comment.*

### E.2.17 Comments Concerning the Uranium Fuel Cycle

**Comment:** Yucca Mountain, the proposed storage facility for radioactive waste, as indicated in the DEIS, is no longer an option and, therefore, there is need to address where the waste will be stored, as it is unaddressed. (0002-14 [Anderson, Russell])

**Comment:** In the light of the risk associated with nuclear waste, O'Brian's example reminds us that the construction of these plants is not acceptable. (0003-15 [Hildebrandt, Lorena])

**Comment:** I'm concerned about the waste, first of all, because we know that we don't have any solution for spent fuel, because Yucca Mountain is not going to open, and they actually talk about it in the EIS, but that is gone now. (0004-2 [Corbett, Susan])

**Comment:** And the spent fuel is probably going to stay here. And I think the last time I came down here I told the community that you are going to get stuck with the spent fuel, probably. (0004-4 [Corbett, Susan])

**Comment:** We here in South Carolina are concerned that we are going to become the nation's dumping ground for nuclear waste because of problems with Yucca Mountain. (0004-41 [Clements, Tom])

**Comment:** Also the Draft Environmental Impact Statement fails to thoroughly discuss what is going to happen to the spent nuclear fuel rods that come out of the reactor. These long assemblies of highly radioactive, highly dangerous material. Right now with the Yucca Mountain storage facility in Nevada pretty much off the table, we don't know what is going to happen to this high level nuclear waste. A commission has been set up to examine it, and it looks like it is going to be long-term onsite storage. And this document does not thoroughly evaluate what the situation would be at the site, here, if the spent nuclear fuel is left for a long period of time. (0004-50 [Clements, Tom])

**Comment:** Appropriate on-site storage of spent fuel assemblies and other radioactive waste is necessary to prevent environmental impacts. The DEIS notes that planning is in progress regarding a repository for high-level and transuranic wastes. However, given the uncertainty regarding ultimate disposal at a repository, on-site storage may continue for a longer term than currently expected. In the Waste Confidence Rule (10 CFR 51.23), the Commission generically determined that the spent fuel generated by any reactor can be safely stored on-site for at least 30 years beyond the licensed operating life of the reactor.

The DEIS states that unavoidable adverse air quality impacts would be negligible, and that pollutants emitted during operations would be insignificant (Volume 1, page 10-11). (0023-5 [Mueller, Heinz])

**Response:** *The comments concern interim storage and ultimate disposal of spent fuel and other high-level radioactive waste. Section 5.9 of the EIS addresses the radiological impacts during operation of the proposed VCSNS reactors including the storage of spent fuel in the spent fuel pool and in the proposed Interim Spent Fuel Storage Installation (ISFSI). Interim storage and ultimate disposal of spent fuel and high-level radioactive waste are discussed in Section 6.1.6 of the EIS. Section 6.1.6 presents Yucca Mountain as an example of a possible of a high-level waste repository; the conclusions in Section 6.1.6 do not depend on whether Yucca Mountain, or another site, is ultimately the destination for spent fuel and high-level radioactive waste. Moreover, as indicated at 10 CFR 51.23(a), "The Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and at either onsite or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent fuel generated in any reactor when necessary." In addition, 10 CFR 51.23(b) applies the generic determination in section 51.23(a) to provide that "no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installations (ISFSI) for the period following the term of the . . . reactor combined license or amendment . . . is required in any . . .*

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*environmental impact statement . . . prepared in connection with . . . the issuance or amendment of a combined license for a nuclear power reactors under parts 52 or 54 of this chapter.” Section 6.1.6 of the EIS has been updated to reflect the current language of the Waste Confidence Decision.*

**Comment:** Furthermore, the temporary on-site storage capacity . . . could result in unquantifiable economic and ecologic issues. (0002-15 [Anderson, Russell])

**Comment:** And, also, Barnwell is going to close in 2038, and they talk about sending the low level waste to Barnwell. Well, I don't know where they are going to put it, because Barnwell is going to close. (0004-3 [Corbett, Susan])

**Comment:** I want to submit a document for the record, that the Draft Environmental Impact Statement doesn't take into account that beginning in the year 2038, that South Carolina Department of Health and Environmental Control is going to begin closing the Barnwell nuclear dump over near Aiken. I want to submit an annual report for the year 2009 that documents that the date is 2038, so about 18 or 20 years after operation, if they keep their rather optimistic schedule, there well could be no place for certain classes of the low level waste to go to. (0004-49 [Clements, Tom])

**Comment:** Barnwell to close in 2038 (referring to a paragraph that appeared in the Chem-Nuclear Site Annual Update 2009, published by SC Department of Health and Environmental Control, December 2009: Phase II Closure will begin when the site [Chem-Nuclear Low-Level Radioactive Waste Management Facility in Barnwell County, SC] stops accepting waste from the Atlantic Compact states. It will begin in 2038 and will last one year.) (0011-1 [Clements, Tom])

**Response:** *The comments concern the closure of the radioactive waste disposal facility near Barnwell, South Carolina, and the interim onsite storage of low-level radioactive waste at the VCSNS site. Section 6.1.6 of the EIS was revised to address these comments.*

### E.2.18 Comments Concerning Transportation

**Comment:** [The] risk associated with transportation of waste are heavy, and could result in unquantifiable economic and ecologic issues. (0002-16 [Anderson, Russell])

**Response:** *The NRC conducted several studies to evaluate the risks associated with the transportation of radioactive material. The NRC issued the Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes, NUREG-0170 (NRC 1977), which was published in 1977, to support the 10 CFR Part 71, Packaging and Transportation of Radioactive Material rulemaking. Based on the NRC staff's recommendations in NUREG-0170, the Commission concluded that the transportation regulations are adequate to protect the public from the risks associated with the transportation of radioactive materials, including spent*

*fuel. NUREG/CR-4829, "Shipping Container Response to Severe Highway and Railway Accident Conditions," (Fischer et al. 1987) and NUREG/CR-6672, "Reexamination of Spent Fuel Shipment Risk Estimates," (Sprung et al. 2000) confirmed that conclusion. No change was made to the EIS as a result of this comment.*

### **E.2.19 Comments Concerning Decommissioning**

**Comment:** Closed nuclear power plants can never be removed. It's a lifetime fixtures. (0014-5 [Byrd, Verna])

**Response:** *The comment concerns decommissioning. Plans for decommissioning are described in Section 6.3 of the EIS. The EIS was not modified as a result of this comment.*

### **E.2.20 Comments Concerning Cumulative Impacts**

**Comment:** Page 7-3, Table 7-1, Project Name column: Parr Steam Plant was decommissioned. The appropriate term for the facility is Parr Combustion Turbines. (0016-31 [Clary, Ronald])

**Comment:** Page 7-5, Table 7-1: SCE&G Combined Site Emergency Operations Facility is now operational. (0016-32 [Clary, Ronald])

**Response:** *Table 7-1 was changed to address these comments.*

### **E.2.21 Comments Concerning the Need for Power**

**Comment:** Part of the basis for building this nuclear power plant is that South Carolina needs the energy, needs the electricity. That is not true. They use the South Carolina Public Service Commission, and this organization, that they don't know who is on the Board of Directors of, or how they are chosen, the South Carolina Public Service Authority, to help them evaluate whether or not these power plants are needed. What they intend to do is they are going to wheel this energy out of the state. (0004-14 [Jocoy, Gregg])

**Comment:** I pointed out that the South Carolina Public Service Commission has certified-licensed two natural gas fired power plants on the Reedy River in Greenville. Neither of them have been built. They rejected an application to build a power plant, a natural gas fired power plant on the Reedy River. They rejected a power plant application in Fort Mill. If there were an actual demand for base load capacity, those power plants, which have already been permitted, would have been being built. This thing is being built because there are huge federal subsidies, tax dollars, going to major corporations. (0004-19 [Jocoy, Gregg])

**Comment:** The South Carolina Public Service Commission rejected a proposal Natural Gas fired power plant in Greenville County. It sat on an application to build a combined cycle Natural

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Gas power Station in York County for months until the applicant withdrew the application. Two other plants in Greenville County were permitted but not built. If there were an actual need for more base load capability these two permitted power plants would have been built. (0007-1 [Jocoy, Gregg])

**Response:** *Affected States or regions may prepare a need-for-power analysis and assessment of the regional power system for planning or regulatory purposes. A need-for-power analysis may also be prepared by a regulated utility and submitted to a regulatory authority, such as a State Public Utility Commission. However, the data may be supplemented by information from other sources. When another agency has the regulatory authority over an issue, the NRC defers to that agency's decision. The NRC staff reviews the need-for-power analysis to determine if it is (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. If the need-for-power analysis is found to be acceptable based on these four criteria, no additional independent review by the NRC is needed. The need-for-power analysis that SCE&G provided for its application to the State of South Carolina for a Certificate of Public Convenience and Necessity (CPCN) was approved by the State. Further, the resource plan offered by Santee Cooper, which includes maintaining the ability to expand generating resources, was approved by the Board of Directors of the South Carolina Public Service Authority (SCPSA). In Chapter 8 of the EIS, the NRC staff reviewed the need-for-power analysis submitted, including the findings of the State of South Carolina as part of the hearing record, and determined that the need-for-power analysis submitted was (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. Because the need-for-power analysis was found to be acceptable, no additional independent review by the NRC was needed. Specific to the comment offered, the Greenville County Power project was denied by the Public Service Commission of South Carolina (PSCSC) due to uncertainties in the environmental impacts associated with water and air, and offered no judgment on the need for additional capacity (Docket No. 2001-411-E). The Palmetto Energy Center project was withdrawn from the PSCSC by the applicant for unknown and unstated reasons (Docket No. 2001-507-E). The Greenville Generating Company was provided a certificate to proceed with its project (Docket No. 2000-558-E); the technology selection in that case was for simple cycle combustion turbines, which are not a viable alternative for the supply of baseload power as described in Section 9.2.2. No change was made to the EIS as a result of these comments.*

**Comment:** The utilities are overestimating capacity needs based on 2006 projections, and the NRC needs to fully evaluate whether the additional generating capacity is truly needed, considering the recent trend in decreased energy demand resulting from the current depressed economy. (0003-6 [Hancock, Mandy])

**Comment:** The utilities are overestimating capacity needs given their reliance on 2006 projections and the NRC needs to fully evaluate whether the additional generating capacity is

truly needed, considering the recent trend of decreased energy demand resulting from the current depressed economy. (0017-5 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The need-for-power analysis used in the applicant's ER was prepared by SCE&G through the Combined Application for the Certificate of Public Convenience and Necessity (Docket No. 2008-196-E) submitted to the PSCSC for evaluation (PSCSC 2008), and Santee Cooper through an annual Integrated Resource Plan (IRP) (Santee Cooper 2008). The CPCN ruling by the State considered the energy forecast offered by the applicant starting in the year 2008. The Board of Directors of Santee Cooper also considered the most recent need-for-power analysis found in its IRP, which provided an energy forecast starting in 2008. When prudent, the NRC staff supplemented these documents with more recent information that could materially affect the proposed need for power such as SCE&G's new Energy Efficiency/Demand-Side Management Program goals and objectives, and Santee Cooper's updated 2009 IRP as provided in letter NND-09-0320 to the NRC dated November 20, 2009 (SCE&G 2009, 2010b). To the extent that this new information would affect the proposed need for power, the NRC staff reviewed the information contained therein, and concluded that even with the new programs and adjusted forecasts, the need for power still exists and that the overall need-for-power analysis is consistent with the stated NRC objective of being (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. Therefore, no changes were made to the EIS as a result of the comment.*

**Comment:** ....we have to live, people do need electricity, you know? And this is an alternative. It may not be the best, it may not be the last, but it is what we are dealing with right now. And rather than get all bent out of shape about it, we can make our comments, but we still have to wake up in the morning and turn the lights on. (0004-25 [Hope, Ron])

**Response:** *The NRC does not establish public policy regarding electric power supply alternatives, nor does it promote the use of nuclear power as a preferred energy alternative. Decisions regarding which generation resources and alternatives to generation to deploy were made by the applicant through least-cost planning and IRPs, and proposed to the PSCSC as a formal part of the proceedings regarding the application for a CPCN. Because the comment generally provides no new information, nor requests clarification regarding a specific question, no changes were made to the EIS.*

**Comment:** 8.1.2 Santee Cooper Relevant Service Area:

Pg 8-4 line 4: Add "approximately" before "30 large industrial facilities ..."

Pg 8-4 lines 7-8: Suggest striking last sentence of this paragraph or change from winter peak demand to summer peak capacity of 6,091 as indicated in RAI response NND-090320 (SCE&G 2009d) (0016-53 [Clary, Ronald])

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**Response:** *The EIS was changed to "29 large industrial customers" to be consistent with the most recent information (NND-09-0320: November 20, 2009). The EIS was changed to include that Santee Cooper maintains 6,091 MW of total summer peak generating capacity.*

### **Comment:**

8.1.4.2 South Carolina Public Service Authority (Santee Cooper)

Pg 8-7 line 27: Add "generation" between "The" and "resource".

Pg 8-7 line 35: Replace "IRPs" with "generation resource plans".

Pg 8-7 line 36: Replace "audits" with "review" (0016-54 [Clary, Ronald])

**Response:** *Section 8.1.4.2 of the EIS was changed from "The resource plan," to "The IRP." The document in question is titled South Carolina Public Service Authority Integrated Resource Plan 2008 (Santee Cooper 2008). As indicated in the previous comment response, the document is titled Integrated Resource Plan; for continuity, the IRP functions to serve both as a generation resource plan (capacity evaluation) as well as to incorporate the necessary goals, objectives, and requirements of the utility including both supply-side and demand-side evaluations. Therefore, the term "IRP" in the EIS was not changed. Section 8.1.4.2 was changed as suggested, from "audits" to "reviews." Auditing implies a financial accounting for accuracy; because the IRP is not a financial document, the "review" of the document is appropriate because it indicates a critical examination for accuracy and correctness.*

**Comment:** 8.1.5 Description of the South Carolina Analytical Process: Pg 8-9 line 26: Add "Resource" between "Generation" and "plan" and capitalize "plan". (0016-55 [Clary, Ronald])

**Response:** *Section 8.1.5 of the EIS was changed to "...the 2008 Santee Cooper IRP through..." to remain consistent with the document title.*

**Comment:** 8.1.5 Description of the South Carolina Analytical Process:

Pg 8-10 lines 5-7: Change sentence to "Santee Cooper's resource planning process includes an independent third-party review, and is subject to the State's approval through issuance of a Board of Directors' resolution. "

Pg 8-10 lines 23 and 24: Change first part of sentence to "Santee Cooper's Generation Resource Plan, which contains the load forecast developed by GDS Associates, was independently..."

Pg 8-10 line 29: Replace "final" with "most recent". (0016-56 [Clary, Ronald])



**Response:** For clarification, the text in EIS Section 8.1.5 to which the commenter referred was changed to "Santee Cooper's resource planning process includes an independent third-party review, and is subject to the State's approval as confirmed through issuance of a Board of Directors' resolution." The change does not materially affect any of the information; it simply clarifies how the resource plan and planning process is subject to confirmation. For clarification, the text in EIS Section 8.1.5 to which the commenter referred was changed to "Santee Cooper's IRP, which contains the load forecast developed by GDS Associates, was independently verified by R.W. Beck...". The change clarifies that GDS Associates was responsible for building the energy forecast that was integrated into the annual plan. For clarification, the text in Section 8.1.5 of the EIS to which the commenter referred was changed to "The most recent IRP was adopted..." to reflect the most recent information reviewed and accepted by the Board of Directors of the SCPSA.

**Comment:** 8.3.2 Santee Cooper

Pg 8-19 line 32: Delete "annually" and replace "forecasts through the IRP" with "generation resource plan"

Pg 8-19 line 33: Delete "both" and replace "of the IRP as well as" with "and".

8.3.2.1 Present and Planned Generating Capacity

Pg 8-20 line 11: Delete "annually" and replace with "periodically"

Pg 8-20 line 24: Delete "annually" and replace with "Periodically" (0016-58 [Clary, Ronald])

**Response:** The comments addressing Section 8.3.2 are largely administrative. The subject text of EIS Section 8.3.2 was reworded to "...the SCPSA reviews the IRP, and formally issues a..." to remain consistent with the naming of the document(s) and review cycle, and to "...indicating its approval of the IRP, and ensuing instructions...." EIS Section 8.3.2.1 was changed to replace "annually" with "periodically" to remain consistent with the review cycle as directed by the State.

**Comment:** [My troubleshooting and verification found ERRORS in:] Lack of understanding of Power Distribution rules and importance of smart grid needs. (0018-4 [Wojcicki, Joe])

**Response:** The issues raised in the comment are related to the physical transmission of electricity and the value of smart grid technologies; as such, they are outside the scope of the EIS and were not considered further.

**Comment:** 8.2.2.1 Factors Affecting Demand, Pg 8-14 lines 25-27: The Santee Cooper 2009 IRP was forwarded as requested but the load forecast model did not account for the potential

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loss of sales to Central as this change was not finalized. The requisite regulatory approvals for the agreement between Central and a supplier other than Santee Cooper are now imminent; therefore, the load forecast is being updated accordingly. The Santee Cooper data in Tables 8-1 and 8-4 will need to be revised based on the updated load forecast. (0016-57 [Clary, Ronald])

**Response:** *Sections 8.2 and 8.4 of the EIS, including Tables 8-1 and 8-4, were revised to address Santee Cooper's updated load forecast.*

### E.2.22 Comments Concerning Alternatives – Energy

**Comment:** Utilities in South Carolina have better ways to meet the region's increasing demand for energy, while protecting our water resources and tackling global warming. Investing more resources in the region, wind, solar, and bioenergy industries, and promoting energy efficiency measures, instead of costly new nuclear power would benefit SCE&G and Santee Cooper, and offer economic development opportunities for the region without draining our water resources or our pocketbooks. The NRC must evaluate these alternatives more thoroughly before allowing SCE&G to commit the billions of dollars, millions of dollars of water, and at least an entire decade to build these reactors, when that time and money could be better spent on less risky, more sustainable solutions. Renewable energy technologies, like bioenergy, solar and wind, are not likely terrorist targets, nor have the capacity, in terms of accidents, to kill thousands of people, or permanently contaminate large land areas. (0003-3 [Hancock, Mandy])

**Response:** *The review team examined energy alternatives as part of its responsibilities to evaluate the environmental impacts of the proposed action. Energy alternatives not requiring new generating capacity, including conservation and demand-side management, are discussed in Section 9.2.1 of the EIS. The review team's evaluation of new generating capacity, including renewable alternative energy sources, are found in Section 9.2.2 and 9.2.3 of the EIS, and describe the potential impacts from these sources in comparison to the proposed action. The review team concluded in the EIS that these technologies used singly or in combination did not represent a reasonable alternative to a large baseload power plant located at the VCSNS site. The water-use impacts of the proposed action are discussed in Sections 4.2 and 5.2 of the EIS. Withdrawal and use of surface water for plant operations are regulated by the South Carolina Department of Health and Environmental Control. No change was made to the EIS as a result of these comments.*

**Comment:** The Draft EIS overlooks Santee Cooper's and SCE&G's excellent wind resources within its service [area]. The Clemson University restoration institute shows that South Carolina is poised to lead the charge toward renewable off-shore wind energy, and its high off-shore wind capacity, and to reap large economic benefits from the manufacture of wind turbines. Wind, solar, clean bioenergy sources, and efficiency, should be fully employed before building expensive and risky nuclear reactors. (0003-5 [Hancock, Mandy])

**Response:** *The review team's evaluation of alternative energy sources, including renewable resources such as solar, biomass, and wind, are discussed in Section 9.2.3 of the EIS. Publicly, the State of South Carolina recognizes the potential to develop wind resources and is actively pursuing its development as evidenced by language provided in South Carolina Act 318 (S.B. A318 Section 3), which committed resources to the Wind Energy Production Farms Feasibility Study Committee. This committee submitted a report to the governor about offshore wind energy development (Wind Energy Production Farms Feasibility Study Committee 2009). In addition, other institutions (public and private) continue to evaluate coastal wind resources as well as other renewable energy resources within the State of South Carolina as discussed in the EIS. However, the review team concluded that, of the energy alternatives reviewed in the EIS, only coal and natural gas, individually, as energy source alternatives are capable and consistent with the applicants objective of providing baseload generation as proposed by the two new nuclear units. The review team also considered a combination of energy sources that could include wind power. However, there are currently no known installations or proposed installations for on-shore or off-shore utility level wind generation projects located within State of South Carolina or in the federally controlled waters off the coast. As reviewed in Section 9.2.3, South Carolina is well positioned to capitalize on biomass based renewable energy resources as well as refuse based energy resources such as landfill gas recovery. Therefore, no changes were made to the EIS as a result of these comments.*

**Comment:** Energy efficiency measures also pose no health or safety risks to the public, save consumer's money, and preserve our water resources. South Carolina utilities have significant sources to tap in these areas as outlined in the recent extensive report *Energy Efficiency in the South*, by Georgia Tech and Duke University, and our *Yes, We Can, Southern Solutions for a National Renewable Standard*. (0003-4 [Hancock, Mandy])

**Comment:** I also don't think that the Draft Environmental Impact Statement has properly analyzed alternatives. Information was accepted from the Public Service Commission, and SCE&G itself, that the project was needed. But there are a lot of reports lately, particularly lately, that go into the dramatic savings and energy that could be made in South Carolina in the southeast. There was a recent report for one, and I will submit this for the record later, prepared by Georgia Tech and Emory University, that South Carolina has huge potential concerning energy efficiency and conservation. (0004-44 [Clements, Tom])

**Response:** *Neither the NRC or the USACE establish public policy regarding electric power supply alternatives, nor do they promote the use of nuclear power as a preferred energy alternative. Decisions regarding which generation sources and alternatives (including energy efficiency, conservation, and DSM portfolios) to deploy were made by the applicant and have been confirmed by regulatory bodies such as State energy planning agencies and public utility commissions. Chapter 8 of the EIS included review of energy efficiency and DSM programs as reviewed by the PSCSC as part of the hearing record for the CPCN, which included SCE&G*

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*DSM programs proposed in June 2009 (PSCSC 2009). The PSCSC recognized that energy efficiency and DSM programs are not viable substitutes for the proposed project. Chapter 9 of the EIS included discussion of energy efficiency and DSM as part of the no-action alternative, and the combination of alternatives. No changes were made to the EIS as a result of this comment.*

**Comment:** Clean Energy Solutions Exist. Utilities in South Carolina have better ways to meet the region's increasing demand for energy while protecting our water resources and tackling global warming. Investing more resources in the region's wind, solar, and bio-energy industries and promoting energy efficiency measures instead of building costly new nuclear reactors would benefit SCE&G and Santee Cooper and offer economic development opportunities for the region, without draining our water resources or our pocketbooks. The NRC must better evaluate these alternatives, including a combination of them, more thoroughly before allowing SCE&G to commit the billions of dollars, millions of gallons of water, and at least an entire decade to building these reactors when that time and money could be better spent on less risky, more sustainable solutions.

Renewable energy technologies, like bio-energy, solar, and wind are not likely terrorist targets nor have the capacity, in terms of accidents, to kill thousands of people or permanently contaminate large land areas. Energy efficiency measures also pose no health or safety risks to the public, save consumers money and preserve our water resources. South Carolina utilities have significant resources to tap in these areas as outlined in a recent extensive report, "Energy Efficiency in the South," by Georgia Tech and Duke University and our 2009 report, "Yes We Can: Southern Solutions for a National Renewable Standard."

Santee Cooper and SCE&G have wind resources within their service territories. The Clemson University Restoration Institute shows that South Carolina is poised to lead the charge toward renewable offshore wind energy with its high offshore wind capacity and to reap large economic benefits from the manufacture of wind turbines. Though offshore wind is mentioned in the DEIS, it is downplayed. Wind, solar, clean bio-energy sources, and efficiency should be fully employed before building expensive and risky nuclear reactors. The NRC should evaluate a combination of these resources as a viable alternative to building new reactors. The NRC is not limited to comparing only wind to nuclear, or only solar to nuclear --- a combination of alternatives is certainly an option the NRC should evaluate. (0017-4 [Barczak, Sara] [Hancock, Mandy])

**Comment:** There are reasonable alternatives in mixed use of renewable resources. And I ask the NRC to, in the final draft, really look more closely into the alternatives. (0003-17 [Hildebrandt, Lorena])

**Response:** *The NRC does not establish public policy regarding electric power supply alternatives, nor does it promote the use of any singular resource as a preferred energy alternative. Decisions regarding which generation sources and alternatives (including energy*

*efficiency and DSM portfolios) to deploy were made by the applicant and regulatory bodies such as State energy planning agencies and public utility commissions. The NRC does not have authority to ensure that the proposed plant is the least costly alternative for providing energy services under any particular set of assumptions concerning future circumstances; that authority and responsibility is, in this case, the role of the PSCSC. Chapter 8 of the EIS included review of energy efficiency and DSM programs as reviewed by the PSCSC as part of the hearing record for the CPCN, which included SCE&G DSM programs proposed in June 2009 (PSCSC 2009). The PSCSC recognized that energy efficiency and DSM programs are useful supplements to generation needs, but they are not viable substitutes for the proposed project. Chapter 9 of the EIS further included discussion of energy efficiency and DSM as part of the no-action alternative, and the combination of alternatives. The review team's evaluation of alternative energy sources, including renewable resources such as solar, biomass, and wind, as well as the combination of alternative energy sources, are discussed in Sections 9.2.3 and 9.2.4 of the EIS. Both SCE&G and Santee Cooper are actively engaged in expanding their alternative (renewable) energy generation portfolios as discussed in Sections 8.3.2.3 and 9.3.2. Further evaluation of alternative energy sources was provided by the State of South Carolina via the hearing record regarding the CPCN (Docket No. 2008-196-E ORDER NO. 2009-104(A) [pp. 26-27]). The review team concluded that of the energy alternatives, or combination of alternatives reviewed in the EIS, only coal and natural gas were capable and consistent with the applicants objective of providing baseload generation by the two new nuclear units as proposed. Therefore, no changes were made to the EIS as a result of these comments. The water-use impacts of the proposed action are discussed in Sections 4.2 and 5.2 of the EIS. No change was made to the EIS as a result of these comments.*

**Comment:** Nuclear power requires more water use than other traditional forms of energy production and significantly more water than energy efficiency measures and clean energy technologies such as solar and wind. (0017-8 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The review team evaluated the proposed projects water use, cooling-system operation, and effluent discharge descriptions and impacts in Sections 4.2 and 5.2 of the EIS. Withdrawal and use of surface water for plant operations is regulated by the South Carolina Department of Health and Environmental Control. System design alternatives specifically addressing alternatives that affect the consumption and use of makeup water for the proposed project are found in Section 9.4.1. Further, the proposed project was compared to representative alternative generation technologies that were capable of a commensurate level of energy such as coal and natural gas in Section 9.2.2. Water-use and water-quality impacts were not evaluated as part of the EIS for alternative technologies such as wind and solar because those technologies are unable to meet the stated need and purpose of the proposed project. Therefore, no change was made to the EIS as a result of these comments.*

### E.2.23 Comments Concerning Alternatives – System Design

**Comment:** My concern is thermal pollution from the cooling water from the plants. And it is my understanding that when you run and operate a nuclear reactor, that about two-thirds of the potential energy in the uranium, is discharged in heat, and not used for electricity production. I know that they are going to have a cooling tower at these two new nuclear power plants, and that they do not have a cooling tower at the original nuclear plant. And that the discharge water, back into Parr Reservoir, will be approximately 10,000 gallons per minute, at 95 degrees temperature. I realize that this temperature will vary up and down because of ambient temperature, and they do have a cooling tower proposed for these two new plants. And my only thing that I'm thinking about, I hate to see the potential energy, in 10,000 gallons a minute, at 95 degrees, say, for the life of the plant, maybe at 50 years would be wasted. And my thoughts are that that heat energy, and I realize that it is low value heat, should be used for a useful purpose for man. And that this useful purpose should return an income to the power companies that are going to operate the two reactors, or the three reactors, actually, because you have to consider the one that is already there. That they should produce an income stream, over the life of the plant, that is returned back to the power company. And I have no solution to the problem, except I was thinking, just in my mind, about two things. Maybe a very large green house that could utilize that heat energy, which would probably be too much heat in the summer, and not enough in the winter time, but utilize that heat energy in a very large green house, or even fish culture. If you were trying to raise warm water fish, that you would have that flow, and then return the water back into Parr reservoir, or some other use for a large volume of water at that temperature. (0002-1 [Martin, John])

**Comment:** The subject of my discussion, and it will be very short, is warm water. And I want you all to think out of the box, because I'm not smart enough to figure this out, but I hope some of you are. All of you, or most of you, know that about two-thirds of the heat that is produced in a nuclear plant is wasted, it goes out as hot water. It goes into a cooling tower, and it goes back in the atmosphere, or back into a lake in this case. I understand, from these two nuclear power plants, that the water that is going to be discharged, as far as the blow-down procedure, will be about 95 degrees, and it will amount to about 10,000 gallons a minute. I hate waste. And I got to thinking, the other day, could we use 10,000 gallons of water a minute, or is that an hour? Sorry, it is a minute. At 95 degrees, for some useful purpose for people? Let's not waste it. I don't know what the answer is, but let's think out of the box. I was thinking about heating a green house, cool the water down even further before it is put back in. Maybe you can think of some other things. This ought to be relatively simple. Help me, let's think out of the box. (0003-23 [Martin, John])

**Response:** *Section 5.2.3.1 presents the impact of warm water discharged to Parr Reservoir on water quality. The NRC does not advise the applicant on alternative uses of waste heat from a power plant; these decisions are made by the applicant and State regulatory bodies. No change was made to the EIS as a result of these comments.*

**Comment:** [DNR] Staff recently attended a meeting with representatives of SCE&G to discuss thermal impacts from the proposed discharge into Parr Reservoir and the alternative of discharging heated water instead into Monticello Reservoir. Discharging heated water into Parr Reservoir, and hence into the Broad River may compromise restoration efforts for anadromous and diadromous fishes and the rare robust redhorse and therefore does not appear to be the least damaging alternative. Monticello Reservoir was constructed with the purpose of serving as cooling water source for Unit 1, and DNR questions why this alternative is not the preferred alternative. DNR requested and received from SCE&G additional information on the thermal plume in Monticello Reservoir associated with the operation of Unit 1 and recommends further communication with SCE&G regarding the feasibility of this alternative. (0020-14 [Perry, Robert D.]

**Response:** *Discharge alternatives are presented in Section 9.4.2.2, including the alternative of discharging blowdown water to Monticello Reservoir through the discharge canal for VCSNS Unit 1. This alternative was determined to not be environmentally preferable because the impact of blowdown discharge on Parr Reservoir had been determined to be SMALL. No changes were made to the EIS as a result of this comment.*

#### **E.2.24 Comments Concerning Alternatives – Sites**

**Comment:** First, the project for installation for two new Toshiba Westinghouse AP 1000 nuclear reactors, was elected Jenkinsville site in 2005, which is not proper to the future large size of gigawatts base load with the location mostly close to the Atlantic Ocean. Like, for example, Boeing, Charleston Ports, with new Jasper Ocean Terminal, and other big loads. This is a very big mistake for efficient energy production and distribution in modern grid. Also it has to include the future so-called transportation corridor, north south between Miami, New York, and maybe Canada. (0004-31 [Wojcicki, Joe])

**Comment:** For SCE&G the only solution is to select another location where seawater can be used for the cooling system. This kind of solution was implemented in existing reactors in Japan, France, and is planned in Florida, in our country. First, the installation of two AP 1000 is in China, close to the east China sea, where sea water will be cooling the reactors. (0004-34 [Wojcicki, Joe])

**Comment:** Today it is still not too late to move these two to Atlantic Coast, and save water for the people of South Carolina. After installing them here in Jenkinsville, we will find them generating electricity probably in less than 50 percent, and then it will be too late. (0004-37 [Wojcicki, Joe])

**Comment:** The project for installation two new Toshiba-Westinghouse AP 1000 nuclear reactors elected Jenkinsville, SC site. This selection was done in 2005 which is not proper for future large (GW) base load with their location mostly close to Atlantic Ocean as Boeing in

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Charleston, ports with new Jasper Ocean Terminal, and others. This is a big mistake for the efficient energy production and distribution in modern grid, including future N-S energy corridors. (0005-1 [Wojcicki, Joe])

**Comment:** For SCE&G the only solution is to select another location where seawater can be used for their cooling systems. This kind of solution was implemented in existing reactors in Japan, France and planned in Florida. First world installation of AP 1000 is close to East China Sea where seawater will cool reactors. (0005-4 [Wojcicki, Joe])

**Comment:** Today is still not too late to move these two babies to Atlantic coast and save water for people of SC. After installing them here in Jenkinsville we will find them generating electricity probably in less than 50 % and then will be too late, after spending 10 to 20 billion dollars of ratepayer money because SCE&G company is a Monopoly and you have no way to switch to other electric utility. (0005-6 [Wojcicki, Joe])

**Comment:** The Problem: ENTIRE WORK -- NUREG-1939 Draft Environmental Impact Statement for Combined Licenses for Virgil C. Summer Nuclear Station Units 2 and 3 Draft Report for Comment HAS NO ENVIRONMENTAL and ENGINEERING VALUE because of VERY WRONG LOCATION NEW UNITS, i. e. JENKINSVILLE, SC. ....The general question is: Why in the process of the review SCE&G Application nobody was as smart as Chinese who located their first two AP 1000 reactors close to sea and will use seawater for cooling? (0018-1 [Wojcicki, Joe])

**Comment:** An ignorance of Public Input (Atlantic Ocean Location-AOL) by removing this obvious superior solution over any of so-called SCE&G alternative locations selected in 2005. (0018-11 [Wojcicki, Joe])

**Comment:** The team working on DEIS had to find their AOL [Atlantic Ocean Location] or, at least suggests new selection to be done acknowledging US/SC reality in 2008-2010 with electrical loads' future. (0018-9 [Wojcicki, Joe])

**Response:** *These comments express the view that the commenter would have considered other factors than those considered by the proponent of the project, SCE&G, in its site-selection process and included in its alternative siting evaluation. NRC regulations require an applicant for a COL to evaluate alternative sites to determine whether there is any obviously superior alternative to the site proposed. Not all possible alternative sites must be considered, just a "reasonable" subset of possible alternatives. The review process used by the NRC involves a two-part sequential test outlined in the Environmental Standard Review Plan (ESRP). The first stage of the review uses reconnaissance-level information to determine whether there are environmentally preferable sites among the alternatives. If environmentally preferable sites are identified, the second stage of the review considers economic, technological, and institutional factors for the environmentally preferred sites to see if any of the sites is obviously superior to*



*the proposed site. If an alternative site is found to be obviously superior to the proposed site, the review team would recommend denial of the permit or license. No alternative site evaluated by the applicant or by the review team was determined to be environmentally preferable. The review team evaluated the site-selection process provided by the applicant and found that it used a systematic methodology; used a reasonable set of evaluation and selection criteria as offered via an industry standard siting guide (EPRI 2002); and evaluated an acceptable number of reasonable sites. The siting analysis provided by the applicant considered 20 sites within South Carolina; 3 of which were located within 10 mi of the Atlantic coast. All three of these sites were excluded from further examination due to issues with ground acceleration, flooding potential, and potential impacts from storm surges. Further, the four alternative sites selected for the final alternative site evaluations, all appeared to be licensable and capable of meeting the proposed project objective of siting and operating two nuclear reactors. Therefore, no change was made to the EIS as a result of these comments.*

**Comment:** In national perspective, keeping Jenkinsville as a site of future Unit 2 and 3 will harm present bipartisan multi-reactor initiative. The initiative to allow switching from oil dependency to powering US economy / industry by electricity. It would be sabotage to Friend of Nuclear Renaissance. (0005-5 [Wojcicki, Joe])

**Response:** *The purpose of the EIS is to disclose the environmental impacts of the proposed project. The NRC's responsibility is to regulate the nuclear industry to protect the public health and safety within existing policy. The NRC is not involved in establishing and administering energy policies and these issues were not addressed in the EIS. No changes were made to the EIS as a result of this comment.*

### **E.2.25 Comments Concerning Benefit-Cost Balance**

**Comment:** We [Southern Alliance for Clean Energy] have serious concerns about SCE&G and Santee Cooper's push to build two costly new reactors at the existing V.C. Summer Plant. The uncertainties associated with building new nuclear reactors continue to escalate, putting rate payers, tax payers, and the environment at increasing risk. (0003-1 [Hancock, Mandy])

**Comment:** I am ready to give explanations that are more detailed on revealed aspects of possible wrong decision, that will charge South Carolina residents much more per kilowatt hour than we were advised by South Carolina Electric and Gas. According to my knowledge from the hearing, which was last Monday, practically all of the costs will be covered by rate payers. So probably, and according to what I heard from the South Carolina Electric and Gas people, they don't need any loan to be guaranteed by President Obama. (0004-35 [Wojcicki, Joe])

**Comment:** [W]e are going to spend 10 to 20 billion dollars of rate payers, because South Carolina Electric and Gas Company is a monopoly. And nobody can practically select their

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power suppliers, if you are living in the area that are under the delivery in the monopoly's region. (0004-38 [Wojcicki, Joe])

**Comment:** [My troubleshooting and verification found ERRORS in: ] Lack of understanding or ignorance of present financial situation of SC residents and industry. (0018-7 [Wojcicki, Joe])

**Response:** *The purpose of the EIS is to disclose the potential environmental impacts of constructing and operating the proposed Units 2 and 3. Setting retail power rates is outside the NRC's regulatory purview; those determinations are the responsibility of the Public Service Commission of South Carolina. Because of the dynamic nature of the rate-setting process, including the uncertainty as to how any increase would be distributed between residential, commercial, and industrial customers, analyzing the likelihood and magnitude of future rate changes (if any) would entail undue speculation by the review team. The EIS was not modified as a result of these comments.*

**Comment:** This fact is further complicated by the reality of the high cost of new nuclear reactors that have, historically, led to cost overruns and rate increases. This is happening, currently, in South Carolina and elsewhere. The price for new reactors, such as Westinghouse's yet to be certified AP 1000 design that SCE&G intends to build, has skyrocketed. Utilities in Florida, pursuing the same reactor design, have recently stated a cost of 8.6 to 11.25 billion per reactor, nearly quadrupling their estimates from just three years ago. The NRC needs to review updated demand forecasts and cost figures in South Carolina. (0003-7 [Hancock, Mandy])

**Comment:** Fortunately, the people who invest capital in this country don't believe that nuclear power is a good investment. This is part of the reason why no new nuclear power plants have been built. And President Obama, and other people, have put forward the idea that nuclear power is the wave of the future. And this is, basically, nothing more than a payback to Exelon, and other corporations that have invested in his campaign. I don't believe that if this were not going to be federally subsidized, it wouldn't be built, period. (0004-11 [Jocoy, Gregg])

**Comment:** The second reason that I think that this is premature, it was mentioned earlier, as far as I can determine there is no financing from Wall Street for this project. It is only going to go forward if it gets a nuclear loan guarantee from the federal government, and if the money can be borrowed from the federal government. This nuclear loan guarantee bailout has already been offered to plant Vogtle and Georgia Power, across the Savannah River. And SCE&G is on the short list to get a nuclear loan guarantee bailout. But if that doesn't come through, the project is in serious trouble. This EIS doesn't take that into account, the Draft EIS. (0004-43 [Clements, Tom])

**Comment:** Southern Alliance for Clean Energy is a regional non-profit organization with members in South Carolina and across the Southeast concerned about the impacts energy

choices have on our health, economy and environment. We have serious concerns about SCE&G and Santee Cooper's push to build two costly new AP1000 reactors at the existing V.C. Summer nuclear plant. The uncertainties associated with building new nuclear reactors continue to escalate, putting ratepayers, taxpayers, and the environment at increasing risk. (0017-1 [Barczak, Sara] [Hancock, Mandy])

**Comment:** [T]he reality of the high cost of new nuclear reactors that have historically led to cost overruns and rate increases. This is happening currently in South Carolina and elsewhere. The price for new reactors, such as Westinghouse's yet-to-be-certified AP1000 design that SCE&G intends to build, has skyrocketed. Utilities in Florida pursuing the same reactor design have recently stated costs of \$8.6 to \$11.25 billion per reactor, more than tripling their estimates from several years ago. The NRC needs to review updated demand forecasts and cost figures for the proposed V.C. Summer expansion in South Carolina, as it is highly unlikely that new reactors are a more cost-effective choice than a combination of energy efficiency and renewables or the no action alternative. It is highly unlikely that the costs of building two new reactors at the Summer site would cost \$9.8 billion as expressed in Table 10-4 of the DEIS. (0017-6 [Barczak, Sara] [Hancock, Mandy])

**Response:** *The costs and benefits of construction and operation of the proposed VCSNS Units 2 and 3 were addressed in Chapter 10 of the EIS using the best information available to the review team. Neither the NRC nor the USACE has the authority or responsibility by law or regulation to ensure that the proposed plant is the least costly alternative for providing energy services under any particular set of assumptions concerning future circumstances. In Chapter 9, the EIS provides analysis of the potential for alternative non-nuclear technologies to provide the electricity that could be generated by the proposed plant and the environmental impacts of those alternatives. The NRC is not involved in establishing energy policy. Rather, it regulates the nuclear industry to protect the public health and safety and the environment within existing policy. Therefore, comments regarding the potential effect of a particular nuclear power investment on the future development and implementation of alternative technologies, subsidies for nuclear power, and characterization of financial risks associated with such projects are not within the scope of this environmental review. No changes were made to the EIS as a result of these comments.*

## **E.2.26 General Comments in Support of the Licensing Process**

**Comment:** Our V.C. Summer management team supports the NRC's thorough process for regulating the design, construction, and operation of commercial nuclear power plants. This rigorous process and close oversight are in the best interests of all stakeholders. It helps to ensure that the plans for our new nuclear project are held to the highest standards of excellence. (0003-18 [Archie, Jeff])

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**Comment:** Our [SCE&G's] V.C. Summer management team supports the NRC's thorough process for regulating the design, construction, and operation of commercial nuclear plants in this country. This rigorous process, and close oversight, are in the best interests of all stakeholders. It helps to ensure that the plans for our nuclear project are held to the highest standards of excellence. (0004-26 [Archie, Jeff])

**Response:** *These comments express general support for the NRC COL process. No change was made to the EIS as a result of these comments.*

### E.2.27 General Comments in Support of the Existing Plant

**Comment:** And, quite frankly, it is the same high standards of excellence that we, at V.C. Summer, have demanded of ourselves every single day that we have operated the V.C. Summer Unit 1 Nuclear Station, here in Jenkinsville. We are committed to safety, it is our number one priority, and it is our main mission. We will continue to be committed to protecting the health and safety of the public, our employees, and our environment. And that is exactly what we have been doing, since we started commercial operation of the V.C. Summer station 26 years ago. Our commitment to safety and excellent performance is recognized by industry organizations year after year. (0003-19 [Archie, Jeff])

**Comment:** Let me speak, for a minute, about our employees. The employees at V.C. Summer care about this community. Over the years we have supported numerous service projects and other initiatives that make a real difference in people's lives. And we will continue to serve our community. And it is not just the financial gifts we make, it is not just the jobs we create. Even bigger than that are the hours of service that our employees put in for the causes, such as Heart Walk, juvenile diabetes, blood donations, meals-on-wheels, homework centers, and so much more. (0003-20 [Archie, Jeff])

**Comment:** Our [SCE&G's] commitment to safety, our commitment to the NRC process, our commitment to the community, or commitment to communications, guide our steps as we continue to work hard on our new nuclear project. As someone who was born and raised in Jenkinsville, who came to V.C. Summer as a college intern 30 years ago, and never left, I pledge to you that we, at V.C. Summer, will continue to hold ourselves to the highest standards of excellence, as we work to provide safe and reliable energy well into the future. (0003-22 [Archie, Jeff])

**Comment:** And, quite frankly, it is the same high standard of excellence that we [SCE&G], at V.C. Summer, have demanded of ourselves every single day that we have operated V.C. Summer Unit 1 Nuclear Station here in Jenkinsville. We are committed to safety, it is our number 1 priority, it is our main mission. We will continue to be committed to protecting the health and safety of the public, our employees, and the environment. And that is exactly what we have been doing since we started commercial operation at V.C. Summer 26 years ago. Our

commitment to safety and excellent performance is recognized by industry organizations year after year. (0004-27 [Archie, Jeff])

**Comment:** Let me speak, for a minute, about our employees. The employees at V.C. Summer care about this community. Over the years we have supported numerous service projects, and other initiatives that make a real difference in people's lives. And we will continue to serve our community. And it is not just the financial gifts that we make, it is not just the jobs we create, even bigger than that are the hours of service that our employees put in for causes such as the heart walk, juvenile diabetes, blood donations, meals-on-wheels, homework centers, and so much more. (0004-28 [Archie, Jeff])

**Comment:** Our [SCE&G's] commitment to safety, our commitment to the NRC process, our commitment to the community, and our commitment to communications guide our steps as we continue to work hard on our new nuclear project. As someone who was born and raised here in Jenkinsville, who came to V.C. Summer as a college intern 30 years ago, and never left, I pledge to you that we, at V.C. Summer, will continue to hold ourselves to the highest standards of excellence, as we work to provide safe and reliable energy well into the future. (0004-30 [Archie, Jeff])

**Response:** *These comments express support of the applicant or of the existing unit at the site. No changes were made to the EIS as a result of these comments.*

## E.2.28 General Comments in Opposition to the Licensing Action

**Comment:** And the bottom line is I support the take no action option, and I hope that you folks will do that. (0004-22 [Jocoy, Gregg])

**Comment:** In national perspective, keeping Jenkinsville a site of future Unit 2 and 3, will harm present bipartisan multi-reactor initiative. The initiative to allow switching from oil dependency to powering U.S. economy industry by electricity. (0004-36 [Wojcicki, Joe])

**Comment:** So I think that the negatives of this project outweigh the positives, and I would support the no-action alternative. (0004-48 [Clements, Tom])

**Comment:** I am a landowner in Jenkinsville and I would not like to see another nuclear site or two be placed here in Jenkinsville this is a rural area. Why must you come here I am against it all the way. (0006-1 [Martin, Michael])

**Comment:** This is another example of corporate profits at public cost. The Obama administration, to pay back political debts for Exelon and other nuclear concerns, is dumping billions into this rat hole of Greed. The NRC and USACE are complicit in a crime against the

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people of South Carolina and the environment we all depend on. All of you should be ashamed for your role in this travesty. I support the TAKE NO ACTION option. (0007-2 [Jocoy, Gregg])

**Comment:** I have a mother that is up in age and it frighten me to think of a site with two reactors coming into this small area. I am sure you can find a more safety place than [this?]. I was against the first one so I am against two more think about the people that live here and not the dollar it will bring here. (0008-1 [Gay, Christopher])

**Comment:** I truly don't want those site here in Jenkinsville in a small place like Jenkinsville which is most resident area. Please think about our health. (0009-2 [Gay, Roberta])

**Comment:** I am very concern and unhappy about the plans in placing these two additional nuclear power reactors in our neighborhood. (0013-1 [Byrd, Verna])

**Comment:** I have reviewed the comments submitted to the United States NRC in Washington, DC. It is documented very clearly that these two proposed nuclear power reactors should not be constructed in Jenkinsville, South Carolina. (0014-1 [Byrd, Verna])

**Response:** *These comments express opposition to the VCSNS Units 2 and 3 COL. No changes were made to the EIS as a result of these comments.*

### E.2.29 General Comments in Opposition to the Licensing Process

**Comment:** Frankly, I don't think that any of you care a bit about what I think about this project, I don't think you care about what the people who live here think about this project. I think you have already made your decisions, and I think that that is going to move forward. (0004-10 [Jocoy, Gregg])

**Comment:** I want to start by saying that five minutes to address an issue this important is completely unacceptable. You spent four hours on a dog and pony show, and then spent 45 minutes of our time, up here, going over the same stuff that was down in that room that entire time. And to limit the comments to five minutes is just ridiculous. The --I apologize, once again, for using your first name and not your last, Chip.

You said that the NRC wanted to be here in person. I believe that the NRC had to be here in person, that it is required by the law. It is not --- well, then I stand corrected. (0004-8 [Jocoy, Gregg])

**Response:** *These comments express opposition to the NRC's licensing process. No new information was provided; therefore, no change was made to the EIS.*

### E.2.30 Comments Concerning Issues Outside Scope – Emergency Preparedness

**Comment:** I have some concerns, as I have always had, about the safety and operation of the plant. And I have always asked some questions about the evacuation route, I know there is going to be signs for that, how do we inform our senior citizens, those who are disabled. (0002-3 [Marcharia, Kamau])

**Comment:** And the question I have, of course, like the oil wells, what if something happens, a catastrophic event, what is the contingency plan, and how do we citizens know what the contingency plan be if something went drastically wrong at that plant. (0002-7 [Marcharia, Kamau])

**Comment:** But I do think that these are things for you all to consider. And I certainly think that you should be talking with your county council people, your city council people, your sheriff, et cetera. I used to live in York County, and I'm here to tell you what. There are two nuclear reactors on the Catawba River, on Lake Wiley. There is an awful lot of people that live in the Charlotte area. There are two reactors up on Lake Norman. If there is a reaction, if there is a reactor failure up there, and there is a meltdown, or any kind of release of a lot of radiation from those power plants, there is no way in the world that they can evacuate that area, none. You ask, you call the person who is responsible for your county emergency management, and ask them what they know about their current plans to evacuate this area in the event of a reactor problem. (0004-17 [Jocoy, Gregg])

**Response:** *When reviewing COL applications, the NRC conducts both a safety and an environmental review. The NRC's regulations for preparing an EIS are distinct from the regulations for reviewing safety issues. The regulations governing the environmental review are set forth in Title 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and the regulations covering the safety review are in 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." Because the two reviews are separate, operational safety issues are considered outside the scope of the environmental review, just as environmental issues are not considered part of the safety review. However, the NRC staff forwards safety issues that are raised during the environmental review to the appropriate NRC organization for consideration and appropriate action. These comments were related to emergency planning, which is a safety issue that is outside the scope of the environmental review. Therefore, no changes were made to the EIS.*

### E.2.31 Comments Concerning Issues Outside Scope – Miscellaneous

**Comment:** We [SCE&G] recognized that we could communicate better. So since then we have done even more tours with more groups. We have done more presentations at schools, churches, civic organizations, and other groups, and we continue to work with the media. On top of that, we have started a community coalition and a community newsletter. This newsletter is especially for you, the residents of Western Fairfield County. We send it to mail boxes

## Appendix E

throughout the area, and we place it in other locations, such as churches and the gas stations, so you can conveniently get the information. The content of the newsletter is, largely, based on our discussions with the community coalition. This group of about ten people, who live right here in the community, have been coming to the plant once a month for a year, to talk about community concerns. They help us understand what their friends, family, neighbors want and need to hear from us. Newsletter content has included things like how to apply for a job, where to get training for jobs, what do I do if I hear the sirens go off? Where do I go if I need to evacuate? What is going on with our new nuclear project, and how will our new reactors be different than the current one? We want to hear from you. We consider communications to be a two-way street, and we want to know what is on your mind. And we want you to know the facts. (0003-21 [Archie, Jeff])

**Comment:** I'm pleased to say that we [SCE&G] could name many ways that we were communicating effectively with the community, but we recognized that we could communicate more, we recognized that we could communicate better. Since then we have done even more tours, with more groups. We have done more presentations at schools, churches, civic organizations, and other groups. And we continue to work with the media. On top of that we have started a community coalition and a community newsletter, which many of you have read and given us comments on. This newsletter is especially for you, the residents of western Fairfield County. We send it to mailboxes throughout the area, and place it in other locations, such as churches, and at the gas stations, so that you can conveniently get it. The content of the newsletter is largely based on our discussions with the community coalition. This group of about 10 people who live right here in the community, have been coming to the plant once a month, for the last year, to talk to us about community concerns. They help us understand what their friends, family and neighbors want and need to hear from us. The newsletter content has included how to apply for jobs, where to get training for jobs, what to do if you hear the sirens, where to go if you need to evacuate, what is going on with our new nuclear project, how will the new reactors be different from our current one? We want to hear from you. We consider communication is a two way street. We want to know what is in your minds, and we want to give you the facts. (0004-29 [Archie, Jeff])

**Response:** *These comments were supportive of the proposed VCSNS Units 2 and 3 and discuss SCE&G's outreach to the community. However, the comments provided no new information related to the environmental review. Therefore, no changes were made to the EIS as a result of these comments.*

**Comment:** The comment that the permits for the power lines has not been handled yet is silly. Come on, guys, they are not going to permit the building of a power plant and spend billions of dollars to build it, and then deny them a permit to build the power lines. They are keeping you in the dark, they know where they are going to go, they know what they are going to do, and they just don't want you to know about it, for whatever reason. (0004-12 [Jocoy, Gregg])



**Comment:** Post script, over 30 years of my design and verification of different kind of big energy project, I never have seen so terrible part of the application delivered by South Carolina Electric and Gas. (0004-40 [Wojcicki, Joe])

**Comment:** SCE&G will never be able to do what was done 30 years ago with the building of the #1 nuclear power reactor. Today policymakers and employees aren't the same ones who planned and constructed the Nuclear Power Reactor #1. The last reactor was built in 1985 and as you know most have retired or at retirement age. (0014-4 [Byrd, Verna])

**Response:** *The review team conducted its environmental review and prepared this EIS in accordance with the requirements of the National Environmental Policy Act (NEPA), 10 CFR Part 52, and 10 CFR Part 51. The EIS is also intended to provide the environmental information needed for the USACE to meet its NEPA obligations. The review was based on information presented in the COL application ER submitted by the applicant and information obtained from independent sources. The review also considered refined information from the applicant pertaining to the routing and design of proposed transmission lines. No changes were made to the EIS as a result of these comments.*

**Comment:** Up to now there were no professionals (at least among selected by SC ORS [South Carolina Office of Regulatory Staff] experts / panels) to discuss this matter in SC PSC SCE&G project as well as smart grid dockets consequences of this terrible Jenkinsville selected location. It seems that only I could do [voluntarily] technical verification but get no, the same common sense - engineering, response [rebuttals]

#### CONCLUSION.

All above I s a proof I am the only expert who points to billion mistake. I am ready to show all the errors, including misleading assumption for the water availability from Broad River. I spent too many days and done too many pages of paperwork that was ignored in 100% so I will do this to the panel of serious professionals. (0018-12 [Wojcicki, Joe])

**Response:** *Mr. Wojcicki's petition to intervene was addressed in "NRC Staff Brief in Opposition to Wojcicki Appeal of LBP-09-2, Docket Nos. 52-027 and 52-028" and is outside the scope of the environmental review. No changes were made to the EIS as a result of this comment.*

### E.2.32 Comments Concerning Issues Outside Scope – NRC Oversight

**Comment:** The reason I asked the question about Dames & Moore, is because the Nuclear Regulatory Commission and the government in general, is well known for cycling people in and out of industry. What wasn't made clear, in the answer, was that Dames & Moore apparently is a company that spends an awful lot of time working for the nuclear industry. So you have nuclear industry people coming in to regulate the nuclear industry, and then back out again.

## Appendix E

This is the sort of thing that brings people like me to question everything that you folks do. (0004-9 [Jocoy, Gregg])

**Comment:** The USE National Interest requires full, serious, investigation. Last (2010) events of series of explosions proved serious negligence in the process of permits as well as government agencies' monitoring methods [commenter believed to be referring to April 2010 oil rig explosion in Gulf of Mexico]. (0018-10 [Wojcicki, Joe])

**Response:** *These comments did not provide new information related to the environmental effects of the proposed action. Therefore, no changes were made to the EIS as a result of these comments.*

### E.2.33 Comments Concerning Issues Outside Scope – Safety

**Comment:** I hope that SCE&G, or the nuclear power plant don't put profit over protection of the people in this community. (0002-9 [Marcharia, Kamau])

**Comment:** I am a day care owner in the area of the V.C. Summer Nuclear Site and with one site now I feel very unsafe and to know that they plan to place to [two] more site here [terrifies] me as to what may my safety be as well as my business. (0009-1 [Gay, Roberta])

**Comment:** Take notice, BP Oil Spill, Three Mile Island, Rock Slides, Earthquakes, Bridges Collapses, Mud Slides, Volcano Erupting, Mine Collapsing, radiation leaks and waste, flights missed their landing due to neglect and let's not forget the evil ones. This is just a few. (0013-5 [Byrd, Verna])

**Comment:** Nearby neighborhood property has not been tested for security of withstanding digging, blasting, etc., which can become sink holes/earth decay or any other Unforeseen obstruction. (0013-7 [Byrd, Verna])

**Comment:** It is documented that the Nuclear Regulatory Commission does little to protect the public. I pray that the statement is proven to be untrue. In 2000 VC Summer Nuclear Power Plant in Jenkinsville has suffered leaks of radiation in the coolant system. You and I know that there are unreported and/or documented accidents that have occurred. (0014-3 [Byrd, Verna])

**Response:** *The NRC's principal responsibility is to protect the health and safety of the public when authorizing the use of radioactive material. Because the NEPA regulations do not include a safety review, the NRC has codified the regulations for preparing an EIS separately from the regulations for reviewing safety issues. The regulations governing the environmental review are set forth in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and the regulations covering the safety review are in 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." For this reason, the*

*license process includes an environmental review that is distinct and separate from the safety review. Because the two reviews are separate, operational safety issues are considered outside the scope of the environmental review, just as environmental issues are not considered part of the safety review. However, the staff forwards safety issues that are raised during the environmental review to the appropriate NRC organization for consideration and appropriate action. These comments are related to safety and are outside the scope of the staff's environmental review. Therefore, no changes were made to the EIS.*

#### **E.2.34 Comments Concerning Issues Outside Scope – Security and Terrorism**

**Comment:** The recycling of spent fuel, and the increased radiation content of these isotopes will not only increase risk of high level exposure, but also the proliferation of nuclear weapons. (0002-17 [Anderson, Russell])

**Response:** *The EIS for a new license does not include security issues, such as physical protection and the capability to respond to an external attack. The NRC staff considers these issues in its safety review, separate from the environmental review. Some of the detailed information pertaining to security is considered to be safeguards information; as such, it cannot be shared with the public for security reasons. If a license is issued, security issues will be periodically reviewed, inspected, and updated at every operating plant. These reviews continue throughout the period of an operating license, whether it is for the original or renewed license. If issues related to security are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are reviewed and incorporated under the operating license. These comments are related to security and terrorism, both of which are outside the scope of the environmental review. Therefore, no changes were made to the EIS.*

**Comment:** A disaster can happen due to explosion, air strikes, trucks or boats bombs, and terrorists, melt-down, earth quake, radiation leaks and waste, human neglects etc. Lives will be destroyed. We as citizen have to pay the cost of your profit and loss. (0013-6 [Byrd, Verna])

**Response:** *Comments related to security and terrorism are safety issues that are not within the scope of the environmental review. The NRC is devoting substantial time and attention to terrorism-related matters, including coordination with the Department of Homeland Security. As part of its mission to protect public health and safety and the common defense and security pursuant to the Atomic Energy Act, the NRC staff is conducting vulnerability assessments for the domestic use of radioactive material. In the time since September 2001, the NRC has identified the need for license holders to implement compensatory measures and has issued several orders to license holders imposing enhanced security requirements. Finally, the NRC has taken actions to ensure that applicants and license holders maintain vigilance and a high degree of security awareness. Consequently, the NRC will continue to consider measures to prevent and mitigate the consequences of acts of terrorism in fulfilling its safety*

## Appendix E

*mission. Additional information about the NRC staff's actions regarding physical security since September 11, 2001, can be found on the NRC's website (www.nrc.gov).*

### **E.2.35 General Editorial Comments**

**Comment:** Page 1-10, line 25-26: Fairfield Unit 1 (Fa-1) site should be referred to as the Fa-1 site (Fairfield County greenfield site).

Page 2-1, line 23: "Monticous Road" should be Monticello Road. (0016-1 [Clary, Ronald])

**Comment:** Page 2-87, line 8: Delete "for each unit." There is only one nuclear operating unit. (0016-11 [Clary, Ronald])

**Comment:** Page 2-96, line 6: Change to "four new cooling towers..."

Page 2-96, line 7: Change to "... VCSNS site *and* the Unit 1 containment building..." (0016-13 [Clary, Ronald])

**Comment:** Page 2-130, line 19: Replace "Santee Cooper" with "SCE&G". (0016-15 [Clary, Ronald])

**Comment:** Page 3-9, line 33: Insert "port" after "diffuser". (0016-18 [Clary, Ronald])

**Comment:** Page 4-18, line 30: "turbidity curtains" should be silt fence.

Page 4-26, line 9: "turbidity curtains" should be silt fence. (0016-22 [Clary, Ronald])

**Comment:** Page 4-56, line 23: Suggest clarification that Monticello Reservoir is not a source of "public water" except for VCSNS Unit 1. (0016-26 [Clary, Ronald])

**Comment:** Page 5-4, lines 29-30: Suggest change in wording to "...from the old Frees Creek basin and indirectly ..." Frees Creek no longer exists. (0016-28 [Clary, Ronald])

**Comment:** Page 6-16, line 24: Fairfield Unit 1 site should be "FA-1" site. (0016-30 [Clary, Ronald])

**Comment:** Page 2-47: The reference for Figure 2-15 should be SCE&G 2009a. (0016-5 [Clary, Ronald])

**Response:** *These comments are editorial in nature. The EIS was changed to address these comments.*

**Comment:** Page 7-25, line 26-27: Incomplete sentence. (0016-33 [Clary, Ronald])

**Response:** *Section 7.5 was modified to make this sentence a complete sentence.*

### E.3 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, “Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants.”

10 CFR Part 71. Code of Federal Regulations, Title 10, *Energy*, Part 71, “Packaging and Transportation of Radioactive Material.”

40 CFR Part 423. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 423, “Steam Electric Power Generating Point Source Category.”

40 CFR Part 1508. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 1508, “Terminology and Index.”

51 FR 30028. August 21, 1986. “Safety Goals for the Operation of Nuclear Power Plants; Policy Statement Correction and Republication.” *Federal Register*. U.S. Nuclear Regulatory Commission.

55 FR 38472. September 18, 1990. “Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation.” *Federal Register*. U.S. Nuclear Regulatory Commission.

74 FR 28112. June 19, 2009. “In the Matter of NuScale Power, Inc. and All Other Persons; Who Seek or Obtain Access to Safeguards Information Described Herein; Order Imposing Safeguards Information Protection Requirements for Access to Safeguards Information (Effective Immediately).” *Federal Register*. U.S. Nuclear Regulatory Commission.

74 FR 66496. December 15, 2009. “Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act.” *Federal Register*. U.S. Environmental Protection Agency.

75 FR 21368. April 23, 2010. “South Carolina Electric and Gas Acting for Itself and as an Agent for South Carolina Public Service Authority (Also Referred to as Santee Cooper) Notice of Availability of the Draft Environmental Impact Statement for the Combined Licenses for Virgil C. Summer Nuclear Station, Units 2 and 3.” *Federal Register*. U.S. Nuclear Regulatory Commission.

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75 FR 21625. April 26, 2010. "Environmental Impact Statements; Notice of Availability." *Federal Register*. U.S. Environmental Protection Agency.

75 FR 81032. December 23, 2010. "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation." *Federal Register*. U.S. Nuclear Regulatory Commission.

Clean Water Act. 33 USC 1251, et seq. (also referred to as the Federal Water Pollution Control Act [FWPCA]).

Electric Power Research Institute (EPRI). 2002. *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application*. Product ID: 1006878, Palo Alto, California.

Fischer, L.E., C.K. Chou, M.A. Gerhard, C.Y. Kimura, R.W. Martin, R.W. Mensing, M.E. Mount, and M.C. Witte. 1987. *Shipping Container Response to Severe Highway and Railway Accident Conditions*. NUREG/CR-4829. U.S. Nuclear Regulatory Commission, Washington, D.C.

Karl, T.R., J.M. Melillo, and T.C. Peterson, eds. 2009. *Global Climate Change Impacts in the United States*. Cambridge University Press, New York.

MACTEC Engineering and Consulting, Inc. (MACTEC). 2009. *V.C. Summer Nuclear Station, Units 2 and 3, Transmission Line Siting Study Santee Cooper—Revision #1*. Prepared for Santee Cooper. Accession No. ML102160577.

National Historic Preservation Act of 1966 (NHPA). 16 USC 470, et seq.

Pike Energy Solutions, LLC (Pike). 2010. *V.C. Summer Nuclear Station, Units 2 and 3, Transmission Line Siting Study Addendum Number 1*. Prepared for South Carolina Electric & Gas Company. Charlotte, North Carolina. Accession No. ML102980200.

Public Service Commission of South Carolina (PSCSC). 2008. *South Carolina Electric & Gas Company Combined Application for Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order*. Docket No. 2008-196-E, Columbia, South Carolina.

Public Service Commission of South Carolina (PSCSC). 2009. *Application of South Carolina Electric & Gas Company for the Establishment and Approval of DSM Programs and Rate Rider*. Docket No. 2009-261-E, Columbia, South Carolina.

Rivers and Harbors Appropriation Act of 1899. 33 USC 403, as amended.

Santee Cooper. 2008. *South Carolina Public Service Authority Integrated Resource Plan 2008*. Santee Cooper, Moncks Corner, South Carolina.

S.B. A318 Section 3. 2008. "Wind Energy Production Farms Feasibility Study Committee." South Carolina General Assembly, S.B. A318, R389, H4766, 117<sup>th</sup> Session.

South Carolina Electric and Gas (SCE&G). 2009. Letter from Ronald B. Clary (SCE&G, Vice President, New Nuclear Deployment) to U.S. Nuclear Regulatory Commission dated November 20, 2009 in response to letter from Ronald B. Clary dated February 13, 2009, "Subject: V.C. Summer Nuclear Station Units 2 and 3 Docket Numbers 52-027 and 52-028 Combined Licenses Application – Supplemental Response to NRC Environmental Report (ER) Information Needs NP-1, AQ-11 and AQ-13." NND-09-0320. Accession Number ML093310245.

South Carolina Electric and Gas (SCE&G). 2010a. Letter from R.B. Clary (SCE&G,) to U.S. Nuclear Regulatory Commission dated October 6, 2010 referencing R.B. Clary letter dated October 2, 2010, "Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application – Docket Numbers 52-027 and 52-028 – Voluntary Submittal for the Environmental Report to Update Transmission Line Information." NND-10-0361. Accession No. ML102850211.

South Carolina Electric and Gas (SCE&G). 2010b. Letter from Ronald B. Clary (SCE&G, Vice President, New Nuclear Deployment) to U.S. Nuclear Regulatory Commission dated September 8, 2010 in reference to letters from Ronald B. Clary dated July 2, 2010 and July 9, 2010, "Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 - SCE&G Voluntary Submittal Related to the Environmental Report Chapter 8." NND-10-0334. Accession No. ML102530165.

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U.S. Nuclear Regulatory Commission (NRC). 1977. *Final Environmental Statement on Transportation of Radioactive Material by Air and Other Modes*. NUREG-0170, Vol.1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000. *Environmental Standard Review Plan–Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Vol. 1, Washington, D.C. Includes 2007 revisions.

Wind Energy Production Farms Feasibility Study Committee. 2009. *South Carolina's Role in Offshore Wind Energy Development*. South Carolina Energy Office, Columbia, South Carolina. Available at [http://www.energy.sc.gov/publications/Wind%20Energy%20Production%20Farms%20Feasibility%20Study%20Committee%20Final%20Report%2012-09%20\(2\).pdf](http://www.energy.sc.gov/publications/Wind%20Energy%20Production%20Farms%20Feasibility%20Study%20Committee%20Final%20Report%2012-09%20(2).pdf).





## **Appendix F**

**Key Combined License Consultation Correspondence  
Regarding the Virgil C. Summer Nuclear Station Units  
2 and 3 Combined License Application; and Biological  
Assessments**



## Appendix F

### Key Combined License Consultation Correspondence Regarding the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application; and Biological Assessments

Correspondence received during the evaluation process for the combined license application for the siting of Units 2 and 3 at the Virgil C. Summer Nuclear Station (VCSNS) in Fairfield County, South Carolina, is identified in Table F-1. The correspondence can be found in NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room) (note that the URL is case-sensitive). ADAMS accession numbers are also provided in Table F-1. In addition, a full copy of the biological assessments prepared for the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) are included in this appendix. These assessments are unchanged from the April 2010 draft environmental impact statement (EIS). Consultation with FWS and NMFS that has occurred since the publication of the April 2010 draft EIS is documented in Table F-1. The supplemental biological assessments prepared for NMFS and FWS can be found immediately following the original biological assessments.

**Table F-1.** Key Consultation Correspondence

Source	Recipient	Date of Letter and ADAMS Accession Number
U.S. Fish and Wildlife Service (Mr. Timothy Hall)	U.S. Nuclear Regulatory Commission	January 22, 2009 ML090330702
Advisory Council on Historic Preservation (Ms. Charlene Dwin Vaughn)	U.S. Nuclear Regulatory Commission (Gregory Hatchett)	February 17, 2009 ML090840377
South Carolina Department of Natural Resources (Ms. Vivianne Vejdani)	U.S. Nuclear Regulatory Commission	March 6, 2009 ML090840384
South Carolina Archives and History Center, State Historic Preservation Office (Ms. Caroline D. Wilson)	U.S. Nuclear Regulatory Commission (Tamsen Dozier)	October 20, 2009 ML093080369

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**Table F-1.** (contd)

<b>Source</b>	<b>Recipient</b>	<b>Date of Letter and ADAMS Accession Number</b>
South Carolina Archives and History Center, State Historic Preservation Office (Ms. Rebekah Dobrasko)	U.S. Nuclear Regulatory Commission	May 25, 2010 ML101540528
National Oceanic and Atmospheric Administration–National Marine Fisheries Service (Mr. Miles M. Croom)	U.S. Nuclear Regulatory Commission	July 19, 2010 ML102070376
U.S. Fish and Wildlife Service (Mr. Jay Herrington)	U.S. Nuclear Regulatory Commission	July 26, 2010 ML102160401
U.S. Nuclear Regulatory Commission (Mr. Ryan Whited)	U.S. Fish and Wildlife Service (Mr. Jay Herrington)	March 10, 2011 ML110600628
U.S. Nuclear Regulatory Commission (Mr. Ryan Whited)	National Oceanic and Atmospheric Administration–National Marine Fisheries Service (Mr. David Bernhart)	March 10, 2011 ML110670209
U.S. Fish and Wildlife Service (Mr. Jay B. Herrington)	U.S. Nuclear Regulatory Commission (Mr. Ryan Whited)	March 14, 2011 ML110900346



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407



January 22, 2009

1/25/09  
74 FR 323  
①

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RULES AND DIRECTIVES  
BRANCH  
SERIES

Chief, Rules and Directives Branch  
Division of Administrative Services  
Office of Administration  
Mail Stop TWB-05-B01M  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Re: Virgil C. Summer Nuclear Station, Units 2 & 3 Combined License Application,  
Fairfield County, SC, FWS Log No. 42410-2009-SL-0109

Dear Sir/Madam: The U.S. Fish and Wildlife Service (Service) has received Nuclear Regulatory Commission's (NRC) request to participate in the environmental scoping process and for a list of protected species within the area proposed to construct two new nuclear reactors at the Virgil C. Summer Nuclear Station in Fairfield County, SC. The NRC is reviewing an application by South Carolina Electric and Gas (SCE&G) for a combined license for two new reactors, Units 2 and 3, adjacent to the Monticello Reservoir. Your request is being made as required by the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the Fish and Wildlife Coordination Act of 1934 to facilitate the development of an Environmental Impact Statement (EIS) evaluating potential environmental issues and alternative considerations.

Your request is twofold, to solicit comments from the Service on potential environmental concerns and to obtain a list of threatened and endangered (T&E) species that may be present and affected by the project. This response from the Service will provide the list of T&E species requested, general scoping comments will be provided under separate letter within a timely manner.

Along with the two proposed reactor units, SCE&G identified a need to expand transmission line corridors outside of Fairfield County. The siting area identified includes nine additional counties located throughout the state; Calhoun, Chester, Colleton, Dorchester, Hampton, Lancaster, Lexington, Orangeburg and Richland Counties. Please find attached a list of T&E species that are known to or may occur within the counties identified in your letter. This list includes species of state and Federal concern. Reconnaissance efforts for the reactor construction and

SUNSI Review Complete  
Template = ADM-013  
TAKE PRIDE IN AMERICA  
E-RDS = ADM-03  
Call = E. HyLton (E.H.)

## Appendix F

transmission line siting must include a search for the federally listed T&E species. We also recommend survey efforts include the state listed species in its biological assessment. Please contact the S.C. Department of Natural Resources for further information on these species and their habitat requirements. Please note that several streams within Lancaster County are considered critical habitat for the Carolina heelsplitter, *Lasmigona decorata*. Gills Creek, Flat Creek and the Lynches River are considered essential for the conservation of the heelsplitter and are afforded protection under section 7 of Endangered Species Act.

The Service appreciates the opportunity to provide this information for the development of this project. If you have any questions regarding the Service's comments, please do not hesitate to contact Mark Caldwell at (843) 727-4707 Ext. 215.

Sincerely,



Timothy N. Hall  
Field Supervisor

TNH/MAC

cc: Mr. Mark Cantrell, USFWS, Asheville, NC

**South Carolina Distribution Records of  
Endangered, Threatened, Candidate and Species of Concern  
March 2008**

E	Federally endangered
T	Federally threatened
P	Proposed in the Federal Register
CH	Critical Habitat
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
S/A	Federally protected due to similarity of appearance to a listed species
SC	Federal Species of concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.
*	Contact the National Marine Fisheries Service for more information on this species

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following.

**CALHOUN COUNTY**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Occurrence</b>
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Possible
Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Least trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	SC	Known
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Possible
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Blueback herring	<i>Alosa aestivalis</i> *	SC	Known

## Appendix F

### CHESTER COUNTY

Common Name	Scientific Name	Status	Occurrence
Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Possible
Georgia aster	<i>Aster georgianus</i>	C	Known
Dwarf aster	<i>Aster mirabilis</i>	SC	Possible
Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Prairie birdsfoot-trefoil	<i>Lotus purshianus</i> var. <i>helleri</i>	SC	Possible
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Possible
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible

### COLLETON COUNTY

Common Name	Scientific Name	Status	Occurrence
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Wood stork	<i>Mycteria Americana</i>	E	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Piping plover	<i>Charadrius melodus</i>	T, CH	Known
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i> *	E	Known
Leatherback sea turtle	<i>Dermochelys coriacea</i> *	E	Known
Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
Green sea turtle	<i>Chelonia mydas</i> *	T	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
Pondberry	<i>Lindera melissifolia</i>	E	Possible
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Angiosperm (no common name)	<i>Elytraria caroliniensis</i>	SC	Known
Godfrey's privet	<i>Forestiera godfreyi</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Carolina bird-in-a-nest	<i>Macbridea caroliniana</i>	SC	Known
Crested fringed orchid	<i>Pteroglossaspis ecrinata</i>	SC	Known
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Possible



Kirtland's Warbler	<i>Dendroica kirtlandii</i>	E	
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Possible
Red knot	<i>Calidris canutus</i>	C	Possible
Black-throated green warbler	<i>Dendroica virens</i>	SC	Possible
Swallow-tailed kite	<i>Elanoides forficatus forficatus</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
American oystercatcher	<i>Haematopus palliatus</i>	SC	Known
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Black rail	<i>Laterallus jamaicensis</i>	SC	Possible
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Gull-billed tern	<i>Sterna nilotica</i>	SC	Known
Bluebarred pygmy sunfish	<i>Elassoma okatie</i>	SC	Known
Southern hognose snake	<i>Heterodon simus</i>	SC	Possible
Island glass lizard	<i>Ophisaurus compressus</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Blueback herring	<i>Alosa aestivalis*</i>	SC	Known

**DORCHESTER COUNTY**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Occurrence</b>
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Wood stork	<i>Mycteria Americana</i>	E	Possible
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
Pondberry	<i>Lindera melissifolia</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
Bog asphodel	<i>Nartheccium americanum</i>	C	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Gopher frog	<i>Rana capito</i>	SC	Known
Chapman's sedge	<i>Carex chapmanii</i>	SC	Known
Angiosperm (no common name)	<i>Elytraria caroliniensis</i>	SC	Known
Savannah or Piedmont cowbane	<i>Oxypolis ternate</i>	SC	Known
Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known

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False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
Least trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	SC	Known
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Possible
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
Black-throated green warbler	<i>Dendroica virens</i>	SC	Possible
Swallow-tailed kite	<i>Elanoides forficatus</i> <i>forficatus</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Swainson's warbler	<i>Limnothlypis swainsonii</i>	SC	Known
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
Gopher tortoise	<i>Gopherus polyphemus</i>	SC	Known
Southern hognose snake	<i>Heterodon simus</i>	SC	Possible
Blueback herring	<i>Alosa aestivalis</i> *	SC	Known

### FAIRFIELD COUNTY

Common Name	Scientific Name	Status	Occurrence
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Possible
Georgia aster	<i>Aster georgianus</i>	C	Known
Prairie birdsfoot-trefoil	<i>Lotus purshianus</i> var. <i>helleri</i>	SC	Possible
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Possible
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Carolina darter	<i>Etheostoma collis</i>	SC	Known

### HAMPTON COUNTY

Common Name	Scientific Name	Status	Occurrence
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Wood stork	<i>Mycteria Americana</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known

Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Gopher frog	<i>Rana capito</i>	SC	Known
Chapman's sedge	<i>Carex chapmanii</i>	SC	Known
Angiosperm (no common name)	<i>Elytraria caroliniensis</i>	SC	Known
Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
Swallow-tailed kite	<i>Elanoides forficatus forficatus</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Bluebarred pygmy sunfish	<i>Elassoma okatie</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Southern hognose snake	<i>Heterodon simus</i>	SC	Possible
Northern pine snake	<i>Pituophis melanoleucus melanoleucus</i>	SC	Known
Blueback herring	<i>Alosa aestivalis*</i>	SC	Known

## LANCASTER COUNTY

Common Name	Scientific Name	Status	Occurrence
Carolina heelsplitter	<i>Lasmigona decorata</i>	E, CH	Known
Little amphianthus	<i>Amphianthus pusillus</i>	T	Known
Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Known
Black-spored quillwort	<i>Isoetes melanospora</i>	E	Known
Dwarf aster	<i>Aster mirabilis</i>	SC	Possible
Sandhills milkvetch	<i>Astragalus michauxii</i>	SC	Known
Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Prairie birdsfoot-trefoil	<i>Lotus purshianus</i> var. <i>helleri</i>	SC	Possible
Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible

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Brook floater	<i>Alasmidonta varicosa</i>	SC	Known
Blueback herring	<i>Alosa aestivalis</i> *	SC	Known

**LEXINGTON COUNTY**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Occurrence</b>
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Possible
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Possible
Smooth coneflower	<i>Echinacea laevigata</i>	E	Possible
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Dwarf aster	<i>Aster mirabilis</i>	SC	Possible
Shoal's spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Prairie birdsfoot-trefoil	<i>Lotus purshianus</i> var. <i>helleri</i>	SC	Possible
Piedmont cowbane	<i>Oxypolis ternate</i>	SC	Known
Wire-leaved dropseed	<i>Sporobolus teretifolius</i>	SC	Known
Pickering's morning-glory	<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	SC	Known
Rayner's blueberry	<i>Vaccinium crassifolium</i> ssp. <i>sempervirens</i>	SC	Known
Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Southern hognose snake	<i>Heterodon simus</i>	SC	Possible
Blueback herring	<i>Alosa aestivalis</i> *	SC	Known

**ORANGEBURG COUNTY**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Occurrence</b>
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Southern Dusky	<i>Desmognathus auriculatus</i>	SC	Possible

Salamander			
Gopher frog	<i>Rana capito</i>	SC	Known
Incised groovebur	<i>Agrimonia incise</i>	SC	Known
Wagner's spleenwort	<i>Asplenium heteroresiliens</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Possible
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	SC	Possible
Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Blueback herring	<i>Alosa aestivalis*</i>	SC	Known

#### RICHLAND COUNTY

Common Name	Scientific Name	Status	Occurrence
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Known
Wood stork	<i>Mycteria Americana</i>	E	Possible
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Carolina heelsplitter	<i>Lasmigona decorate</i>	E	Possible
Georgia aster	<i>Aster georgianus</i>	C	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Sandhills milk-vetch	<i>Astragalus michauxii</i>	SC	Known
Purple balduina	<i>Balduina atropurpurea</i>	SC	Known
Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Creeping St. John's wort	<i>Hypericum adpressum</i>	SC	Known

## Appendix F

Bog spicebush	<i>Lindera subcoriacea</i>	SC	Known
Prairie birdsfoot-trefoil	<i>Lotus purshianus</i> var. <i>helleri</i>	SC	Possible
Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
Algae-like pondweed	<i>Potamogeton confervoides</i>	SC	known
False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
Awed meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
Reclined meadow-rue	<i>Thalictrum subrotundum</i>	SC	Known
White false-asphodel	<i>Tofieldia glabra</i>	SC	Known
Rayner's blueberry	<i>Vaccinium crassifolium</i> ssp. <i>Empervirens</i>	SC	Known
Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
Henslow's sparrow	<i>Ammodramus henslowii</i>	SC	Known
American kestrel	<i>Falco sparverius</i>	SC	Known
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	Known
Painted bunting	<i>Passerina ciris ciris</i>	SC	Possible
Carolina darter	<i>Etheostoma collis</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Southern hognose snake	<i>Heterodon simus</i>	SC	Known
Blueback herring	<i>Alosa aestivalis</i> *	SC	Known



Preserving America's Heritage

February 17, 2009

Gregory P. Hatchett  
Acting Branch Chief  
Environmental Projects Branch 2  
Division of Site and Environmental Reviews  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Ref: *Notification and request for consultation and participation in the scoping process for Units 2 and 3, combined license application review for the Virgil C. Summer Nuclear Station near Fairfield County, South Carolina*

Dear Mr. Hatchett:

On January 13, 2009, the Advisory Council on Historic Preservation (ACHP) received from the Nuclear Regulatory Commission (NRC) a notification pursuant to Section 800.8(c) of the ACHP's regulations, "Protection of Historic Properties" (36 CFR 800), regarding the referenced project. We appreciate receiving your notification, which establishes that NRC will use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with Section 106 of the National Historic Preservation Act in lieu of the procedures set forth in 36 CFR 800.3 through 800.6.

In addition to notification to the ACHP, NRC must also notify the South Carolina State Historic Preservation Officer and meet the standards in Section 800.8(c)(1)(i) through (v) for the following:

- identifying consulting parties;
- involving the public;
- identifying historic properties and assessing the undertaking's effects on historic properties; and
- consulting regarding the effects of the undertaking on historic properties with the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, other consulting parties, and the ACHP, where appropriate, during NEPA scoping, environmental analysis, and the preparation of NEPA documents.

ADVISORY COUNCIL ON HISTORIC PRESERVATION  
1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004  
Phone: 202-606-8503 • Fax: 202-606-8647 • [achp@achp.gov](mailto:achp@achp.gov) • [www.achp.gov](http://www.achp.gov)

## Appendix F

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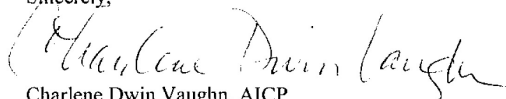
To meet the requirement to consult with the ACHP as appropriate, the NRC should notify the ACHP in the event NRC determines, in consultation with the SHPO/THPO and other consulting parties, that the proposed undertaking(s) may adversely affect properties listed, or eligible for listing, on the National Register of Historic Places (historic properties). In addition, Section 800.8(c)(2)(i) requires that you submit to the ACHP any DEIS or EIS you prepare. Inclusion of your adverse effect determination in both the DEIS/EIS and in your cover letter transmitting the DEIS/EIS to the ACHP will help ensure a timely response from the ACHP regarding its decision to participate in consultation. Please indicate in your cover letter the schedule for Section 106 consultation and a date by which you require a response by the ACHP.

The regulations do not specifically require that an agency submit an EA to the ACHP. However, keep in mind that, in the case of an objection from the ACHP or another consulting party, Sections 800.8(c)(2)(ii) and (c)(3) provide for ACHP review of an EA (in addition to a DEIS or EIS) to determine whether preparation of the EA, DEIS or EIS has met the standards set forth in Section 800.8(c)(1) and/or to evaluate whether the substantive resolution of the effects on historic properties proposed in an EA, DEIS or EIS is adequate.

If NRC's determination of adverse effect will be documented in an EA, we request that you notify us of the adverse effect and provide adequate documentation for its review. The ACHP's decision to review an EA, DEIS or EIS will be based on the applicability of the criteria in Appendix A of the ACHP's regulations.

Thank you for your notification pursuant to Section 800.8(c). If you have any questions or if we may be of assistance, please contact Najah Duvall-Gabriel by phone at 202-606-8585 or via e-mail at [ngabriel@achp.gov](mailto:ngabriel@achp.gov).

Sincerely,



Charlene Dwin Vaughn, AICP  
Assistant Director  
Federal Permitting, Licensing and Assistance Section  
Office of Federal Agency Programs



## South Carolina Department of Natural Resources



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John E. Frampton  
Director  
Robert D. Perry  
Director, Office of  
Environmental Programs

March 6, 2009

Chief, Rules and Directives Branch  
Division of Administrative Services  
Office of Administration  
Mail Stop TWB-05-B01M  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

REFERENCE: REQUEST FOR PARTICIPATION IN THE SCOPING PROCESS AND LIST OF STATE LISTED PROTECTED SPECIES FOR THE ENVIRONMENTAL REVIEW FOR THE VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3, COMBINED LICENSE APPLICATION

Dear Chief, Rules and Directives Branch:

Reference is made to the Combined License Application (COL) submitted by South Carolina Electric and Gas Company (SCE&G) and South Carolina Public Service Company (Santee Cooper) in support of application for a combined license for construction and operation of two nuclear power plants at its Virgil C. Summer Nuclear Station (VCSNS) site. South Carolina Department of Natural Resources (DNR) staff reviewed the extensive COL. This correspondence includes comments on the COL, respectfully submitted.

The VCSNS site is co-owned by SCE&G and Santee Cooper and is located in Fairfield County, South Carolina on the Broad River. The VCSNS site currently has one operating pressurized light water reactor with the capacity to generate 966 megawatts of electricity. SCE&G proposes to construct two new nuclear units adjacent to the existing site. SCE&G has also identified the need for transmission line corridor expansion. The siting area for proposed transmission lines would include Calhoun, Chester, Colleton, Dorchester, Hampton, Lancaster, Lexington, Orangeburg, and Richland counties, in addition to Fairfield County.

## Appendix F

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The Broad River is an outstanding resource of state and regional significance and is important habitat for the priority conservation species robust redhorse (*Moxostoma robustum*) and American shad (*Alosa sapidissima*), a wide diversity of freshwater fish and mussel species, and economically important recreational fisheries. The river also supports numerous populations of the rare and sensitive plant species rocky shoals spider lily (*Hymenocallis coronaria*). High quality natural areas and hardwood forests occur along the river corridor and are home to a diversity of game and non-game wildlife species. Many nesting populations of bald eagle (*Haliaeetus leucocephalus*) inhabit its floodplain and depend on the Broad as a source of food. The river is also an important water supply resource for municipalities, hydropower and various industries.

Overall the COL is thorough and the information is well organized, concise and clearly written. DNR recognizes and appreciates efforts by the licensee to avoid and minimize impacts to natural resources. However, our agency has identified a number of concerns regarding potential impacts of the planned facility, particularly those affecting water supply and aquatic habitat of the Broad River and associated water bodies. These concerns are described as follows, and reference the section of the COL to which they correspond:

### CHAPTER 2 ENVIRONMENTAL DESCRIPTION

#### Sec. 2.2.2 Transmission Corridors and Off-Site Areas

The COL provides a broad overview of existing and proposed transmission line corridors. Final routes will be identified in the upcoming Phase 3 transmission line study. DNR requests consultation throughout Phase 3 and the final route selection process.

#### Sec. 2.3.1.1.1 Rivers and Streams

The COL refers to the calculation of mean daily and mean monthly flow in the Broad River using the Richtex, Alston and Carlisle USGS stream gauges. However, it is unclear what methods or additional data were used to estimate inflow into the Parr Reservoir. Were flows estimated using a combination of USGS gauge flow data, scaled down to the drainage area of the reservoir, or were they estimated with a water balance equation? A complete description of methodology is needed to evaluate flow estimates provided in the COL.

#### Sec. 2.3.1.1.3 Low Flows

The COL describes a seven-day average low flow of 156 cfs calculated from 2002 flow data from the Alston gauge, located approximately 1.2 miles downstream of Parr Shoals Dam. A 100-year daily mean flow of 125 cfs, and a 100-year seven-day average low flow of 430 cfs were also calculated for the Alston gauge. The seven-day average low flow at the Parr dam was estimated to be 190 cfs, also in 2002. A 7Q10 flow equaling 853 cfs was estimated from data from the Richtex and Alston gauges. There is no information on historical or estimated low

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inflow to the Parr Reservoir other than that provided from the Carlisle gauge, 21 miles upstream of the project site. According to the COL, historical daily mean flows in the Broad River at the

Alston gauge have been as low as 48 cfs (2002). The COL adds that this flow was *not considered representative of natural river flows because it was influenced by the upstream flow diversion from the Parr Reservoir to Fairfield Pumped Storage Facility*. This statement seems to suggest that downstream flows are run-of-river and not regulated by the operation of the Parr project and Fairfield Pumped Storage Facility (FPSF).

The COL states that *the state of South Carolina uses the 7Q10 flow to determine potential impacts*. This statement is misleading. The South Carolina Department of Health and Environmental Control uses the 7Q10 of a water body to determine the assimilative capacity of that water body when setting limits to effluents in National Pollutant Discharge Elimination System permits. DNR follows the guidelines of the South Carolina Water Plan (second edition, 2004) when evaluating potential impacts to state water resources. ([www.dnr.sc.gov/water/hydro/water\\_plan.htm](http://www.dnr.sc.gov/water/hydro/water_plan.htm)).

#### Sec. 2.3.1.1.4 Dams and Reservoirs

The COL states that the pan evaporation loss rate from the Parr Reservoir was estimated from data obtained from DNR, but the exact source of this data is not identified. In addition, there is no information provided on how evaporative loss was estimated for the Monticello Reservoir. Complete information is needed on the data and methods used to estimate pan evaporation loss rates for Parr and Monticello reservoirs.

This section provides a very general overview of the operation of the reservoirs and FPSF, stating that *pumping is normally done at maximum capacity*. There is no information on whether operation is modified during times of low flow. Is pumping curtailed during times of extreme low flows? Is operation of the Parr hydro facility modified during low flows? Information on how water is apportioned between reservoirs, the FPSF and the Broad river, particularly during low flow periods, is needed. If no provisions exist, then a drought response plan will need to be developed in consultation with regulatory and resource agencies.

DNR manages the Parr Reservoir and Monticello Reservoir Waterfowl Management Areas, and the Monticello Sub-Impoundment supports a recreational fishery. Water level fluctuations within the reservoirs and their potential impact on waterfowl habitat and fisheries are of concern. Increased temperatures during low flows have caused fish kills in the Monticello Reservoir. In the early to mid-1990s the licensee employed several mitigation measures, including dredging the discharge canal in 1993, to increase water circulation and cool water temperatures during low flow periods. No fish kills have been reported since that time. It is not known what, if any, impacts may accrue from increased reservoir fluctuations attributable to the addition of Units 2 and 3. Additional consultation throughout licensing is requested to address these concerns.

## Appendix F

Chief, Rules and Directives Branch  
Virgil C. Summer Nuclear Station  
March 6, 2009

### Sec. 2.3.2.2 Local Surface Water Use

On page 2.3-21 the COL indicates that the licensee intends to request a license amendment of the Parr hydro project for increased water withdrawals for the operation of Units 2 and 3. Licensed flows for the Parr Hydro project are 1,000 cfs or average daily natural inflow (less evaporation)

during the striped bass spawning season of March, April and May, and 800 cfs (less evaporation) for the remainder of the year, with a minimum instantaneous flow release of 150 cfs. Estimated evaporative loss from Unit 1 alone is estimated at between 8.7% to 15% of the licensed minimum instantaneous flow of 150 cfs. Increased evaporative loss from the addition of Units 2 and 3 could have significant impacts on downstream flows, particularly during times of low flow. The state of South Carolina continues to experience drought conditions of unprecedented severity and duration. As of this writing, the entire state is in drought status ranging from “incipient” to “extreme”. This fact underscores the supreme importance of carefully and thoroughly evaluating the hydrological impact of the proposed expansion.

### Sec. 2.4.3.1 Rare/Sensitive Species

As noted in the COL, DNR stocks robust redbreast and smallmouth bass in the Broad River. Smallmouth bass have developed into a spawning population and fishery of increasing local and regional significance. Robust redbreast will continue to be stocked by DNR with the goal of creating a self-sustaining population. Both species were collected in the Monticello Reservoir in 2008. It is not known whether the intake area of the Parr Reservoir and FPSF is attracting these species, and there is a concern that increased pump-back operations may have an adverse impact on smallmouth bass and robust redbreast populations.

## CHAPTER 4 IMPACTS OF CONSTRUCTION

### General Comments

We recommend the licensee incorporate low impact procedures such as constructed wetlands, rain gardens, and double silt fencing throughout construction. Storm water detention facilities should be built well above floodplains and wetlands, and should not impound any streams. Detention facilities should discharge to constructed wetlands for further treatment of stormwater runoff. In shoreline areas, the applicant should use bioengineering techniques to the greatest extent possible. Maximum width buffers should be maintained between any construction site and any aquatic site. These buffers should be non-disturbance areas that are maintained in natural vegetation.

### Sec. 4.3.1.1 The Site and Vicinity

The COL states that *a small portion of a small intermittent stream and its associated wetland extend slightly into the area in which the cooling towers would be located; a portion of this wetland would be impacted by construction activities.* During an interagency meeting with the

Chief, Rules and Directives Branch  
 Virgil C. Summer Nuclear Station  
 March 6, 2009

licensee on February 5, 2009, anticipated impacts to intermittent stream and wetland were described as totaling approximately 600-700 linear feet and approximately 0.30 acre of wetland. We recommend avoiding all impacts to onsite streams and wetlands to the greatest practicable extent. An appropriate mitigation plan for unavoidable impacts to waters of the United States should be reviewed and approved by resource agencies and provided consistent with the Federal Mitigation Rule.

#### Sec. 4.3.2.1.1 Construction of Intake Structure and Blowdown Line

Two water intakes and one discharge are included as lake impacts. A raw water intake and a water treatment plant intake will be constructed in the Monticello Reservoir. Construction of the raw water intake will be accomplished in the dry with the assistance of a sheet pile coffer dam surrounded by silt curtains. The applicant has proposed to pump silt-laden water from behind the coffer dam into the space between the coffer dam and the silt curtain. Rather than pumping silt-laden water directly into Monticello, water should be filtered to remove silt and sediment before it is returned to the reservoir.

### CHAPTER 5 IMPACTS OF STATION OPERATION

#### Sec. 5.1.2 Transmission Corridors and Off-Site Areas

See comment above, Sec. 2.2.2.

#### Sec. 5.3.2.1.2 Modeling of Blowdown Temperatures

The CORMIX model was used to model the extent of the thermal plume that would exceed applicable SCDHEC water quality standards of  $T > 90^{\circ}\text{F}$  or  $\Delta T$  of  $5^{\circ}\text{F}$  above ambient river temperatures. A variety of scenarios were modeled using input flows synthesized from Carlisle and Alston gauge flows. The “worst case scenario” was identified as follows: 2 cycles of concentration through cooling towers, 7Q10 flows, no operation of the FPSF, and max- $\Delta T$ (winter). The extent of the plume resulting from these conditions was modeled to be ~ 0.30 to 0.40 acre and would extend ~ 25% of the reservoir’s width. Inflow to the Parr reservoir has been considerably lower than the modeled 7Q10 flow. Adverse impacts to aquatic resources can be significant if organisms are not able to avoid or find refugia from the thermal plume. More information is needed on the extent of the plume under very low flow conditions (e.g., flows less than the 7Q10 of 853 cfs). DNR requests additional consultation on the analysis of thermal impacts for low-flow conditions.

### CHAPTER 10 PROPOSED ACTION CONSEQUENCES

#### Sec. 10.5.2 Cumulative Impacts of Operations

The COL indicates that during low flow periods the additional consumptive water loss associated with Units 2 and 3 would be mitigated by removing water from the reservoirs rather than *directly removing water from the Broad*. The COL also identifies the Lee Nuclear plant as a future

## Appendix F

Chief, Rules and Directives Branch  
Virgil C. Summer Nuclear Station  
March 6, 2009

upstream water user, adding that cumulative impacts of VC Summer and Lee nuclear plants will be *small* with the addition of any *water supply features and mitigation measures*. However, the COL does not indicate how water is to be allocated between the reservoirs and river, or how operation of the Parr project and FPSF will be modified, to mitigate low flows. The COL indicates a minimum reservoir elevation of 418 ft. What are the operational or physical constraints on minimum reservoir elevation? As stated above, it is of extreme importance that issues of water supply during low flows are thoroughly addressed and appropriate mitigation measures are clearly identified, in consultation with regulatory and resource agencies, during the licensing process.

In conclusion, because of nuclear energy's relatively non-existent green-house gas emissions DNR supports opportunities to consult, review and participate in discussions involving additional reliance on nuclear power for generation of electricity. In view of the magnitude of the above-listed potential impacts, DNR urges diligence and additional documentation/consultation with respect to potential project impacts. We appreciate the opportunity to participate in the scoping process.

Please contact me at 803-734-4199 if you have any questions regarding this matter or if we can be of further assistance.

Sincerely,

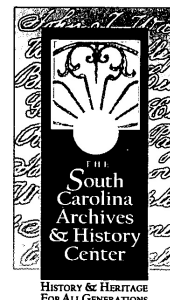
*Vivianne Vejdani*

Vivianne Vejdani,  
DNR NRC Coordinator,  
Wildlife and Freshwater Fisheries Division

c: Don Winslow  
Bob Perry  
Steve DeKozlowski  
Bud Badr  
Breck Carmichael  
Hal Beard

October 20, 2009

Tamsen Dozier  
NRO/DSER/RAP1  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001



Re: V.C. Summer Nuclear Plant Archaeological Site

Dear Ms Dozier:

Thank you for your e-mail of September 29, regarding the above referenced project. It is our understanding that a letter issued from our office on August 16, 2006 contained incorrect information on an archaeological site located at the V.C. Summer Nuclear Plant. The site that has been determined ineligible for listing on the National Register of Historic Places is 38FA322.

If you have any questions, please contact me at (803) 896-6169 or cwilson@scdah.state.sc.us.

Sincerely,

Caroline Dover Wilson  
Review and Compliance Coordinator  
State Historic Preservation Office

D083  
NRO

Appendix F

May 25, 2010

4/23/2010  
75 FR 21368  
①

RULES AND DIRECTIVES  
BRANCH  
USNRC

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Chief, Rules, Announcements, and Directives Branch  
Division of Administrative Services  
Office of Administration, Nuclear Regulatory Commission  
Mailstop TWB-05-B01M  
Washington, DC 20555-0001

RECEIVED



Re: V.C. Summer Nuclear Station, Units 2 and 3  
Draft Environmental Impact Statement  
Fairfield County, South Carolina

Dear Sir or Madam:

Thank you for your letter of April 15, which we received on April 23, regarding the Combined Operating License for the V.C. Summer Nuclear Station. We also received a copy of the Draft Environmental Impact Statement as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the Nuclear Regulatory Commission and the Corps of Engineers pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800.

Our office concurs with the findings of the draft EIS, particularly the development of management plans to administer cultural resources on the V.C. Summer Nuclear Plant site. We also concur that transmission lines associated with the site may have impacts on historic properties, but that these impacts are not known at this time. We concur that SCE&G and Santee Cooper should work with both our office, the Corps of Engineers, and any associated tribes or other interested parties to develop a management plan or programmatic agreement to address potential effects related to the proposed transmission lines.

Based on the recommendations to fence and avoid known historic properties and to develop management plans or programmatic agreements to address the indirect and unknown effects of transmission line construction, our office concurs with the NRC's determination that the proposed license should have **no adverse effect** on historic properties.

We look forward to continuing to work with the Corps of Engineers, SCE&G, and SCANA on the implementations of the recommendations in this draft EIS.

Our office **does not** need a hard copy of the final EIS, once issued. We will accept a CD copy of the EIS for our files. If you have any questions, please contact me at (803) 896-6183 or [dobrasko@scdah.state.sc.us](mailto:dobrasko@scdah.state.sc.us).

Sincerely,

*Rebekah Dobrasko*

Rebekah Dobrasko  
Supervisor of Compliance, Tax Incentives, and Survey  
State Historic Preservation Office

cc: Richard Darden, Corps of Engineers  
Steve Summer, SCANA (SCE&G)  
Ken Johnson, Santee Cooper

*E-RIDS = ADM-03*

S. C. Department of Archives & History • 8301 Parklane Road • Columbia • South Carolina • 29223-4905 • (803) 896-6100 • <http://scdah.sc.gov>

*50 NSE Review Complete  
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*add = p. Vokoon  
(P5V1)*





ML102070376 (email cmt 35)

**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
 263 13<sup>th</sup> Avenue South  
 St. Petersburg, Florida 33701-5511  
 (727) 824-5317; FAX (727) 824-5300  
<http://sero.nmfs.noaa.gov/>

July 19, 2010

F/SER4:PB/pw

(Sent via electronic mail)

Ms. Cindy Bladey  
 Chief, Rulemaking and Directives Branch  
 Office of Administration  
 Mail Stop: TWB-05-B01M  
 U.S. Nuclear Regulatory Commission  
 Washington, DC 20555-0001

Attn: Ms. Patricia Volkoun

Dear Ms. Bladey:

NOAA's National Marine Fisheries Service (NMFS) reviewed the Draft Environmental Impact Statement (EIS) for the combined construction permits and operating licenses (combined licenses or COLs) from the U.S. Nuclear Regulatory Commission (NRC) for the proposed new V.C. Summer Nuclear Station Units 2 and 3 (NUREG-1939). The Draft EIS pertains to an application submitted to NRC by the South Carolina Electric and Gas Company (SCE&G), acting for itself and on behalf of South Carolina Public Service Authority; the Draft EIS was issued for public review on April 30, 2010. The following comments are from the Protected Resources Division (PRD) and Habitat Conservation Division (HCD) of the NMFS Southeast Regional Office. Comments and recommendations are provided pursuant to authorities of the National Environmental Policy Act, Fish and Wildlife Coordination Act, and Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Separate coordination is necessary with NMFS PRD regarding the Endangered Species Act.

*Overview of Proposed Actions*

The proposed action includes (1) issuance by NRC of COLs for two new nuclear power reactor units (Units 2 and 3) at the V.C. Summer Nuclear Station in Fairfield County, South Carolina, and (2) issuance of a permit by the U.S. Army Corps of Engineers (COE) to allow SCE&G to perform construction activities on the site and within transmission line corridors. The COE is formally a cooperating agency in preparation of the EIS.

*Fishery and Aquatic Resources of the Santee River Basin*

Public trust fishery and aquatic resources directly and indirectly affected by project construction and long-term operation include ocean-migratory diadromous fish species, important riverine spawning and maturation habitats, riparian wetlands, water quantity and quality, and essential fish habitats for federally managed fishery species. Diadromous fishes of importance include American shad, river herring, striped bass, American eel, Atlantic sturgeon, and shortnose sturgeon; shortnose sturgeon is listed as endangered under the Endangered Species Act, and Atlantic sturgeon is listed as a species of special concern and a candidate for listing under the Endangered Species Act. State and federal fishery resource agencies are actively pursuing habitat restoration, fish passage, and recovery of migratory diadromous fish species in the Santee River Basin. Active research, monitoring and restoration projects are in progress in



coordination with SCE&G, the South Carolina Public Service Authority, Duke Energy, and interested conservation organizations. The Congaree-Broad River Sub-Basin is identified as a high priority for habitat restoration, future expansion of fish passage, and recovery of diadromous species. For this reason, consideration of present and future project effects on diadromous species must be fully considered in assessment of project effects and determination of effective mitigation measures.

#### *Essential Fish Habitat*

The South Atlantic Fishery Management Council and NMFS, in cooperation with state fishery management agencies, designates essential fish habitat (EFH) for federally managed species pursuant to the requirements of the Magnuson-Stevens Act. EFH for federally managed fishery species is present in tidal freshwater and estuarine portions of the Santee-Cooper River Basin, downstream from the V.C. Summer Project. It is important to note that American shad, river herring, and other related native members of the Family Clupeidae that migrate to estuarine or coastal marine waters are an important food source for federally managed species when utilizing their EFH. Direct effects on EFH are not anticipated from the project, hence an EFH assessment does not appear to be needed based on the current information.

#### *Potential Project Effects and NMFS Recommendations*

In consideration of interagency objectives for fish passage and habitat restoration and for recovery of shortnose sturgeon and Atlantic sturgeon in the Broad River above Parr Dam, the following future project effects on diadromous fishery resources should be fully considered during development of the Final EIS:

Fish Impingement and Entrainment. Water intakes constructed in Parr Reservoir as a component of the proposed V.C. Summer nuclear power units 2 and 3 should include intake locations and adequate fish screen designs to prevent entrainment and impingement of fish eggs, larvae, juveniles, and adults. Conceptual and final designs for the intake and screening should be coordinated with NMFS to ensure incorporation of adequate fish protection design criteria.

Thermal Impacts. The location, design, and operation of the proposed Parr Reservoir reactor-unit cooling water discharge structure should be carefully evaluated to ensure minimal adverse effects on future seasonal upstream and downstream migrations of diadromous fish and their survival in the reservoir. Conceptual and final designs for the outfall should be coordinated with NMFS to ensure adequate design and operation criteria to protect fish are incorporated.

Water Quality and Quantity, and Potential Climate Change Effects. The environmental sections of the Final EIS should fully address consumptive water withdrawal, water quality, and hydrological effects from plant operation on aquatic resources, including the aforementioned diadromous fish species and habitats that may become accessible in the future as a result of sturgeon recovery efforts during the full term of the NRC license. The EIS should analyze the indirect and cumulative effects of water withdrawals, thermal discharges, and radioactive discharges on riverine habitat downstream of the proposed project. Full consideration of potential hydrological effects from climate change should also be included in the EIS.

#### *Endangered Species Act Consultation*

NRC initiated consultation with NMFS PRD by letter dated April 15, 2010. Consultation for this project is required to ensure that the project's effects are not likely to jeopardize the continued existence of the endangered shortnose sturgeon. NMFS PRD plans to coordinate completion of ESA consultation with the NRC and the COE upon their review of NMFS comments and concerns and issuance of the Final EIS.

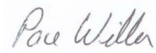
ML102070376 (email cmt 35)

*Conclusion*

The Draft EIS does not adequately describe or consider the potential long-term effects of the proposed actions on protection, management, and restoration of important diadromous fishery resources and on the survival and recovery of the endangered shortnose sturgeon in the area of direct and indirect project influence and the Santee-Cooper River Basin. Consequently, the current schedule for the EIS and license review may need to be reexamined to ensure diadromous fishery resources are adequately addressed.

We appreciate the opportunity to participate in review of the Draft EIS for the V.C. Summer Project. If questions arise, your staff may contact Mr. Prescott Brownell at our Atlantic Branch Office (843) 953-7204, or by email at Prescott.Brownell@noaa.gov.

Sincerely,



/ for

Miles M. Croom  
Assistant Regional Administrator  
Habitat Conservation Division

cc:

NRC, Summer.COLEIS@nrc.gov  
CESAC, Richard.Darden@usace.army.mil  
FWS, Jay\_Herrington@fws.gov  
EPA, Lord.Bob@epa.gov  
SCDNR, PerryB@dnr.sc.gov  
SCDNR, VejdaniV@dnr.sc.gov  
NOAA PPI, PPI.Nepa@noaa.gov  
F, nmfs.hq.nepa@noaa.gov  
F/SER, nmfs.ser.eis@noaa.gov  
F/SER3, Noah.Silverman@noaa.gov  
F/SER4, David.Dale@noaa.gov  
F/SER47, Prescott.Brownell@noaa.gov



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407



July 26, 2010

4/23/2010

751-R-21368

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RULES AND DIRECTIVES  
BRANCH  
UR-100

Chief  
Rules and Directives Branch  
Division of Administrative Services  
Office of Administration  
Mail Stop TWB-05-B01M  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Attn: Patricia Vokoun

Re: Virgil C. Summers Nuclear Station, Fairfield County, SC;  
Draft Environmental Impact Statement, FWS Log No. 42410-2010-CPA-0165  
Dear Sir/Madam:  
The U.S. Fish and Wildlife Service (Service) has received the Nuclear Regulatory Commission's (NRC) request for comments regarding the construction of two new nuclear reactors proposed by South Carolina Electric and Gas (SCE&G) near the Monticello Reservoir, Fairfield County, South Carolina. The NRC has developed a Draft Environmental Impact Statement (DEIS) to analyze environmental issues associated with the proposed construction. Your request is being made as required by the National Environmental Policy Act of 1969, the Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act of 1934 in preparation of an Environmental Impact Statement (EIS) evaluating potential environmental issues and alternative considerations. Included within the DEIS, a Biological Assessment (BA) was prepared to address potential impacts to threatened and endangered species (T&E) protected under the Endangered Species Act, as amended (Act).

NRC staff concluded in the BA that no T&E species will be impacted through construction of the proposed reactors on the current site. However, NRC recognizes there is a potential to impact T&E through construction/upgrade of six transmission lines proposed as part of the action. In the absence of on ground surveys for protected species NRC compared all the proposed corridors against known locations of T&E species based upon the S.C. Department of Natural Resources (SCDNR) Heritage Trust Program database. Based upon this data, NRC made a determination of impact to T&E species. NRC does note that the final locations of the transmission corridors are not yet known and that ground surveys will be performed once the preferred corridors are

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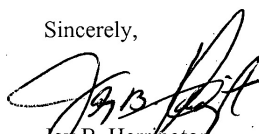


E-RIDS = ADH-03  
Call = P. Vokoun (PSU)

determined. The Service recommends that the Final EIS incorporate final corridor alignments of the transmission lines and a species/habitat impact analyses for each alignment. Comments regarding potential impacts to resources and T&E species or habitat cannot be made until the final locations are selected.

The Service appreciates the opportunity to provide comments on the DEIS for your consideration. If we can be of any assistance or if you have any questions regarding the Service's comments, please do not hesitate to contact Mark Caldwell at 843-727-4707 ext. 215.

Sincerely,



Jay B. Herrington  
Field Supervisor

JBH/MAC



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 10, 2011

Mr. Jay Herrington, Field Supervisor  
U.S. Fish and Wildlife Service  
Southeast Region 4  
176 Croghan Spur Road, Suite 200  
Charleston, SC 29407-7558

SUBJECT: SUPPLEMENT TO THE BIOLOGICAL ASSESSMENT RELATED TO THE  
REVIEW OF THE COMBINED LICENSES APPLICATION FOR THE VIRGIL C.  
SUMMER NUCLEAR STATION, UNITS 2 AND 3

Dear Mr. Herrington:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by South Carolina Electric and Gas Company (SCE&G) acting for itself, and as an agent for Santee Cooper for combined licenses (COLs) for construction and operation of two new nuclear power plants at its Virgil C. Summer Nuclear Station (VCSNS) site in Fairfield County, South Carolina. The U.S. Army Corps of Engineers (USACE), Charleston District, is reviewing an application from SCE&G for a Department of the Army (DA) permit to perform site preparation activities to build the reactors and supporting structures. The USACE is cooperating with the NRC to prepare a single environmental impact statement (EIS) for these proposed actions under the National Environmental Policy Act of 1969, as amended, that meets the requirements of both agencies.

As part of the agencies' responsibilities under Section 7 of the Endangered Species Act, the NRC and USACE prepared a biological assessment (BA) to document potential impacts on Federally listed threatened or endangered species from the proposed actions. The BA was prepared as an appendix to a draft EIS issued in April 2010. The draft EIS and BA were provided to the U.S. Fish and Wildlife Service (FWS) by letter dated April 15, 2010 (ML100840375). The draft EIS and BA are available through the NRC's Agencywide Document Management System (ADAMS) which is accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html> through the accession numbers ML101000010 and ML101000011. The draft EIS can also be found on the NRC's Summer website at <http://www.nrc.gov/reactors/new-reactors/col/summer.html>.

In a letter dated July 26, 2010 (ML102160401), the FWS provided comments on the draft EIS and BA to the NRC that included recommendations for incorporating final corridor alignments for the new transmission lines and species/habitat impact analyses for each alignment. The enclosed supplement to the BA provides the requested information and analyses.

The NRC and the USACE staffs request concurrence with the determinations found in the attached supplement to the BA. In reaching our conclusions, the NRC and USACE staffs relied on information provided by the applicant, analysis performed by NRC and USACE staffs, and on information supplied by FWS.

J. Herrington

-2-

Please note that while this is a joint consultation, the NRC and USACE have different regulatory authorities. In the event that an Incidental Take Statement is issued, please specify which terms and conditions are imposed on which agency. In consideration of the circumstances surrounding this application, the NRC's final EIS schedule, the USACE's decision schedule and your familiarity with the proposed project, the NRC and USACE request that you provide your response within 30 days of the date of this letter.

If you have any questions or require additional information, please contact Ms. Patricia Vokoun, Environmental Project Manager, by phone at 301-415-3470 or via email at [Patricia.Vokoun@nrc.gov](mailto:Patricia.Vokoun@nrc.gov).

Sincerely,



Ryan Whited, Branch Chief  
Environmental Projects Branch 2  
Division of Site and Environmental Reviews  
Office of New Reactors

Docket Nos: 52-027 and 52-028

Enclosure:  
As stated

cc w/enclosures.:  
See next page



## Appendix F



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 10, 2011

Mr. David Bernhart  
Assistant Regional Administrator for Protected Resources  
National Marine Fisheries Service  
Southeast Regional Office  
263 13th Avenue South  
St. Petersburg, FL 33701

SUBJECT: SUPPLEMENT TO THE BIOLOGICAL ASSESSMENT RELATED TO THE  
REVIEW OF THE COMBINED LICENSES APPLICATION FOR THE VIRGIL C.  
SUMMER NUCLEAR STATION, UNITS 2 AND 3

Dear Mr. Bernhart:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by South Carolina Electric and Gas Company (SCE&G), acting for itself and as an agent for Santee Cooper, for combined licenses for construction and operation of two new nuclear power plants at its Virgil C. Summer Nuclear Station site in Fairfield County, South Carolina. The U.S. Army Corps of Engineers (USACE), Charleston District, is reviewing an application from SCE&G for a Department of the Army permit to perform site preparation activities to build the reactors and supporting structures as well as to install the new transmission lines servicing the new reactors. The USACE is cooperating with the NRC to prepare a single environmental impact statement (EIS) for these proposed actions under the National Environmental Policy Act of 1969, as amended, that meets the requirements of both agencies.

As part of the agencies' responsibilities under Section 7 of the Endangered Species Act, the NRC and USACE prepared a biological assessment (BA) to document potential impacts on Federally listed threatened or endangered species from the proposed actions. The BA was prepared as an appendix to a draft EIS issued in April 2010. The draft EIS and BA were provided to the National Marine Fisheries Service (NMFS) by letter dated April 15, 2010 (ML100840634). The draft EIS and BA are available through the NRC's Agencywide Document Management System (ADAMS) which is accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html> through the accession numbers ML101000010 and ML101000011. The draft EIS can also be found on the NRC's Summer website at <http://www.nrc.gov/reactors/new-reactors/col/summer.html>.

In a letter dated July 19, 2010 (ML102070376), the NMFS provided comments on the draft EIS to the NRC that included recommendations to consider more thoroughly the potential long-term effects of the proposed actions on protection, management, and restoration of important diadromous fishery resources and on the survival and recovery of the endangered shortnose sturgeon (*Acipenser brevirostrum*) in the area of direct and indirect project influence and the Santee-Cooper River Basin. The enclosed supplement to the BA provides the requested information and analyses.

The NRC and the USACE staffs request concurrence with the determinations found in the supplement to the BA. In reaching our conclusions, the NRC and USACE staffs relied



D. Bernhart

-2-

on information provided by the applicant, analysis performed by NRC and USACE staffs, and on information supplied by NMFS and the U.S. Fish and Wildlife Service. Please note that while this is a joint consultation, the NRC and USACE have different regulatory authorities. In the event that an Incidental Take Statement is issued, please specify which terms and conditions are imposed on which agency. In consideration of the circumstances surrounding this application, the NRC's final EIS schedule, the USACE's decision schedule, and your familiarity with the proposed project, the NRC and USACE request that you provide your response within 21 days of the date of this letter.

If you have any questions or require additional information, please contact Ms. Patricia Vokoun, Environmental Project Manager, by phone at 301-415-3470 or via email at [Patricia.Vokoun@nrc.gov](mailto:Patricia.Vokoun@nrc.gov).

Sincerely,



Ryan Whited, Branch Chief  
Environmental Projects Branch 2  
Division of Site and Environmental Reviews  
Office of New Reactors

Docket Nos: 52-027 and 52-028

Enclosure:  
As stated

cc w/enclosures.:  
See next page

Appendix F



United States Department of the Interior

**FISH AND WILDLIFE SERVICE**

176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407



March 14, 2011

Mr. Ryan Whitehead, Branch Chief  
Environmental Projects Branch  
Division of Site and Environmental Reviews  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Attn: Patricia Vokoun

Re: Biological Assessment, Virgil C. Summers Nuclear Station, Fairfield County, SC  
FWS Log No. 42410-2011-I-0177

Dear Mr. Whitehead:

The U.S. Fish and Wildlife Service (Service) has received the Nuclear Regulatory Commission's (NRC) supplemental information to the Biological Assessment (BA) regarding the placement of transmission lines associated with the construction of two new reactors at the V. C. Summer Nuclear Station, Fairfield County, South Carolina. The supplemental information to the BA (Supplement) was submitted to address potential impacts the facility's transmission lines may have upon federally protected habitat and species. Your request is being made as required by the National Environmental Policy Act of 1969, the Endangered Species Act of 1973 (Act) and the Fish and Wildlife Coordination Act of 1934.

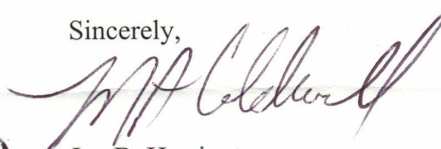
As detailed in the Supplement, multiple threatened and endangered species (T&E) and their habitat may be found along the transmission line corridors. A total of twelve T&E species, eight plants and four animal species, may be impacted through the placement of additional lines to an existing corridor or through the placement of new lines along a new corridor. One of the lines to be upgraded crosses a portion of Flat Creek that is considered critical habitat for the endangered freshwater mussel, the Carolina heelsplitter. The NRC Supplement reviewed each of the T&E species and their habitat requirements within the corridors and determined that a 'may affect, but not likely to adversely affect' conclusion is appropriate for all twelve species. Further, the lines will not adversely modify critical habitat for the Carolina heelsplitter.

Based upon information provided in the Supplement the Service concurs that the construction and placement of the proposed transmission lines are not likely to adversely affect species

currently protected by the Act nor adversely modify critical habitat. Please note that obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner which was not considered in this assessment, or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

If you have any questions regarding the Service's determination, please do not hesitate to contact Mark Caldwell at 843-727-4707 (ext. 215).

Sincerely,



*J.B. Herrington*

Jay B. Herrington  
Field Supervisor

JBH/MAC

## **Biological Assessment**

**U.S. Fish and Wildlife Service**

### **Virgil C. Summer Nuclear Station Combined License Application**

The following biological assessment was prepared as part of informal consultation with the U.S. Fish and Wildlife Service (FWS) and published in draft NUREG-1939 in April 2010. Since then, the applicant provided refined transmission-line routing and updated information on Federally listed species in the refined routes. Subsequent consultation with FWS is documented in the correspondence section of this appendix.

# **Biological Assessment**

**U.S. Fish and Wildlife Service**

## **Virgil C. Summer Nuclear Station Combined License Application**

**U.S. Nuclear Regulatory Commission Combined License Application**  
Docket No. 52-027 and 52-028

**U. S. Army Corps of Engineers Permit Application**  
Permit Application No. SAC 2007-1852-SIR (Virgil C. Summer Nuclear  
Station Units 2 and 3, South Carolina Electric & Gas)

Fairfield County, South Carolina

April 2010

U.S. Nuclear Regulatory Commission  
Rockville, Maryland

U.S. Army Corps of Engineers  
Charleston District

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## Abbreviations/Acronyms

ac	acre(s)
AP1000	Advanced Passive 1000
BMP	best management practice
CBS	Carnagey Biological Services
CFR	Code of Federal Regulations
cfs	cubic foot/feet per second
cm	centimeter(s)
COL	combined construction permit and operating license
DA	Department of the Army
EIS	environmental impact statement
ER	Environmental Report
EPA	U.S. Environmental Protection Agency
EPT	Ephemeroptera, Plecoptera, and Trichoptera
ESA	Endangered Species Act of 1973, as amended
°F	degree(s) Fahrenheit
FP&S	Facilities Planning & Siting, PLLC
fps	foot/feet per second
FPSF	Fairfield Pumped Storage Facility
FR	<i>Federal Register</i>
ft	foot/feet
FWPCA	Federal Water Pollution Control Act
FWS	U.S. Fish and Wildlife Service
kV	kilovolt(s)
m	meter(s)
mi	mile(s)
mi <sup>2</sup>	square mile(s)
NEPA	National Environmental Policy Act of 1969, as amended
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCE&G	South Carolina Electric & Gas
SWPPP	stormwater pollution prevention plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
VCSNS	Virgil C. Summer Nuclear Station



## 1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from South Carolina Electric & Gas (SCE&G) for combined NRC-authorized construction permits and operating licenses (COLs) to build and operate two Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive 1000 (AP1000) pressurized water reactors (Units 2 and 3) on the site of the Virgil C. Summer Nuclear Station (VCSNS) in Fairfield County, South Carolina. The U.S. Army Corps of Engineers (USACE) is reviewing an application from SCE&G for a Department of the Army (DA) Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344) to perform site-preparation activities to build the reactors and supporting structures. The USACE is cooperating with NRC to prepare an environmental impact statement (EIS) under the National Environmental Policy Act of 1969, as amended, (NEPA) and ensure that the EIS is adequate to fulfill the requirements of USACE regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the substantive environmental criteria used by the USACE in evaluating discharges of dredged or fill material into waters of the United States; and the USACE public interest review process. The NRC and the USACE have prepared this biological assessment to support a joint consultation with the U.S. Fish and Wildlife Service (FWS) in accordance with the Endangered Species Act of 1973, as amended (ESA). The USACE permit decision will be made following issuance of the final EIS.

Currently, there is one operating nuclear reactor, Unit 1, on the VCSNS site. Proposed Units 2 and 3 would be located approximately 4700 ft south and 1800 ft west, respectively, of the center of the existing Unit 1 containment building. The VCSNS is situated approximately 26 mi northwest of Columbia, South Carolina.

The USACE and the NRC are conducting a joint consultation and have prepared this biological assessment, which examines the potential impacts of building and operating the proposed Units 2 and 3 at the VCSNS site on threatened or endangered species pursuant to ESA Section 7(c). This biological assessment examines the effects of the proposed action on the Federally endangered species presented in Table 1-1, which are known to occur in the counties in South Carolina that include the VCSNS site or would be crossed by the proposed transmission system required to transmit power from the proposed new units. The proposed transmission routes are shown in Figure 1-1.

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**Table 1-1.** Federally Listed Species Known to Occur in Counties That Include VCSNS Site and Vicinity or That Would Be Crossed by Proposed Transmission Lines

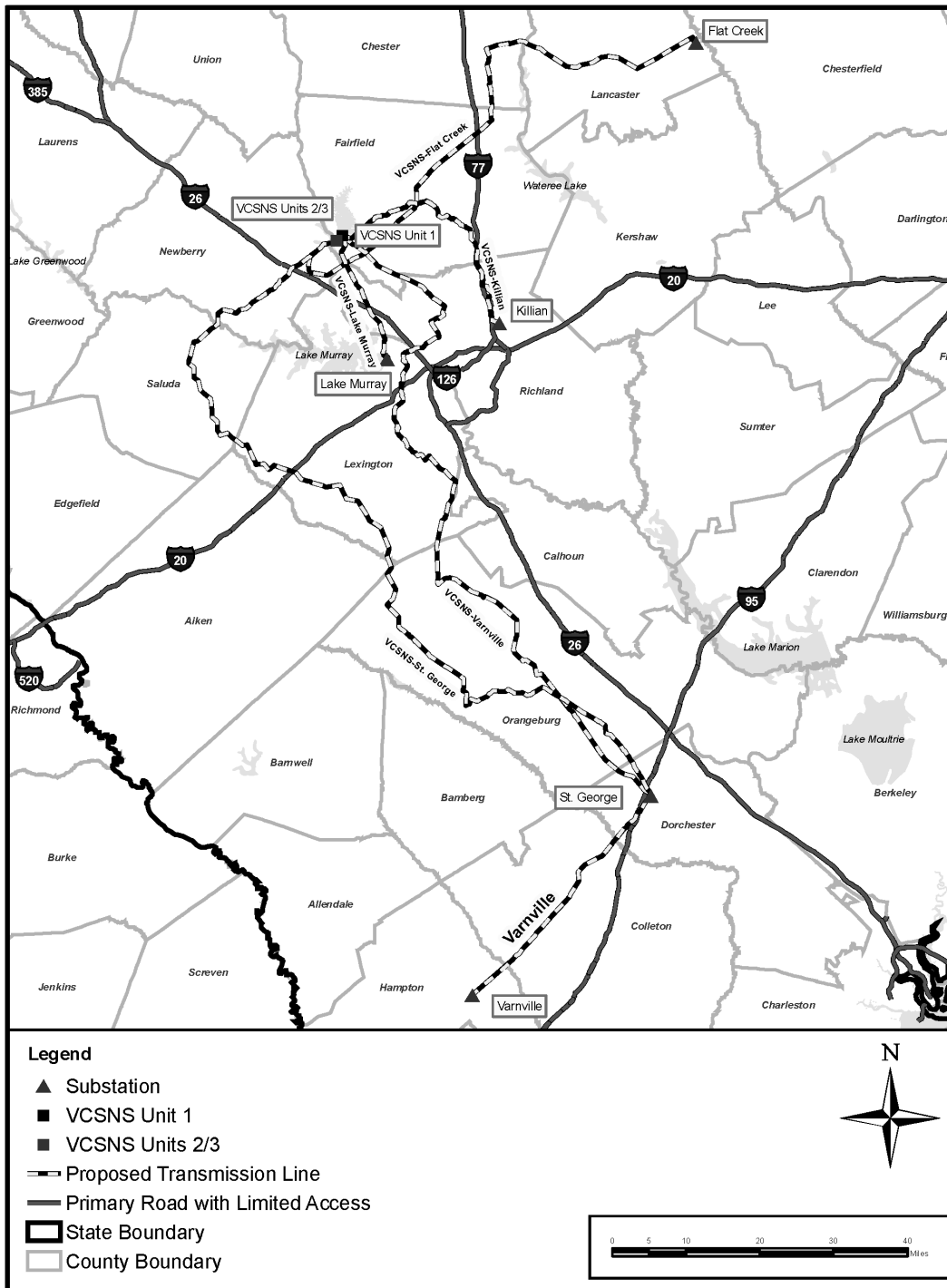
Scientific Name	Common Name	Legal Status	County
<b>Birds</b>			
<i>Charadrius melodus</i>	Piping plover	T	Colleton
<i>Mycteria americana</i>	Wood stork	E	Aiken, Bamberg, Colleton, Dorchester, Hampton, Newberry, Richland
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Aiken, Bamberg, Calhoun, Chester, Colleton, Dorchester, Hampton, Lexington, Orangeburg, Richland, Saluda
<b>Amphibians</b>			
<i>Ambystoma cingulatum</i>	Flatwoods salamander	T	Orangeburg
<b>Mollusks</b>			
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	Chester, Fairfield, Lancaster, Richland, Newberry, Saluda, Lexington
<b>Vascular Plants</b>			
<i>Amphianthus pusillus</i>	Pool sprite	T	Lancaster, Saluda
<i>Aster georgianus</i>	Georgia aster	C	Chester, Fairfield, Richland
<i>Echinacea laevigata</i>	Smooth coneflower	E	Aiken, Lancaster, Lexington, Richland
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	Lancaster
<i>Isoetes melanospora</i>	Black-spored quillwort	E	Lancaster
<i>Lindera melissifolia</i>	Pondberry	E	Dorchester
<i>Lysimachia asperulifolia</i>	Rough-leaved loosestrife	E	Richland
<i>Narthecium americanum</i>	Bog asphodel	C	Dorchester
<i>Oxypolis canbyi</i>	Canby's dropwort	E	Bamberg, Colleton, Dorchester, Hampton, Orangeburg, Richland
<i>Ptilimnium nodosum</i>	Harperella	E	Aiken, Saluda
<i>Trillium reliquum</i>	Relict trillium	E	Aiken

Sources: SCDNR 2006a, FWS 2008a

T = Federal Threatened

E = Federal Endangered

C = Federal Candidate



**Figure 1-1.** VCSNS Units 2 and 3 Potentially Affected Transmission-Line Corridors (SCE&G 2009a)

## **2.0 VCSNS Site Description**

The VCSNS site is located in Fairfield County, South Carolina, approximately 26 mi northwest of Columbia, South Carolina (Figure 2-1). The site is in a sparsely populated, largely rural area, with forests and small farms composing the dominant land use.

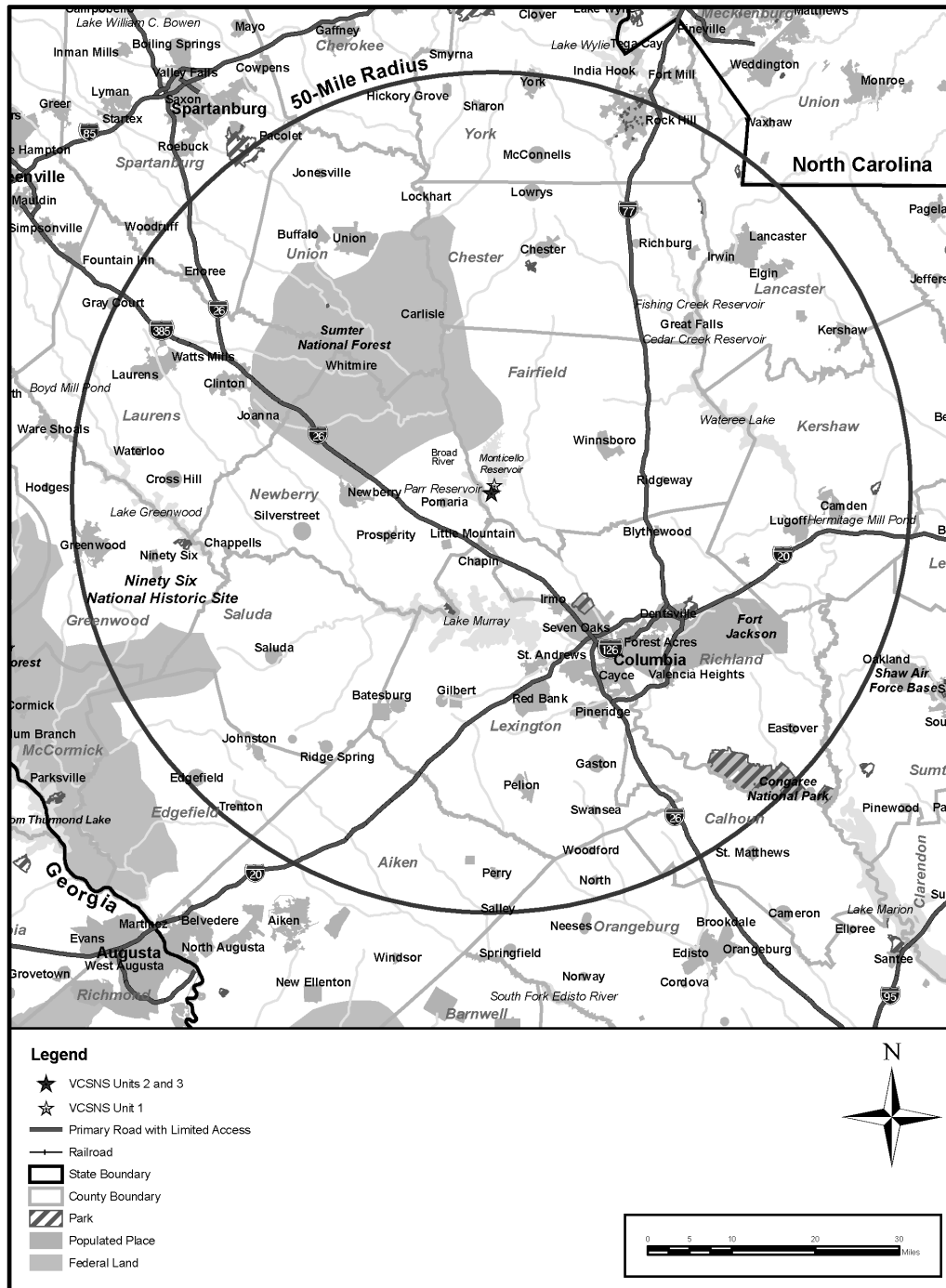
### **2.1 Terrestrial Habitats – Site and Vicinity**

The terrestrial communities found on the VCSNS site and vicinity are characteristic of those found in the Southern Outer Piedmont ecoregion (Griffith et al. 2002). The surrounding landscape consists of gently rolling hills and valleys dissected by an abundance of streams. Vegetation communities common in the Southern Outer Piedmont ecoregion include mixed oak forest and oak-hickory-pine forest. The dominant cover types present on the VCSNS site are pine and mixed pine-hardwood forests, with a small portion of hardwood forests associated with steep slopes and stream bottoms (SCE&G 2009a). The VCSNS site is primarily a human-altered system that has changed dramatically since the damming of the Broad River and Frees Creek, which created Parr and Monticello reservoirs, respectively. Wetlands present on the VCSNS site are typical of those found in the South Carolina Piedmont and include both palustrine (marshes, bogs, fens, etc.) and lacustrine (on the shores of lakes and/or reservoirs) wetlands. Most of the wetlands are forested and are associated with small streams, seeps, and beaver ponds (SCE&G 2009a).

Terrestrial wildlife species found on the VCSNS site are typical of those found in the Southern Outer Piedmont ecoregion of South Carolina. A variety of species inhabit the forested, wetland, and open water habitats present, including amphibians, reptiles, birds, and mammals. Recent biological surveys of the site have been conducted in support of VCSNS Unit 1 license renewal (SCE&G 2002) and more recently to provide information regarding potential occurrences of threatened and/or endangered species on the VCSNS site (Tetra Tech NUS, Inc. 2008, 2009; Nelson 2006, 2007). Informal observations of wildlife and vegetation were made and noted during those surveys. Ecological monitoring data collected in the early 1970s to mid-1980s were also reviewed to provide additional information regarding the wildlife likely to be observed on the VCSNS site and vicinity. The proposed project site for VCSNS Units 2 and 3 is within the current VCSNS Unit 1 plant boundary just south of existing Unit 1, in an area that was cleared and used for storage, spoils disposal, and laydown areas during the building of Unit 1 (SCE&G 2009a).

### **2.2 Aquatic Habitats – Site and Vicinity**

The major aquatic environments within the vicinity of proposed VCSNS Units 2 and 3 include the Broad River, Monticello and Parr reservoirs, and Mayo Creek. Mayo Creek is the largest stream within the site vicinity and it receives drainage from several small seasonal tributary channels. The Monticello and Parr reservoirs are the largest waterbodies near the site (Figure 2-2).



**Figure 2-1.** VCSNS Site Location in Relationship to the Counties and Cities Within a 50-Mi Radius of the Site (SCE&G 2009a).

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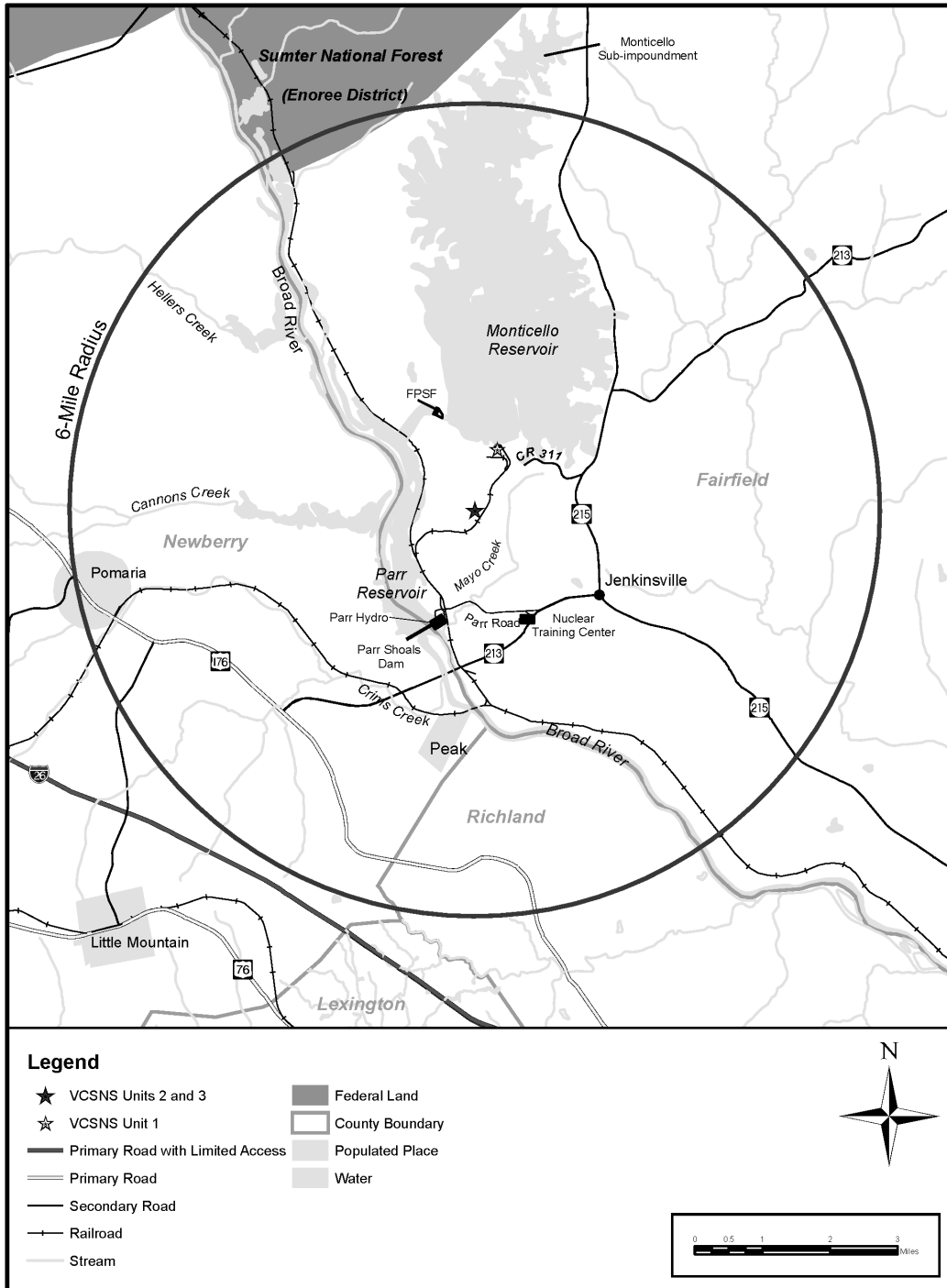


Figure 2-2. Map of the VCSNS Site and Vicinity Within a 6-Mi Radius (SCE&G 2009a).

### 2.2.1 Broad River

The Broad River basin encompasses approximately 2400 mi<sup>2</sup> and 27 watersheds within the State of South Carolina and includes almost 2800 mi of streams and more than 14,500 ac of lakes. The basin falls within the boundaries of seven counties in the state: Cherokee, Spartanburg, York, Union, Chester, Fairfield, and Richland (SCDHEC 2007). Within the State of South Carolina, the Broad River basin is entirely within the Piedmont ecoregion. The Piedmont is characterized by gently rolling to hilly terrain, with relatively confined stream valleys, and elevations ranging from 375 to 1000 ft above mean sea level. Major tributaries of the Broad River basin include the Tyger and Enoree rivers, which intersect the Broad River from the west (SCE&G 2009a). Of the 1.5 million ac associated with the basin, more than 60 percent are forested, with approximately 24 percent used for agriculture, and less than 10 percent classified as urban development (SCDHEC 2007). As shown in Figure 2-2, the Broad River flows south along the Sumter National Forest and flows to the west of the VCSNS site. A run-of-the-river impoundment along the Broad River near the vicinity of the VCSNS forms the Parr Reservoir.

### 2.2.2 Parr Reservoir

As described by SCE&G (2009a), the Parr Reservoir was created in 1914 by installing a 2000-ft-long dam across the Broad River at Parr Shoals (Figure 2-2). The purpose of the dam was to provide a pool for the original Parr Hydroelectric Generating Station (or Parr Hydroelectric Plant). Before 1977, the surface area of the reservoir was 1850 ac. In 1977, the reservoir level was raised 9 ft, which increased the surface area to approximately 4400 ac, to accommodate the operation of the Fairfield Pumped Storage Facility (FPSF) (SCE&G 2009a). Parr Reservoir is approximately 7 mi long and has an average water depth of 15 ft (SCE&G 2009a). Because of the operation of the FPSF, hydrologic patterns in the Parr Reservoir are variable. Generally, water from the Monticello Reservoir is released through the FPSF into Parr Reservoir throughout the day and early evening to provide hydroelectric power at Parr Shoals Dam, resulting in a net southward flow in Parr Reservoir. During the night, when electrical demand is lower, water from Parr Reservoir is pumped upward into the Monticello Reservoir, reversing the flow to the north in Parr Reservoir (SCE&G 2009a).

Water-quality monitoring was performed at an upstream site, above the intake/discharge canal for the FPSF and at a downstream site in the forebay near the Parr Shoals Dam. According to South Carolina Department of Health and Environmental Control (SCDHEC 2007) water-monitoring results, water conditions were not optimal to support aquatic life at these two stations on Parr Reservoir. The total phosphorus concentrations at the upstream site above the intake/discharge canal for the FPSF were found to exceed the standards for supporting optimal use by aquatic life. At the downstream site, elevated copper concentrations were deemed to exceed the aquatic life criterion, and therefore were not optimal to support aquatic life at this site (SCDHEC 2007).

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Between 2006 and 2009, SCE&G conducted intermittent inventories of fish community composition near the vicinity of the VCSNS site near the proposed discharge location (see Figure 2-3). Sampling efforts used a combination of boat electrofishing, gillnets, and hoop nets and documented 28 species of fish in Parr Reservoir. Gizzard shad (*Dorosoma cepedianum*) was the most abundant species, representing over 18 percent of the total catch, with bluegill (*Lepomis macrochirus*), threadfin shad (*D. petenense*), channel catfish (*Ictalurus punctatus*), and white perch (*Morone americana*) also caught in abundance (data derived from Normandeau 2007, 2008, 2009; Quattlebaum 2008a).

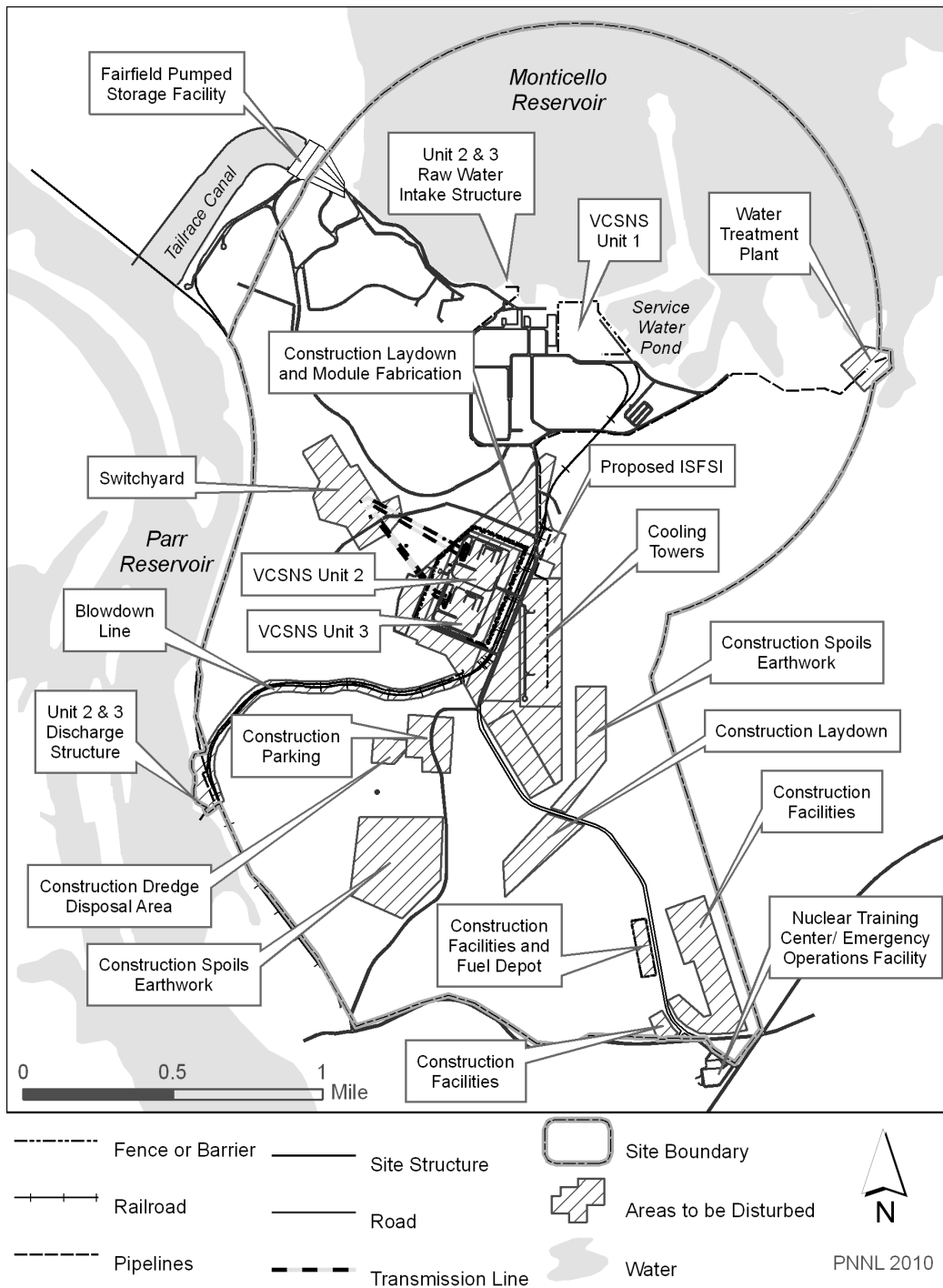
To examine the benthic community in Parr Reservoir, Carnegie Biological Services (CBS) collected benthic invertebrates near the proposed location of the discharge structure for Units 2 and 3 (approximately 1 km upstream of Parr Shoals Dam) and at an upstream control station approximately 9 km upstream of Parr Shoals Dam. Sediments were characterized as sandy. Seasonal (e.g., quarterly) monitoring occurred for 1 year between 2008 and 2009 (CBS 2008a, c, 2009c, d). The bioassessment metrics included taxa richness, various biotic indices (e.g., Ephemeroptera, Plecoptera, and Trichoptera [EPT] index, North Carolina biotic index), and comparisons of functional groups and abundances described by Plafkin et al. (1989) in *Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish*. The survey efforts yielded at least 22 different taxa from 8 orders. The Asian clam (*Corbicula fluminea*) and a species of pea clam (family Sphaeriidae) were the only mollusks collected during these benthic surveys (CBS 2008a, c, 2009c, d).

### 2.2.3 Monticello Reservoir

The Monticello Reservoir was formed in 1977 by damming Frees Creek, a small tributary of the Broad River that flowed into Parr Reservoir approximately 1 mi upstream from the Parr Shoals Dam SCE&G (2009a). The reservoir is hydraulically connected to the Parr Reservoir via the FPSF and it serves both as an upper pool for the FPSF and as a cooling pond for VCSNS Unit 1 (NRC 2004) (Figure 2-2). To the northeast, the reservoir contains a subimpoundment (Figure 2-4), which is a 300-ac area owned by SCE&G and co-managed by SCE&G and the South Carolina Department of Natural Resources (SCE&G 2009a; SCDNR 2002) The Monticello Reservoir, excluding the subimpoundment, is approximately 6 mi long and has a total surface area of 6500 ac. The average water depth is 59 ft and the maximum depth is approximately 126 ft (SCE&G 2009a).

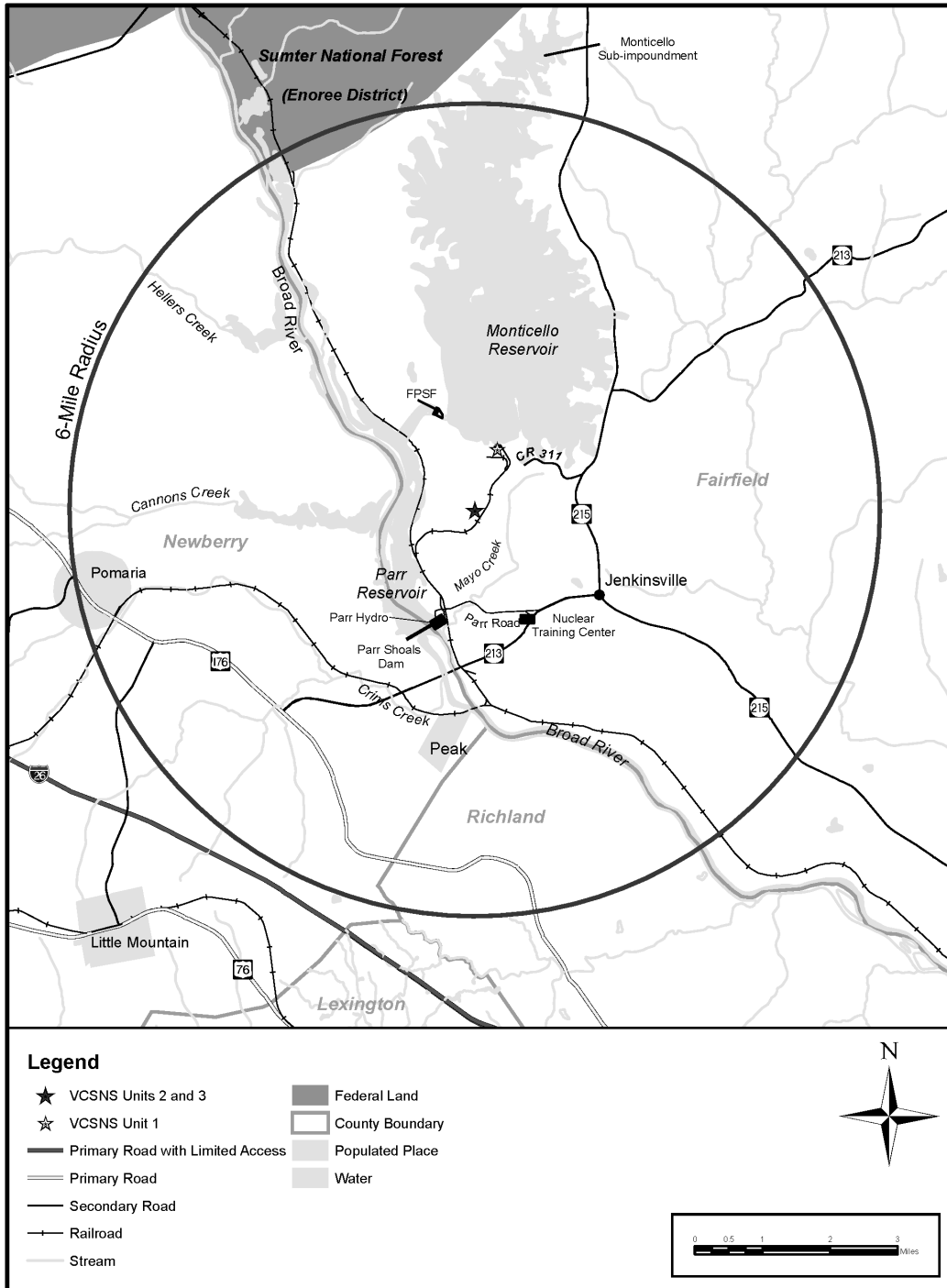
Between 2000 and 2004, the SCDHEC evaluated the water quality in the Broad River basin to assess the overall health and condition of aquatic areas throughout the basin. Three stations within Monticello Reservoir (excluding the subimpoundment) were assessed for dissolved oxygen, pH, turbidity, chemicals, and nutrients. Benzoic acid, cadmium, nickel, chromium, copper, zinc, bis(n-octyl) phthalate, and derivatives of pesticides were detected in the sediment samples. Despite the occurrence of these chemical constituents, recreational use was not restricted and water conditions were considered optimal for aquatic life near these stations (SCDHEC 2007).





**Figure 2-3.** SCE&G's Proposed Location for VCSNS Units 2 and 3

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**Figure 2-4.** Map of the VCSNS Site and Vicinity Within the 6-Mi Radius (SCE&G 2009a)

Between 2006 and 2009, SCE&G initiated inventories of fish community composition near the vicinity of the VCSNS site. The sampling effort used a combination of boat electrofishing, gillnets, and hoop nets and documented 24 fish species in Monticello Reservoir, excluding the subimpoundment. The most predominant species captured in the Monticello Reservoir between 2006 and 2009 included bluegill (29 percent of the total catch), gizzard shad (25 percent), blue catfish (*Ictalurus furcatus*) (13 percent), and white perch (10 percent) (Normandeau 2007, 2008, 2009).

To examine the benthic community in Monticello Reservoir, CBS collected macroinvertebrate samples at three stations in the reservoir. The reference station was located approximately 3 mi northwest of the VCSNS site. Two additional stations were located at the south end of the reservoir near the proposed Units 2 and 3 water-treatment intake and raw-water intake structures, respectively (CBS 2009d). Sediments were characterized as a mixture of sand and clay. Seasonal (e.g., quarterly) monitoring occurred from July 2008 to April 2009 (CBS 2008a, c, 2009c, d). Results were evaluated using a combination of bioassessment metrics and analyzed using statistical comparison techniques. The survey efforts yielded at least 15 different taxa from 11 orders (CBS 2008a, c, 2009c, d). The Asian clam, the eastern elliptio (*Elliptio complanata*), and the eastern floater (*Pyganodon cataracta*) were the only mollusks collected during these benthic surveys (CBS 2008a, c, 2009c, d).

#### **2.2.4 Onsite Streams**

There are 49,288 linear feet of streams within the VCSNS site boundary. Most onsite streams are seasonal. Mayo Creek is the primary perennial stream located on the VCSNS site. Tetra Tech NUS, Inc. (2007) describes Mayo Creek as a typical Piedmont stream characterized by flowing through a mixed hardwood forest, almost completely shaded by tree canopy. The creek originates 0.5 mi southeast of VCSNS Unit 1 and flows approximately 3.6 mi southwest before draining into the Broad River, downstream of the Parr Shoals Dam (Figure 2-2). The Mayo Creek drainage area is approximately 6 mi<sup>2</sup> and encompasses mixed hardwood forests that may mitigate surface-water temperatures during warm summer months (Tetra Tech NUS, Inc. 2007; SCE&G 2009a). In addition to Mayo Creek, there are intermittent and seasonal stream channels within the VCSNS site vicinity. Mayo Creek is characterized by sandy sediments in pools along small tributaries, and gravel/cobble mixture on sand in stream locations with well-developed canopy with riffle-run habitats (Tetra Tech NUS, Inc. 2009).

The results of water-quality parameters measured in conjunction with four seasonal sampling events that occurred between July 2006 and July 2009 indicate that all sampling stations in Mayo Creek met the SCDHEC quality standards for temperature and dissolved oxygen in freshwater habitats (Tetra Tech NUS, Inc. 2007, 2009; Quattlebaum 2008b; CBS 2008b, 2009a, b). The SCDHEC freshwater classification standards, which are approved by the U.S. Environmental Protection Agency (EPA) (in accordance with Section 303(c) of the Clean Water

## Appendix F

Act and Title 40 of the Code of Federal Regulations [CFR] Part 131), indicate the suitability of a waterbody for various purposes including the sustainability of aquatic biota (SCDHEC 2004).

Fish surveys were conducted in Mayo Creek throughout the lower, middle, and upper stream segments and within a tributary channel of the creek. Methods for fish sampling included minnow traps and backpack electrofishing over sampling transects ranging from 166 to 205 ft (Tetra Tech NUS, Inc. 2007, 2009; Quattlebaum 2008b). A total of 16 taxa were sampled during the 2006–2009 fish surveys. Predominant species included yellowfin shiner (*Notropis lutipinnis*), bluehead chub (*Nocomis leptcephalus*), sandbar shiner (*Notropis szepticus*), and redbreast sunfish (*Lepomis auritus*) the predominant species.

Benthic macroinvertebrates were sampled seasonally from three stations in Mayo Creek between July 2008 and April 2009. The intent of the assessments was to evaluate the community of macroinvertebrates and assess stream conditions (CBS 2008b, d, 2009a, b). The first station was the most upstream site sampled on Mayo Creek and located approximately 1 mi upstream of Parr Road. The second site was approximately 0.12 mi upstream of Parr Road on Mayo Creek, and the third station was located 164 ft downstream of Parr Road (CBS 2009b). Results were evaluated using a combination of bioassessment metrics and analyzed using statistical comparison techniques. During the survey efforts at least 43 taxa were encountered, representing 14 orders. The Asian clam was the only mollusk collected during the CBS sampling efforts (CBS 2008b, d, 2009a, b), and only Asian clam shells were collected during the fish and mussel surveys in 2009 by Tetra Tech NUS, Inc. (2009).

### **2.3 Terrestrial and Aquatic Habitats – Transmission Line Corridors**

The delivery of power associated with VCSNS Units 2 and 3 would require upgrading existing transmission-line corridors and installing new corridors, transmission lines, and substations. Two entities, SCE&G and Santee Cooper (the State-owned electric and water utility, formally called the South Carolina Public Service Authority), are responsible for identifying the proposed locations associated with new and upgraded transmission lines. In total, six new 230-kV lines are proposed for the transmission of electricity associated with proposed VCSNS Units 2 and 3. The six new lines cover five proposed corridors that occur in the Southern Outer Piedmont, Sandhills and Coastal Plain ecoregions, and span areas containing only freshwater features with no marine waters (FP&S 2008; MACTEC 2008). Systematic terrestrial and aquatic surveys were not included as part of the transmission-line site-selection process. In the absence of empirical data, reconnaissance-level information pertaining to species designated as endangered or threatened associated with the counties in which the transmission lines would occur was derived from the FWS records (FWS 2008a) and the South Carolina Heritage Trust Program (SCDNR 2006a).

### 3.0 Proposed Federal Actions

The proposed Federal actions are NRC's issuance of two COLs for the construction and operation of two new nuclear reactors at the VCSNS site pursuant to 10 CFR Part 52 and the USACE's issuance of a DA permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Appropriation Act of 1899.

Prerequisites to certain NRC-authorized construction activities include, but are not limited to, documentation of existing site conditions within the VCSNS site and acquisition of the necessary permits (e.g., COL, local building permits, a National Pollutant Discharge Elimination System [NPDES] permit [40 CFR Part 122], a Clean Water Act Section 404 permit, a General Stormwater Permit, and other State and local permits). After these prerequisites are completed, planned building activities could proceed and would include all or some of the activities pursuant to 10 CFR 50.10(e)(1). Following building, the planned operation of the new reactors would be authorized if the Commission finds, under 10 CFR 52.103(g), that all acceptance criteria in the COLs are met.

The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of "construction" to the activities that fall within its regulatory authority in 10 CFR 51.4. Many of the activities required to build a nuclear power plant are not part of the NRC action to license the plant. Activities associated with building the plant that are not within the purview of the NRC action are grouped under the term "preconstruction." Preconstruction activities include clearing and grading, excavating, erecting support buildings and transmission lines, and other associated activities. These preconstruction activities may take place before the application for a COL is submitted, during the staff's review of a COL application, or after a COL is granted. Although preconstruction activities are outside the NRC's regulatory authority, many of them are within the regulatory authority of local, State, or other Federal agencies. The distinction between construction and preconstruction is not carried forward in this biological assessment; they are being discussed together as construction activities in this Section 7 consultation.

The USACE regulatory program was originally established pursuant to the Rivers and Harbors Appropriation Acts of 1890 (superseded) and 1899 (33 USC Sec. 401 et seq.). Various sections establish permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States, with the most frequently exercised USACE authority contained in Section 10 (33 USC Sec. 403). This section covers construction, excavation, or deposition of materials in, over, or under such waters, or any work that would affect the course, location, condition, or capacity of those waters. In 1972 and in 1977, amendments to the Federal Water Pollution Control Act (FWPCA), known as the Clean Water Act, added "Section 404" authority (33 USC Sec. 1344) authorizing the USACE to issue permits for the discharge of material into waters of the United States at specified disposal sites. Selection of such sites must be in accordance with guidelines developed by the EPA in conjunction with the DA. These guidelines

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are known as the 404(b)(1) Guidelines for the specification of disposal sites for dredged or fill material. The discharge of all other pollutants into waters of the United States is regulated under Section 402 of the FWPCA.

Briefly, the construction and operation activities that could affect the protected terrestrial and freshwater species based on habitat affinities and life-history characteristics, and the nature and spatial and temporal considerations of the activity are as follows:

- Terrestrial
  - Construction
    - Onsite clearing, grading, and other site-preparation and construction activities
    - Clearing for expansion of existing transmission-line corridors
    - Clearing for new transmission-line corridors
    - Installation of new or upgraded transmission lines and towers
  - Operation
    - Vegetation control in transmission-line corridors
    - Transmission line repairs or upgrades
- Aquatic
  - Construction
    - Installation of raw-water intake and water-treatment intake in Monticello Reservoir
    - Installation of cooling-water blowdown discharge structure in Parr Reservoir
    - Preparation of stormwater ponds
    - Filling of headwater tributary to Mayo Creek
    - Clearing for expansion of existing transmission-line corridors
    - Clearing for new transmission-line corridors
    - Installation of new or upgraded transmission lines and towers
  - Operation
    - Impingement and entrainment of organisms at raw-water and water-treatment intakes in Monticello Reservoir
    - Discharge plume from the cooling-water system (thermal, chemical, and physical effects)
    - Vegetation control in transmission-line corridors
    - Transmission-line repairs or upgrades.

## 3.1 Impacts from Construction and Operation Onsite

The impacts from the proposed construction and operation on onsite terrestrial and aquatic resources were assessed, as described in the following sections.

### 3.1.1 Terrestrial

Impacts on terrestrial resources on the VCSNS site would include loss of habitat (temporary and permanent), presence of humans, heavy equipment operation, traffic, noise, avian collisions, outdoor lighting, and fugitive dust. These activities would likely displace or destroy wildlife that inhabits the development areas. Larger and more mobile animals would likely flee the area, while less mobile animals such as reptiles, amphibians, and small mammals would be at greater risk of incurring mortality. Although the surrounding forest and wetland habitat would be available for displaced animals, the movement of wildlife into surrounding areas would increase competition for available space and could result in increased predation and decreased fecundity for certain species. These conditions could lead to a temporary localized reduction in population size for particular species. When site preparation and construction activities are completed, species that can adapt to disturbed or developed areas may readily re-colonize portions of the site where suitable habitat remains, is replanted, or restored.

The construction footprint for proposed Units 2 and 3 and all associated facilities would encompass approximately 490 ac within the plant boundary (SCE&G 2009a). Approximately 137 ac outside the plant boundary would be used for temporary facilities, laydown areas, and spoils-disposal areas (SCE&G 2009a). Approximately 120 ft of shoreline on the Parr Reservoir would be temporarily disturbed to install the blowdown discharge structure, and installation of the raw- (makeup-) water intake from Monticello Reservoir would temporarily disturb approximately 175 ft of shoreline (SCE&G 2009a). In addition, approximately 1916 ac of new transmission-line corridor land would be cleared of forest and planted with grass to accommodate the proposed six new 230-kV transmission lines. No Federally listed threatened or endangered species are known to occur in, or are likely to inhabit, the affected or directly adjoining habitats.

SCE&G stated it would develop and follow a Construction Environmental Controls Plan, which would include compliance with applicable local, State, and Federal ordinances, laws, etc., to prevent or minimize potential impacts (SCE&G 2009a). Other environmental-management controls, such as meeting the requirements of existing permits and use of best management practices (BMPs), would be implemented through existing SCE&G VCSNS procedures and modified as necessary. The plan would cover topics such as protection of sensitive resources, stormwater management, erosion and sediment control, noise and vibration, air quality (fugitive dust), spill prevention and response, and cleanup and restoration. In addition, all construction personnel would be required to take environmental awareness training covering the aforementioned topics prior to being allowed to work onsite (SCE&G 2009a).

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No areas designated as critical habitat for endangered species exist at the VCSNS site (NRC 2004). SCE&G conducted surveys for threatened and endangered species at the VCSNS site and in transmission-line corridors associated with Unit 1 and none were found on the VCSNS site or in the transmission-line corridors (SCE&G 2002; Nelson 2006, 2007). Threatened, endangered, and other special-status species that may occur in the vicinity of the VCSNS site and in proposed associated transmission-line corridors are listed in Table 1-1 (FWS 2008a; SCDNR 2006a).

Impacts on terrestrial communities and species that could result from operation of the proposed units are generally related to either cooling-system operations or transmission-system operations. The operation of the cooling towers transfers heat to the atmosphere in the form of water vapor and can result in icing, fogging, increased humidity, increased noise levels, and the deposition of dissolved solids (i.e., cooling-tower drift). Permanent structures introduce a risk of avian collision mortality. The potential impacts of operating proposed VCSNS Units 2 and 3 on vegetation, birds, and terrestrial, wetland, and shoreline habitats are likely to be minimal.

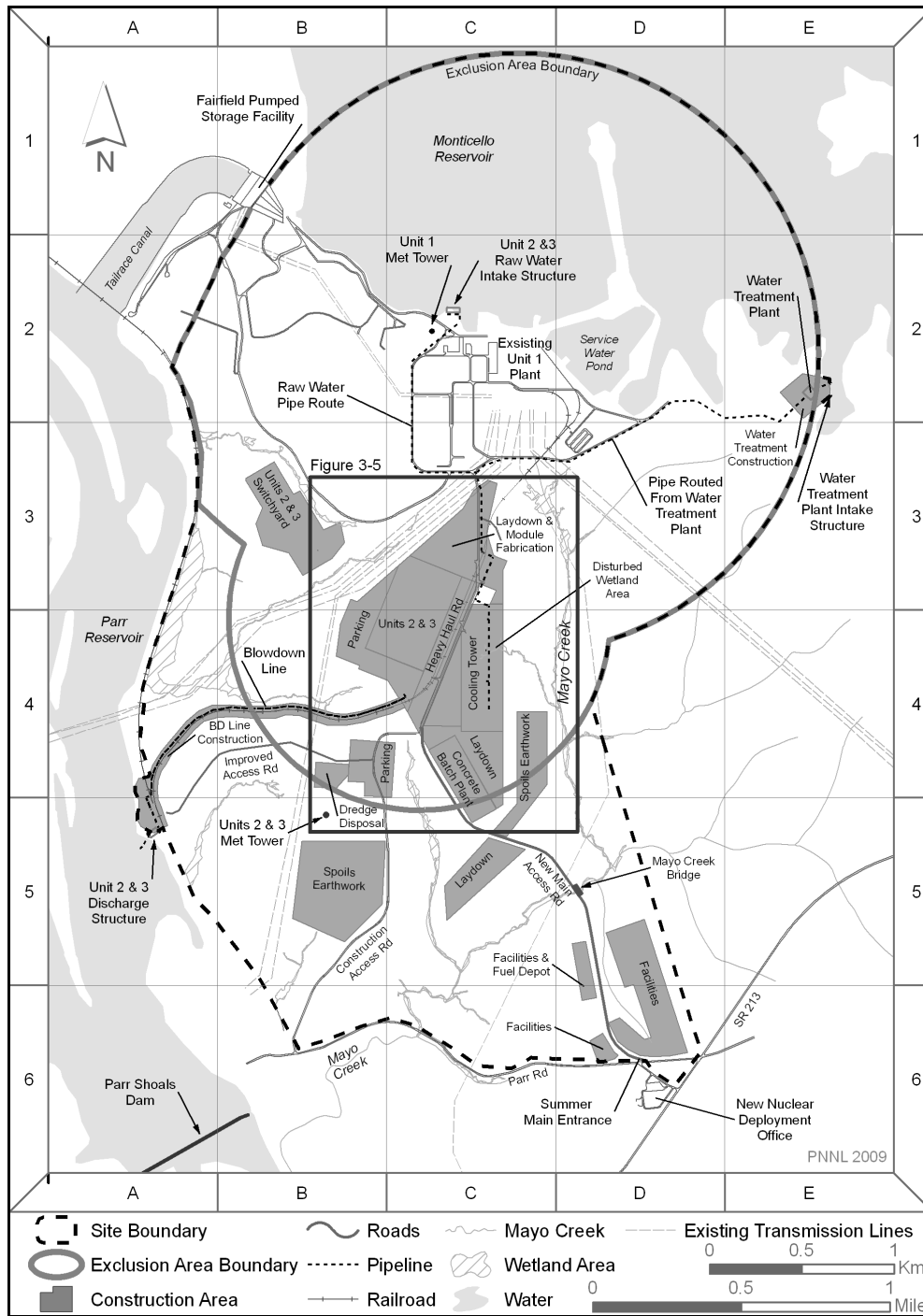
### **3.1.2 Aquatic**

Potential impacts on aquatic resources are related to reservoir intakes, reservoir discharge, onsite streams, and stormwater management.

#### **3.1.2.1 Monticello Reservoir Intakes**

The installation of two water-intake structures on the Monticello Reservoir may affect aquatic biota from dredging activities that may temporarily increase turbidity, siltation, and noise in the vicinity of the construction areas. SCE&G has proposed to install a new raw-water intake structure approximately 1250 ft west of the existing VCSNS Unit 1 intake structure to supply makeup cooling water for Units 2 and 3. Water for plant operations (service water system, makeup and potable, fire protection, and demineralized water systems) would also be derived from Monticello Reservoir, but would be obtained from the water-treatment plant intake structure to be installed approximately 5500 ft east of the existing VCSNS Unit 1 intake structure (Figure 3-1) (SCE&G 2009a). Proposed activities associated with the installation of intake structures include the installation of a sheet-pile cofferdam and the subsequent dewatering of the construction area (SCE&G 2009a). Prior to the installation of the cofferdam, plans include the installation of a turbidity curtain around the perimeter of the installation area (SCE&G 2009a). Turbidity curtains are often used in conjunction with activities that cause increased sedimentation and turbidity and are a tool for implementing BMPs (Francingues and Palermo 2005).





**Figure 3-1.** Map Showing the Location of Two New Intake Structures in Monticello Reservoir and the Blowdown Line in Parr Reservoir

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The intake design through-screen velocity greatly influences the rate of impingement of fish and shellfish at a facility. The higher the through-screen velocity, the greater the number of biota impinged. The EPA has established a national standard for the maximum design through-screen velocity of no more than 0.5 foot per second (fps) (66 FR 65256). Impingement and entrainment impacts from operation of VCSNS Unit 1 were determined to be small during license renewal assessment (NRC 2004). Given that the impingement and entrainment rates for Unit 1 are based on a flow rate of 1190 cubic feet per second (cfs), and the circulating-water system flow rates for Units 2 and 3 would require between 81 and 131 cfs, the reduced flow rates should result in lower impingement rates compared with Unit 1 (SCE&G 2009a, Figure 5-1). Based on the planned low through-screen intake velocity (less than or equal to 0.5 fps), flow rates that are at least 9 times less than those of existing Unit 1, and the high fecundity of the species sampled in the Unit 1 impingement studies, the review team concludes that impacts from impingement of fish related to the proposed VCSNS Units 2 and 3 would be minor.

### **3.1.2.2 Parr Reservoir Discharge**

Installation activities associated with a discharge structure proposed to be located in Parr Reservoir include dredging and pile driving, which can cause noise impacts as well as increased sedimentation and runoff (Figure 3-1). The specifications pertaining to the discharge structure have not been finalized, but the proposed discharge pipe and diffuser line would extend approximately 100 ft from the shoreline into the reservoir and would be stabilized with rip-rap. The diffuser line would contain multiple ports with the discharge points approximately 3 ft above the bottom of the reservoir (SCE&G 2009a). Activities associated with the installation of the blowdown line and discharge structure include pile driving and excavation of the land extending from the uplands to the water's edge to facilitate an adequate slope of the blowdown line (SCE&G 2009a). Preparation and installation of the discharge structure at Parr Reservoir include installation of sedimentation and turbidity control structures such as turbidity curtains and cofferdams, excavation and dredging in the vicinity of the diffuser structure, and disposal of dredged materials (SCE&G 2009a).

Blowdown and other liquid effluent would discharge to Parr Reservoir at a normal discharge flow rate of 21 cfs (assuming four cycles of concentration) and at maximum blowdown temperature of 91.8°F (SCE&G 2009a). Under normal operations with low flow conditions between November and April, the thermal plume would exceed the 5°F difference between ambient and plume temperature if the mixing zone occurs across 10 percent or less of the Parr Reservoir channel. If the mixing zone was extended to 25 percent, the thermal plume differential with ambient water would be less than 5°F. Under extreme 7Q10 (lowest flow for 7 consecutive days expected to occur once per decade) conditions in the summer, none of the scenarios for mixing zone width violate criteria set by SCDHEC to not exceed 90°F, or be more than 5°F above ambient water temperature for the mixing zone (SCDHEC 2008). The flow reversal by FPSF operation is not expected to exceed the results presented above as representative of

extreme flow conditions (see EIS Section 5.2.3.1 for a more detailed discussion). Under the previous extreme assumptions used to assess the extent of the 5°F above ambient isotherm, a mixing zone that would occupy one-half of the Parr Reservoir channel width would still allow motile aquatic biota to avoid the affected mixing zone area. The most abundant fish in Parr Reservoir include gizzard shad, threadfin shad, bluegill, and white perch, which are all prolific spawners (Dames and Moore 1985). Because at least three-quarters of the width of the Parr Reservoir channel would be unaffected by thermal plume impacts, it is not expected that these populations would see noticeable impacts in reductions of eggs and larvae.

Another factor related to thermal discharges that may affect aquatic biota is cold shock. Cold shock occurs when aquatic organisms that have been acclimated to warm water, such as fish in a power plant's discharge canal, are exposed to a sudden temperature decrease. This sometimes occurs when single-unit power plants shut down suddenly in winter. Cold shock mortalities at U.S. nuclear power plants have typically involved small numbers of fish and did not result in population-level effects (NRC 1996). Cold shock may also occur under extreme weather events and may adversely affect aquatic biota. For example, in January 1984 an extreme cold event resulted in the mortality of a large number of young-of-year gizzard shad within Monticello Reservoir (Dames and Moore 1985). Impacts on aquatic biota stemming from cold shock most often occur in winter months. Life-history stages that can be particularly sensitive to perturbations in water temperature include larval and juvenile stages as well as spawning and egg development. Fish within the Parr Reservoir do not typically undergo these vulnerable life stages and life-history events during the winter months.

Another discharge-related impact includes the chemical treatment of the cooling water. The environmental report (ER) indicates that chemicals would be added to the circulating-water and service-water systems that would be discharged into the blowdown lines and ultimately into Parr Reservoir. Biofouling would be controlled using metered pumps that inject chemicals into the raw-water pipeline and into the service-water pump discharge (SCE&G 2009a). Chemical treatments proposed for use during the operation of VCSNS Units 2 and 3 are outlined in EIS Table 3-5. These chemicals are the same as those used for VCSNS Unit 1 (SCE&G 2009a). The water flow from the Parr Reservoir would further dilute the concentration of these chemicals. The use of chemicals in the existing VCSNS Unit 1 is regulated by an NPDES permit, which is granted under permit number SC0030856. The chemical concentrations at the outfall for the existing units meet the NPDES limits (SCE&G 2009a). A new NPDES permit would likely be needed for the new discharge into Parr Reservoir. Sampling efforts in Monticello Reservoir since the operation of Unit 1 have not indicated any impacts associated with chemical toxicity (Christie and Stroud 1996, 1997, 1998, 1999; Normandeau 2007, 2008, 2009). Therefore, chemical discharges associated with proposed Units 2 and 3 to the Parr Reservoir would likely be minor.

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Physical impacts can occur from discharge in the form of scouring, siltation, sediment transport, increased dissolved oxygen, eutrophication, and increased turbidity. The maximum discharge velocity at the diffuser ports is anticipated to range from 6.9 to 11.3 fps, depending on the mode of operation (Toblin 2007, Section 5.3.2.2.3). The diffuser line would be located near the bottom of the reservoir; approximately 10 ft below the normal minimum water surface (SCE&G 2009a). Rip-rap placed on the bottom of the reservoir to stabilize the diffuser would also likely reduce localized scouring. The maximum extent of scouring as a result of the discharge system, is expected to encompass an area equal to 0.3 ac, or roughly one-sixth of the width of Parr Reservoir at the point of discharge (SCE&G 2009a). Within this localized area, the benthic invertebrate community would likely be altered.

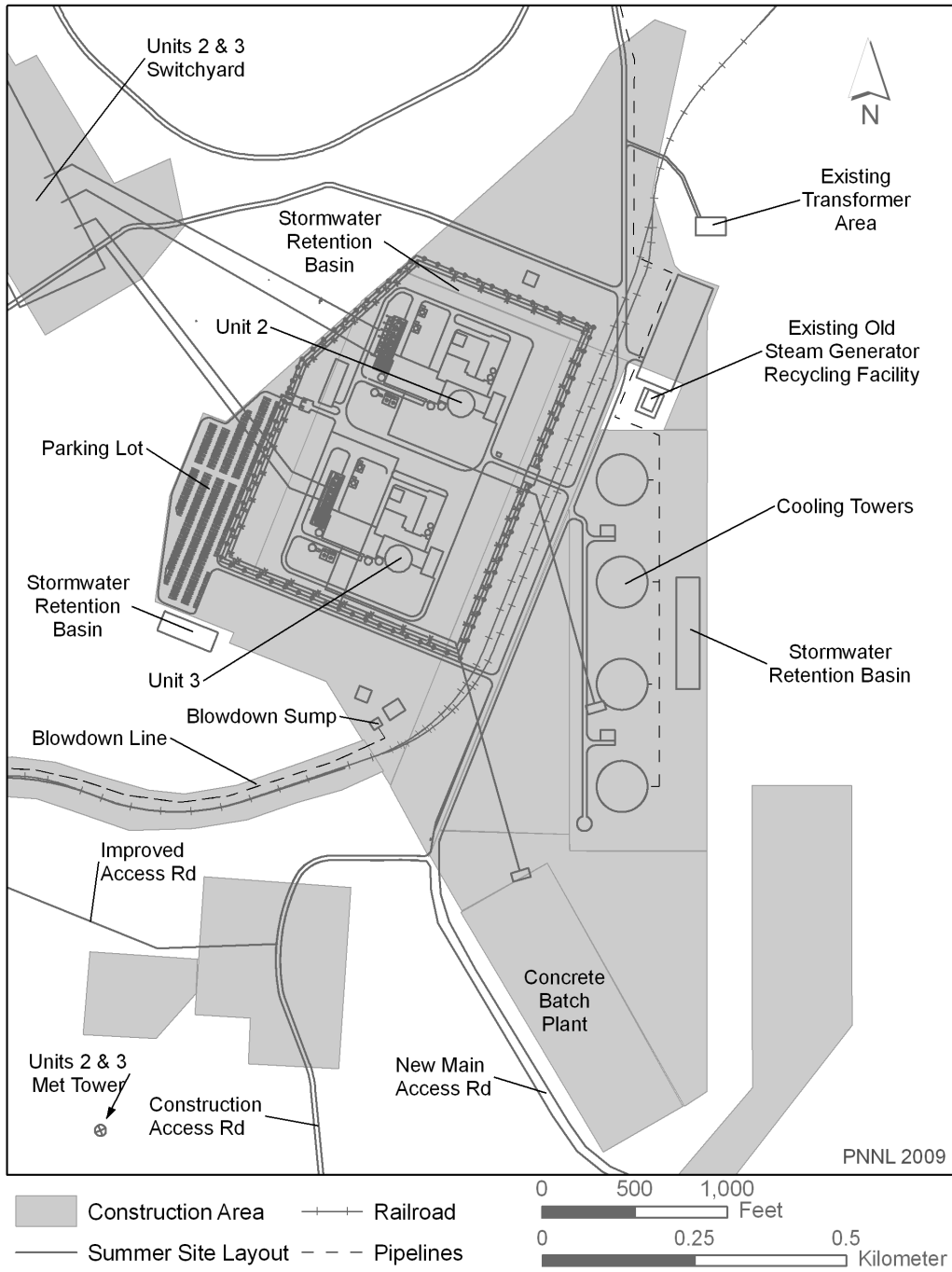
### **3.1.2.3 Onsite Streams**

Site-preparation activities associated with onsite streams include permanent and temporary impacts on aquatic environments. The designated location of cooling towers associated with proposed VCSNS Units 2 and 3 would require filling Stream L, a seasonal headwater stream that drains into Mayo Creek (SCE&G 2009a). Filling of this headwater stream would result in the permanent loss of 774 linear feet of stream habitat (SCE&G 2009a).

### **3.1.2.4 Stormwater Management**

Installing a stormwater-management system at the VCSNS would include site grading, ditches, swales, and basins. The current and proposed stormwater-retention basins in the immediate vicinity of the site are shown in Figure 3-2. Outflow from these basins would eventually drain into several unnamed creeks to the west and into Mayo Creek to the east. Once drainage enters Mayo Creek it would flow south, then west around the southern base of the powerblock area (SCE&G 2009a).

During the period of operation of the proposed VCSNS Units 2 and 3, onsite streams (Mayo Creek and intermittent streams) as well as Monticello and Parr reservoirs could be affected by stormwater drainage. SCE&G has an existing stormwater pollution prevention plan (SWPPP) to manage stormwater prior to its discharge to Monticello Reservoir. SCE&G would revise the existing VCSNS Unit 1 SWPPP to reflect the addition of new paved areas and facilities and changes in drainage patterns (SCE&G 2009a). The review team concludes that based on the use of a stormwater system comparable to the sufficient system currently used for the VCSNS Unit 1 site, the impacts on onsite streams (Mayo Creek and intermittent streams) as well as Monticello and Parr reservoirs from operation of proposed VCSNS Units 2 and 3 would be minimal.



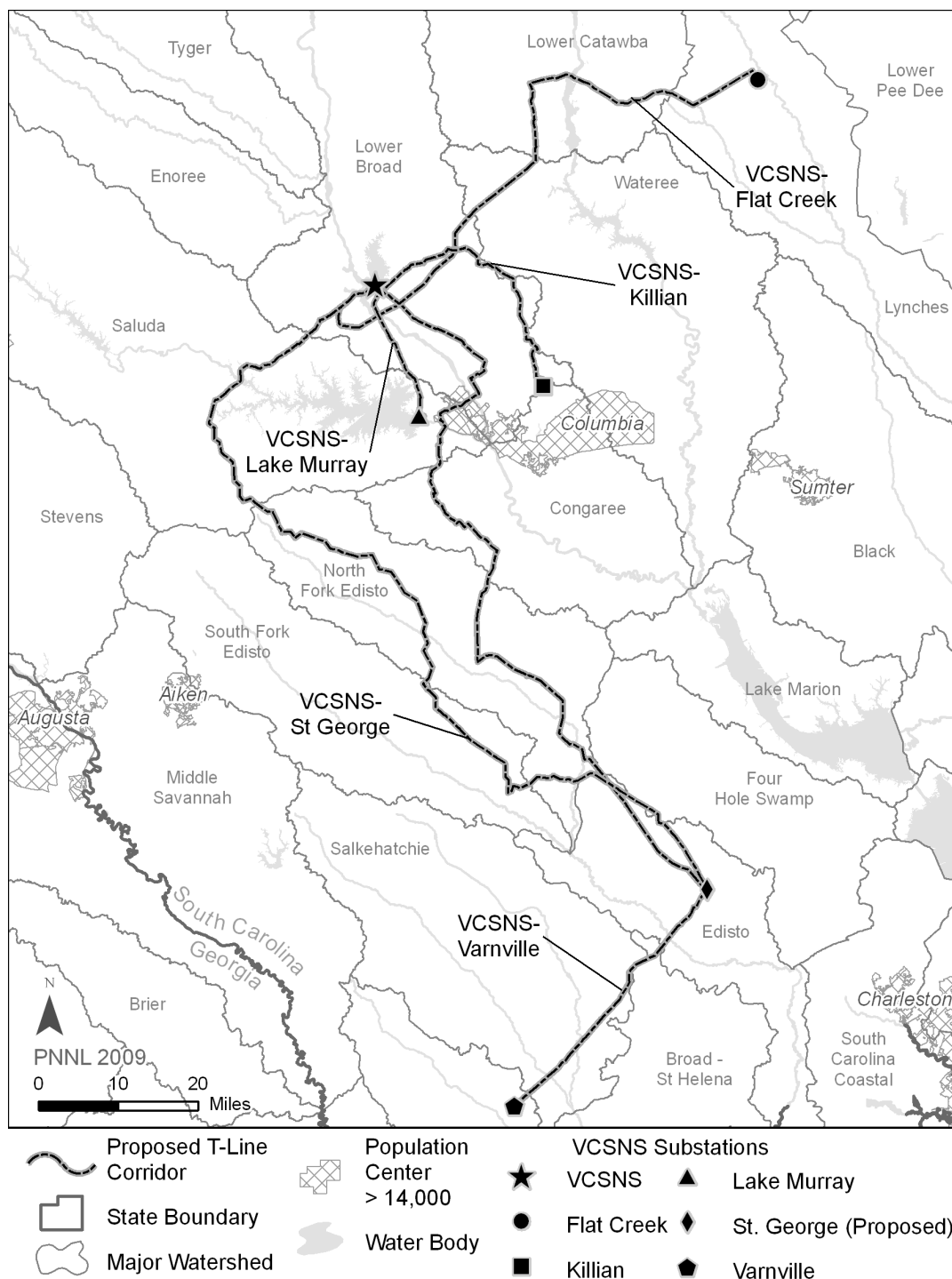
**Figure 3-2. Site Layout with Stormwater-Retention Basins**

## 3.2 Impacts from Construction and Operation in Proposed Transmission-Line Corridors

The existing transmission system for VCSNS is owned by SCE&G and Santee Cooper. Six new 230-kV transmission lines would be required in addition to the existing transmission infrastructure for transmission of electricity generated by VCSNS with the addition of Units 2 and 3 (SCE&G 2009a). Two of the six new transmission lines would be built and operated by Santee Cooper, and the remaining four new transmission lines would be built and operated by SCE&G. Two of the new SCG&E transmission lines would be built within a shared corridor, hence the six new transmission lines would occupy only five corridors (two Santee Cooper corridors and three SCE&G corridors). Activities associated with building the new transmission lines would include clearing land, installing new poles, hanging new conductors, and upgrading existing transmission lines. Figure 3-3 shows the proposed routing for the six new lines in the five transmission-line corridors. The corridors are as follows:

- VCSNS-Flat Creek – This line is owned by Santee Cooper and crosses Fairfield, Chester, and Lancaster Counties.
- VCSNS-Varnville – This line is owned by Santee Cooper and crosses Fairfield, Newberry, Richland, Lexington, Calhoun, Orangeburg, Dorchester, Colleton, and Hampton Counties.
- VCSNS-Killian – This line is owned by SCE&G and crosses Fairfield and Richland Counties
- VCSNS-Lake Murray – This line is owned by SCE&G and crosses Fairfield, Richland, and Lexington Counties.
- VCSNS-St. George – These lines are double circuit lines (two lines in a shared corridor) and are owned by SCE&G. The corridor crosses Fairfield, Newberry, Saluda, Lexington, Aiken, Calhoun, Orangeburg, and Dorchester Counties.

Most of the new transmission-line mileage would be built within existing transmission-line rights-of-way or require only the widening of existing rights-of-way. However, completely new rights-of-way would have to be cleared to build approximately 18 mi of the VCSNS-Killian transmission line and 68 mi of the VCSNS-St. George transmission lines (total of approximately 86 mi of new right-of-way). The exact locations (routes) for the new rights-of-way have not yet been finalized by SCE&G. Thus, the routes depicted in Figure 3-3 are considered provisional and subject to change (FP&S 2008). Field surveys for Federally listed threatened and endangered species have not yet been conducted in the proposed corridors because the exact routes (new, existing, or widened) have not been determined. Once siting studies are updated and final routes are determined, both SCE&G and Santee Cooper have stated that they would conduct field surveys along each of the final routes (FP&S 2008; MACTEC 2008).



**Figure 3-3.** Proposed SCE&G and Santee Cooper Transmission-Line Corridors in Relation to Crossings of Major Waterbodies

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The proposed VCSNS-Varnville and VCSNS-St. George transmission lines cross several counties and ecoregions. Both begin in the Southern Outer Piedmont and cross the Sandhills into the Coastal Plain ecoregion. Brief descriptions of the habitat types for both ecoregions are provided below.

The Sandhills ecoregion is the inland portion of the Coastal Plain that forms a discontinuous belt of varying widths of deep sands across the middle of the state (SCDNR 2005a). The sandy soils create a xeric environment that supports a distinctive type of vegetation dominated by longleaf pines and turkey oaks (*Quercus laevis*). High-frequency, low-intensity fires in the past created and supported fire-adapted longleaf pine-wiregrass communities, characterized by longleaf pine and loblolly pine with a midstory of oaks, mostly turkey oak along with blackjack oak (*Q. marilandica*), upland willow oak (*Q. incana*), and post oak (*Q. stellata*). However, fire suppression in the last several decades has allowed succession to proceed to oak-hickory forests similar to those of the Piedmont. Logging activities and fire suppression created large tracts of even-aged pine plantations and forests that do not provide high-quality wildlife habitat (SCDNR 2005a, b). Vegetation community types in the Sandhills ecoregion include grassland and early successional habitats, Sandhills pine woodland, seepage slopes, ponds and depressions, blackwater stream systems, and river bottoms. Common wildlife species found in the Sandhills ecoregion are white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). A variety of bird species also inhabit the region and include wild turkey (*Meleagris gallopavo*), northern mockingbird (*Mimus polyglottos*), and several species of warblers. There is also a high diversity of reptiles and amphibians that reside in the various habitats present in this region (SCDNR 2005a; Griffith et al. 2002).

The Coastal Plain, the largest ecoregion in South Carolina, consists of two different landscapes. The inner portion bordering the Sandhills is largely agricultural, with small patches and hardwood remnant forests along creeks. The flatwoods make up the outer portion, which is primarily pine-dominant forest. There are large floodplains that cross both portions and a majority of them are forested. The most dominant vegetation habitat types are grassland and early successional habitats, pine woodland, and river bottoms (SCDNR 2005a). The southern floodplain forests include bottomland hardwood forest consisting of bottomland oaks, red maple, sweetgum, green ash (*Fraxinus pennsylvanica*), bitternut hickory (*Carya cordiformis*), and cypress-gum swamps dominated by water tupelo (*Nyssa aquatica*), swamp tupelo (*Nyssa biflora*), bald cypress (*Taxodium distichum*), and pond cypress (*Taxodium ascendens*) (Griffith et al. 2002). Although understory vegetation in the cypress-gum swamp community is sparse, a variety of wildlife species – from amphibians to mammals – use this habitat. Common wildlife species found in this region include many game species – white-tailed deer, eastern cottontail, gray squirrel, opossum, raccoon, wild turkey, northern bobwhite quail (*Colinus virginianus*), mourning dove (*Zenaidura macroura*), red fox (*Vulpes vulpes*), gray fox (*Urocyon*



*cinereoargenteus*), wood duck (*Aix sponsa*), mink (*Mustela vison*), otter (*Lontra canadensis*), and beaver (*Castor Canadensis*) (SCE&G 2009a; SCDNR 2005a).

### 3.2.1.1 Terrestrial

#### ***Santee Cooper Transmission Lines***

The following descriptions of the proposed actions associated with the Santee Cooper transmission lines were derived from the MACTEC (2008) transmission-line siting study. The VCSNS-Flat Creek and VCSNS-Varnville lines would add approximately 235 mi of transmission line, of which approximately 99 percent would be built within existing transmission-line corridors (MACTEC 2008). The remaining 1 percent (2.44 mi) would require widening an existing transmission line right-of-way in the vicinity of the VCSNS site by 100 ft (MACTEC 2008) (Figure 3-3). Impacts on habitats and wildlife in these areas would be the same as impacts onsite and would be mitigated by the use of BMPs (MACTEC 2008). A total of 45 ac of new transmission-line right-of-way would be cleared (SCE&G 2009c; MACTEC 2008).

A wetland delineation was completed along the 2.44 mi of proposed new transmission-line corridor (approximately 45 acres of new right-of-way) in July 2008 and it was determined that site preparation would result in the conversion of approximately 552 linear feet of forested stream to nonforested stream conversion of 0.60 ac of forested wetlands to nonforested wetlands (SCE&G 2009b). Santee Cooper stated that all clearing would be done using BMPs and that no mechanized clearing or grubbing would be necessary (SCE&G 2009b).

Construction activities that would occur in the existing transmission-line corridors that may cause temporary impacts would be limited to replacement of existing structures and installation of new lines. Santee Cooper stated that it would install new structures on or adjacent to existing footprints whenever possible and that disturbance from these activities would not create impacts greater than those that occur during ongoing transmission-line corridor maintenance activities (MACTEC 2008). Santee Cooper has also stated that it would take measures to minimize impacts on wetlands by following recommendations from the USACE to mitigate temporary impacts from construction such as the use of mulches, hay bales, turbidity curtains, and other erosion-control methods. Engineering controls and existing procedures are also in place to address unavoidable disturbances. All construction activities would be performed by Santee Cooper in compliance with applicable Federal, State, and local laws, regulations, and permit requirements.

The potential impacts of transmission-line corridor maintenance and similar impacts on important habitats including floodplains and wetlands, birds, and biota because of electromagnetic fields are considered minimal, assuming that BMPs are followed and State and Federal agencies are consulted, as appropriate.

### 3.2.1.2 SCE&G Transmission Lines

The final locations for the majority of the SCE&G proposed transmission-line corridors have yet to be determined; proposed routes are shown in Figure 3-3. The following descriptions of the proposed actions associated with the SCE&G transmission lines were derived from the Facilities Planning & Siting, PLLC (FP&S 2008) transmission-line siting study.

The VCSNS-Lake Murray line would be upgraded and 100 percent routed entirely within existing transmission-line corridors. Because the entire line resides within Fairfield, Richland, and Lexington Counties (the same counties used in the site and vicinity analysis for VCSNS Units 2 and 3), the habitat types and wildlife are assumed to be similar. There would be no clearing for the Lake Murray line; only structure replacement and restringing of lines would occur (FP&S 2008). Construction activities would be performed by SCE&G in compliance with applicable Federal, State, and local laws, regulations, and permit requirements (SCE&G 2009a).

For the remaining two SCE&G lines (the VCSNS-Killian line [single-circuit] and the VCSNS-St. George line [double-circuit]), the exact routing is not yet determined, so the extent and type of wildlife within the proposed new transmission-line corridors are not known at the time of this writing. A siting study was conducted to identify optimal viable routes that would minimize impacts on important habitats and species that may occur. Both lines would require widening of existing corridors and creation of new corridors. Where the new lines are parallel to existing SCE&G transmission lines, the existing transmission-line corridor width would be increased by 70 ft. Where new lines require new right-of-way, the width of the corridor would be 100 ft (FP&S 2008). The VCSNS-Killian transmission-line siting study area encompasses 144,640 ac (226 mi<sup>2</sup>), which has an approximate linear distance of 37 mi, of which approximately 19 mi would run parallel to existing electrical transmission lines. The remaining approximately 18 mi of line would require the clearing of new corridor. The VCSNS-St. George transmission-line siting study area encompasses 874,888 ac (1367 mi<sup>2</sup>), which encompasses an approximate linear distance of 134 mi, of which approximately 66 mi would be routed parallel to existing transmission-line corridors and approximately 68 mi would require the clearing of new corridor (see EIS Table 3-1). Within the larger study areas for both lines, hypothetical transmission-line right-of-way routes were presented for the VCSNS-Killian line and the VCSNS-St. George line to use for analysis.

The proposed VCSNS-Killian line would be approximately 37 mi long with a total of approximately 380 ac of transmission-line right-of-way in Fairfield and Richland Counties. The proposed VCSNS-St. George line would be approximately 134 mi long with a total of approximately 1491 ac and the siting study area is within Aiken, Bamberg, Calhoun, Colleton, Dorchester, Fairfield, Lexington, Newberry, Orangeburg, and Saluda Counties (FP&S 2008). For the VCSNS-Killian line, the total acreage of wetland (all palustrine) to be affected by land clearing within a wetland would be approximately 18 ac, which represents approximately 4.7 percent of the 380-ac corridor (SCE&G 2009c). The total acreage of wetland (all palustrine) to

be disturbed in the VCSNS-St. George line would be approximately 201 ac within the 1491-ac corridor, which represents approximately 13.5 percent of the corridor (SCE&G 2009c).

### **3.2.1.3 Aquatic**

#### ***Santee Cooper Transmission Lines***

Santee Cooper transmission lines would cross navigable waters of the State of South Carolina at 18 locations (Figure 3-3). Permitting approval would be required by the USACE, through Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403), and SCDHEC.

The Flat Creek Line is approximately 72 mi long and is located within the Piedmont ecoregion of the state. This line crosses 55 perennial streams and 13 watersheds within the Broad, Catawba, and Pee Dee river basins. Approximately 0.7 mi of existing corridor would need to be widened, and no new corridor clearing would be required. The largest water crossings associated with the Flat Creek line occur at an unnamed impoundment near Winnsboro (1200 ft wide) and the Fishing Creek Reservoir (1300 ft wide) in Fairfield County.

The Varnville line is approximately 163 mi long and is located within the Piedmont and Coastal Plain ecoregions of the state. It crosses 85 perennial streams within 23 watersheds and falls within the Salkehatchie, Edisto, Saluda, and Broad river basins. It crosses the Saluda River at a point that is 240 ft wide and also crosses the Broad River at two discrete locations (475 ft and 500 ft wide). The installation of transmission lines across waterbodies would be done in accordance with SCDHEC consultation and permitting and, for the majority of installation activities, would be done in existing corridors. The 2.44 mi of new right-of-way proposed by Santee Cooper would require that approximately 45 ac of forest be cleared next to an existing corridor for spanning 2500 ft of the Parr Reservoir located in Fairfield and Newberry Counties (MACTEC 2008). Two transmission structures are currently in place within this span; one located on an island within Parr Reservoir and the other within the Parr Reservoir itself. However, these are in the adjacent corridor, and Santee Cooper has indicated that one or two new structures may need to be installed within Parr Reservoir (MACTEC 2008). Placement of pile foundations in the Parr Reservoir would be required for installation of new transmission towers, but no dredging activities would be required (MACTEC 2008).

#### ***SCE&G Transmission Lines***

The final locations for the majority of the SCE&G proposed transmission-line corridors have yet to be determined; proposed routes are shown in Figure 3-3. The following descriptions of the proposed actions associated with the SCE&G transmission lines were derived from the FP&S (2008) transmission-line siting study.

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The SCE&G transmission system would cross numerous streams and rivers throughout the State of South Carolina, which includes the Piedmont and Coastal Plain ecoregions (Figure 3-3). Pole structures would be spaced 500 to 800 ft apart and would be expected to span all waterbodies (FP&S 2008). The proposed VCSNS-Lake Murray line would include upgrading an existing transmission-line corridor along 19 mi with no new corridor or expansion activities (FP&S 2008).

The VCSNS-Killian line would require almost 19 mi of expansion in existing corridors, and approximately 18 mi of new corridor. An estimated 24.2 ac of corridor would be cleared within 100 ft of a stream, river, lake, or pond for the VCSNS-Killian line. Only 0.6 ac of river, lake, stream, or pond habitat is within the proposed VCSNS-Killian corridor (FP&S 2008). There are no marine waters associated with this corridor. For the 134 mi VCSNS-St. George line, 66 mi of existing corridor would be expanded and over 68 mi of new corridor would be prepared. Over 131 ac would be cleared within 100 ft of a stream, river, lake, or pond habitat, and 19.4 ac of freshwater habitat is within the proposed corridor (FP&S 2008). There are no marine waters associated with this corridor. For both the VCSNS-Killian and VCSNS-St. George corridors, SCE&G has indicated that exact positioning of corridors would avoid running in close parallel to streams so that stream buffer zones would be preserved and impacts on bodies of freshwater would be minimized (FP&S 2008).

Impacts on the waterways associated with transmission-line activities include erosion of soils, potential for pollutant discharge from equipment, and temporary disturbance and/or displacement of aquatic biota. Both SCE&G and Santee Cooper plan to implement BMPs to minimize adverse conditions for aquatic biota and habitats during transmission-line installation activities such as installation and replacement of transmission structures on the banks at river and stream crossings in such a way that runoff would be diverted, resulting in minimal impacts on adjacent streams and rivers (MACTEC 2008; FP&S 2008). SCE&G has proposed to follow State and Federal guidelines involving BMPs for limiting impacts on waterbodies (USACE 2007) during transmission system installation activities, which includes leaving low-growing vegetation intact to provide stream buffer zones (FP&S 2008). In addition, both SCE&G and Santee Cooper have acknowledged the need to acquire State and Federal permits and incorporate BMPs and SWPPPs into said permits (MACTEC 2008; FP&S 2008). SCE&G states that "SCE&G will comply with the S.C. Stormwater Management and Sediment Reduction Act related to water quality protection and will comply with the recommendations of various regulatory agencies, including the S.C. Department of Natural Resources, S.C. Department of Health and Environmental Control, the U.S. Army Corps of Engineers, etc." (FP&S 2008).

Maintenance activities along the six new 230-kV transmission lines could lead to temporary impacts on the waterways being crossed. However, it is assumed that the same vegetation-management practices currently used by SCE&G and Santee Cooper for the existing transmission-line corridors would be applied to the proposed new and upgraded transmission-

line corridors (MACTEC 2008; FP&S 2008). SCE&G and Santee Cooper practices and procedures were developed to prevent impacts on aquatic habitats so that impacts on aquatic ecosystems from operation and maintenance of transmission lines would be minimal. Santee Cooper would continue to use its Right-of-Way Management Unit Plan, which addresses vegetation clearing or maintenance for stream buffer zones (MACTEC 2008). Methods would include selective application of herbicides aimed at the removal of large woody vegetation that may ultimately interfere with the operation of transmission lines. Only EPA-approved herbicides registered for use in wetlands or aquatic sites would be used and their application would be limited to selective low-volume treatments aimed at controlling undesirable woody vegetation while still promoting low-growing, native vegetation (MACTEC 2008). Maintenance of low-growing vegetation along shorelines would be maintained as buffer zones (MACTEC 2008). Both SCE&G and Santee Cooper restrict the use of heavy equipment around wetlands and stream crossings to prevent erosion and sedimentation (SCE&G 2009a).

## 4.0 Protected Species Descriptions

This section lists Federally listed terrestrial and freshwater species that may occur in or near the VCSNS proposed transmission-line corridors (Table 1-1) and describes their life history and habitat use.

**Piping plover (*Charadrius melodus*).** The piping plover is a small shorebird that is listed as threatened and known to occur in Colleton County, one of the counties crossed by the proposed VCSNS-Varnville Line (FWS 2008a). Populations of this species are found in three regions in the United States: the Atlantic Coast, the Northern Great Plains, and the Great Lakes (FWS 2001). Critical habitat in South Carolina has been identified in Horry, Georgetown, Charleston, Colleton and Beaufort Counties (FWS 2001) Piping plovers nest on sparsely vegetated coastal beaches, sandflats, and barrier islands in South Carolina. Because neither the site nor any of the transmission lines are in coastal areas, the proposed action would not affect this shorebird.

**Wood stork (*Mycteria americana*).** The wood stork is listed as endangered and is known to occur in several counties crossed by the proposed transmission-line corridors, including Aiken, Colleton, Hampton, and Richland Counties (FWS 2008a). This species is not known to occur in Fairfield County, or in the immediate vicinity of the site. A variety of wetlands are used by this species for nesting, feeding, and roosting, and in South Carolina, colony sites are surrounded by extensive palustrine forested wetlands. Wood storks are known to nest in the upper branches of black gum or cypress trees that are located in standing water (swamps). Shallow, open water is required for successful foraging (FWS 1986; SCDNR 2005c).

**Red-cockaded woodpecker (*Picoides borealis*).** The red-cockaded woodpecker is endangered and is known to occur in Lexington and Richland Counties, which would be crossed by the proposed transmission-line corridors (FWS 2008a). Populations of this species are distributed across the southeastern United States and managed by distinct recovery units. Red-cockaded woodpeckers are dependent on open, mature pine forests and savannahs for prime foraging and nesting habitat. The large, old pines are needed because the birds excavate cavities in the living trees completely within the heartwood to roost and nest in. The cavity trees must be in homogeneous stands of pine with little to no midstory present. Red-cockaded woodpeckers require 75 to 200 ac of foraging habitat (large mature pines) with a well-developed herbaceous layer that includes native bunchgrasses and forbs. There is no suitable habitat for this species on the VCSNS site (NRC 2004).

**Flatwoods salamander (*Ambystoma cingulatum*).** The flatwoods salamander is threatened and is known to occur in Orangeburg County (FWS 2008a). Populations of this species are distributed throughout the lower Southeastern Coastal Plain from southern South Carolina through southern Georgia to northern Florida and southwestern Alabama (Palis 1997).

Flatwoods salamander habitat includes generally open-canopied pine savannas and flatwoods of the southeastern coastal plain with cypress swamps present for breeding (Palis 1997). Critical habitat in South Carolina has been identified by the FWS in three counties: Jasper County (approximately 346 ac), Berkeley County (approximately 622 ac within Francis Marion National Forest), and Charleston County (approximately 162 ac within Santee Coastal Reserve) (FWS 2008a).

**Carolina heelsplitter (*Lasmigona decorata*).** Historically, the Carolina heelsplitter could be found within small-to-large rivers, streams and ponds within the Savannah, Santee, Catawba, and Pee Dee river basins along shaded banks, and sometimes within the main channel of smaller streams. Preferred substrate types include sand, gravel, and cobble in oxygen-rich, free-flowing waters. This species is now reduced from its historic range to eight populations in North Carolina and South Carolina, largely due to habitat degradation from silviculture, agriculture, and development activities that introduce sedimentation and pollutants into creeks and streams (SCDNR 2006b). The Carolina heelsplitter was listed as endangered in June of 1993 (58 FR 34926). The complete life history of the Carolina heelsplitter is largely unknown. The remaining populations are currently found in shallow streams and filter feed on microscopic plants and organisms. Reproduction involves a glochidial larvae stage, but no fish host has been identified for this species. Critical habitat was established for the Carolina heelsplitter in 2002. Critical habitats in South Carolina for this species include Gills Creek (Catawba River system), Lancaster County; Flat Creek (Pee Dee River system), Lancaster County; Lynches River (Pee Dee River system), Lancaster, Chesterfield, and Kershaw Counties; Mountain and Beaverdam Creeks (Savannah River system), Edgefield County; Turkey Creek (Savannah River system), Edgefield and McCormick Counties; and Cuffytown Creek (Savannah River system), Greenwood and McCormick Counties (67 FR 44502). Although reported as present in the Saluda River system at one time, the Carolina heelsplitter has not been collected from this habitat since 1991 (FWS 1996).

**Georgia aster (*Aster georgianus*).** The Georgia aster, a candidate for listing in Chester, Fairfield and Richland Counties, is found in dry, open woodlands and disturbed areas, such as roadsides and utility rights-of-way that are regularly mowed. Populations are known to occur in Fairfield County, which includes the VCSNS site, and Chester and Richland Counties, which would be crossed by the proposed transmission-line corridors (FWS 2008a). However, previous field surveys associated with relicensing activities and surveys recently conducted in support of the VCSNS COL have shown that although some suitable habitat exists to support this species, none have been recorded to occur on the VCSNS site or in existing Unit 1 transmission-line corridors (SCE&G 2002; Nelson 2006, 2007).

**Pool sprite (*Amphianthus pusillus*).** Pool sprite, also known as little amphianthus, is listed as threatened and is known to occur in Lancaster and Saluda Counties, which would be crossed by the proposed transmission-line corridors (FWS 2008a; SCDNR 2006a). This aquatic plant

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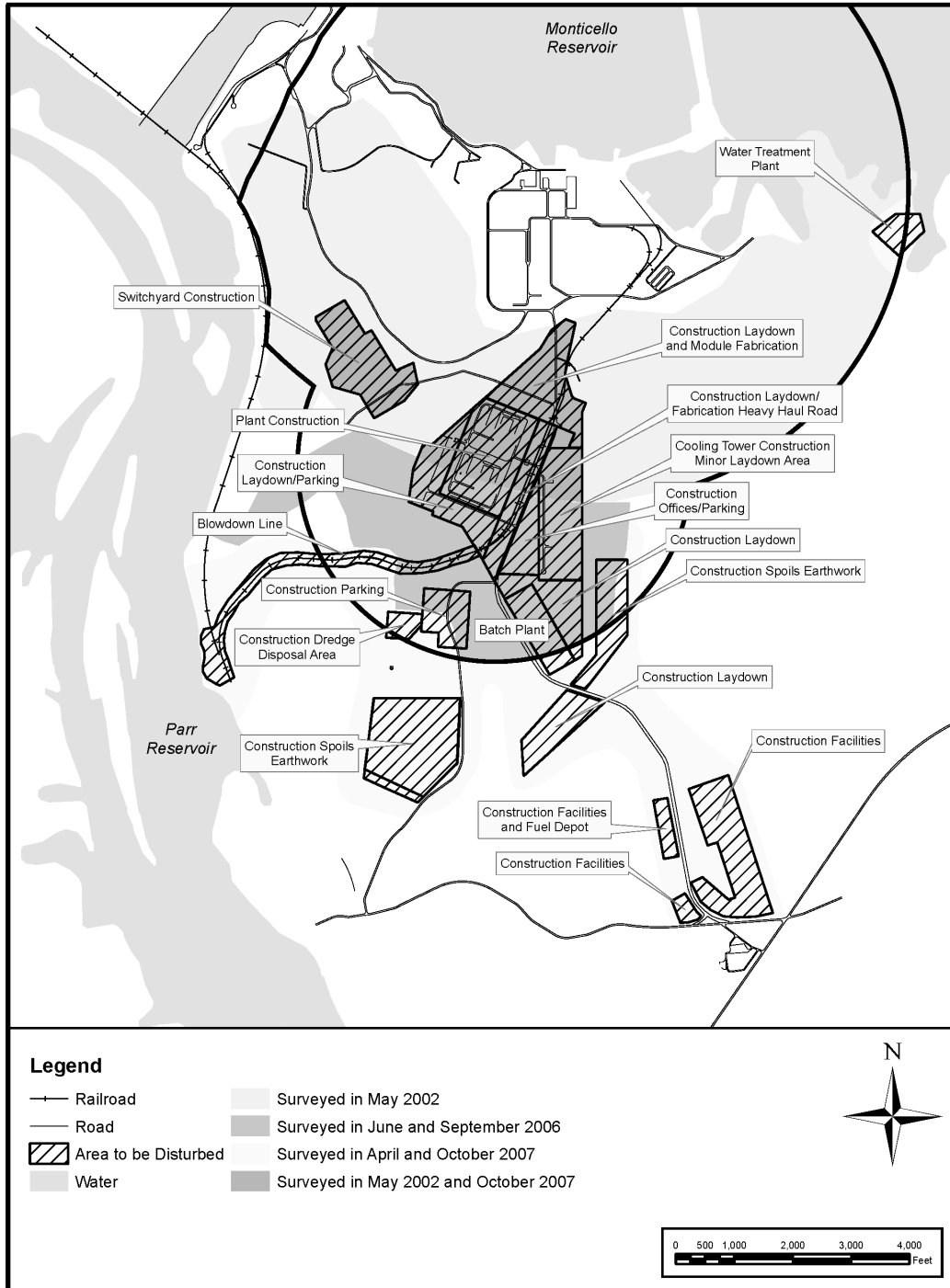
occurs in small (usually less than 1 m<sup>2</sup>) shallow pools on the crests and flattened slopes of granite outcrops and requires ideal moisture and light conditions for successful seed germination (FWS 2008b). Pool sprite is endemic to open flat granite rocks, with enough surface area to allow the development of shallow pools that fill with water during spring rainy periods when the seeds germinate, followed by rapid growth, flowering, and fruit setting (NRC 2003). The entire life span of this delicate plant is only 3 to 4 weeks (FWS 2008a).

**Smooth coneflower (*Echinacea laevigata*).** Smooth coneflower is listed as endangered and is known to occur in Richland County and may possibly occur in Lexington County (SCDNR 2006a; FWS 2008a). Both counties are crossed by the proposed transmission-line corridors. This species is found in meadows and open woodlands on basic or near neutral soils, often with eastern redcedar (*Juniperus virginiana*). Questions remain concerning the biology and natural distribution of this species in South Carolina (Nelson 2006). It is rare throughout its range and has sustained significant habitat loss, at least in part due to fire-suppression activities (Porcher and Rayner 2001). Smooth coneflower was not observed in the study area (Figure 4-1) during surveys and the likelihood of it being present on the VCSNS site is marginal due to the lack of appropriate soils present (Nelson 2007).

**Schweinitz's sunflower (*Helianthus schweinitzii*).** Schweinitz's sunflower is listed as endangered and is known to occur in Lancaster County, which would be crossed by the proposed VCSNS-Flat Creek Line corridor (FWS 2008a). It is a shade-intolerant perennial herb that produces solitary stems, up to 2 m tall and bears yellow flower heads in late summer and early autumn. This species requires full to partial sun and prefers Piedmont longleaf pine forest clearings and edges. Adapted to high-frequency, low-intensity fires, this species occurs mostly in transmission-line corridors and along roadsides because fire-suppression activities throughout its range have depleted suitable natural habitat (NatureServe 2009).

**Black-spored quillwort (*Isoetes melanospora*).** The black-spored quillwort is listed as endangered and is known to occur in Lancaster County at Forty-Acre Rock (FWS 2008a; NatureServe 2009). This granite outcrop species is an inconspicuous plant, generally under 8 cm tall. Like the pool sprite, another granite outcrop species, it is restricted to shallow, flat-bottomed depressions on granitic outcrops, where water collects after a rain. These depressions are less than 1 cm deep and usually contain soil at least 2 cm deep (NatureServe 2009). The depressions, sometimes called vernal pools, solution pits, or weather pits, are formed naturally by erosion over millions of years. Plants rarely occur in shallow pools formed by quarrying activities (FWS 2008a).





**Figure 4-1.** Threatened and Endangered Species Survey Locations at the VCSNS Site (SCE&G 2009a)

**Pondberry (*Lindera melissifolia*).** Pondberry is listed as endangered and is known to occur in Dorchester County (FWS 2008a). This deciduous aromatic shrub ranges from 0.5 to 2 m tall and usually grows in clumps in a variety of seasonal wetland habitats throughout the region (NatureServe 2009). Its flowering period is from late February to mid-March; its fruiting period is from August to early October. Searches for this species can be performed throughout the entire growing season, because masses of yellowish flowers are produced prior to leafing out, making the thicket-forming shrubs conspicuous, and leaves are diagnostic when combined with growth habit and/or fruit (USDA 2009). Habitat alteration and loss are the most considerable threat to this species (NatureServe 2009).

**Rough-leaved loosestrife (*Lysimachia asperulifolia*).** The rough-leaved loosestrife is listed as endangered and is known to occur in Richland County, which would be crossed by the proposed transmission-line corridors (FWS 2008a; SCDNR 2006a). This perennial herb occurs in ecotones between longleaf pine uplands and pond pine pocosins in moist, sandy, or peaty soils with low vegetation. Rough-leaved loosestrife has also been found to occur in disturbed areas such as roadside depressions, powerline rights-of-way, firebreaks, and trails (NatureServe 2009). There are no recorded occurrences of this species at or near the VCSNS site (NRC 2004) and none were encountered during surveys conducted in 2006 and 2007 (Nelson 2006, 2007).

**Canby's dropwort (*Oxypolis canbyi*).** Canby's dropwort is listed as endangered and is known to occur in Richland County, which would be crossed by the proposed transmission-line corridors (FWS 2008a). This perennial herb grows in wet meadows, wet pine savannahs, shallow pineland ponds, and cypress-pine swamps (NRC 2004). There are no recorded occurrences of this species at or adjacent to the VCSNS site or along the existing Unit 1 transmission lines (NRC 2004; Nelson 2006, 2007).

**Harperella (*Ptilimnium nodosum*).** Harperella is listed as endangered and is known to occur in Aiken and Saluda Counties, which would be crossed by the proposed transmission-line corridors (FWS 2008a). This annual herb can grow up to 120 cm tall and produces broad clusters of small white flowers in July and August (NatureServe 2009). Typical habitat for this annual herb is saturated rocky or gravel shoals, margins of swift-flowing streams, and edges (bays) of intermittent pineland ponds (NatureServe 2009). The most recent observation of this population in the SCDNR database was from 1985 (NRC 2003). There are no recorded occurrences of this species on the VCSNS site (SCE&G 2009a; Nelson 2007). Threats to this species include development, logging, draining and/or filling of wetlands, alterations of wetland hydrology, sedimentation, and non-native species invasion (NatureServe 2009).

**Relict trillium (*Trillium reliquum*).** The relict trillium is listed as endangered and is known to occur in Aiken County, a portion of which would be crossed by the proposed VCSNS-St. George transmission-line corridor (FWS 2008a). This perennial herb has three leaves and produces a three-petaled flower at the apex of the stem in early spring (NatureServe 2009). Relict trillium is

a species of mesic hardwood forests and can be found on various slopes, aspects, and inclines as well as on bottomlands and floodplains (NatureServe 2009). This shallow-rooting species is found on soils ranging from rocky clays to alluvial sands containing high organic content in the soil rhizosphere (NatureServe 2009). There have been no recorded occurrences of this species on the VCSNS site (NRC 2003; Nelson 2006, 2007).

## 5.0 Potential Environmental Effects of the Proposed Actions

This section describes the potential impacts from construction and operation of the proposed Units 2 and 3 to species presented in Table 1-1.

### 5.1 Construction Impacts

#### 5.1.1 Site and Vicinity

Species within the site and vicinity were reviewed for possible impacts from construction are described here.

**Wood stork (*Mycteria americana*).** Although the wood stork is listed as endangered in nearby Richland and Newberry Counties, there are no recorded occurrences on or near VCSNS site (FWS 2008a; SCDNR 2006a; SCE&G 2002; NRC 2003). Therefore, the review team has determined that construction and preconstruction at the VCSNS site would have no effect on the wood stork.

**Red-cockaded woodpecker (*Picoides borealis*).** The red-cockaded woodpecker is endangered and is known to occur in nearby Lexington and Richland Counties (FWS 2008a). However, because it is not listed in Fairfield County, appropriate habitat does not exist on the VCSNS site, and it has never been recorded on or near the VCSNS site, the review team has determined that construction and preconstruction at the VCSNS site would have no effect on the red-cockaded woodpecker (SCE&G 2002; SCDNR 2005a; NRC 2003).

**Carolina heelsplitter (*Lasmigona decorata*).** The Carolina heelsplitter has not been observed or collected near the VCSNS site, or in the Parr Reservoir, Monticello Reservoir, Mayo Creek, or other onsite streams. Habitats in both Parr and Monticello reservoirs are suboptimal with a lack of shaded stable bank habitat with free-flowing water in Monticello Reservoir and lack of shaded stable bank habitat along the shores of Parr Reservoir (MACTEC 2008). Mayo Creek has reaches of habitat with gravel or cobble bottom and well-developed canopy. However, no mussels other than the Asian clam have been observed in Mayo Creek. Therefore, it is anticipated that there would be no impacts from site and vicinity construction and preconstruction at the VCSNS site on the Carolina heelsplitter.

**Georgia aster (*Aster georgianus*).** The Georgia aster is a candidate for listing in Fairfield and Richland Counties and populations are known to occur in both counties (FWS 2008a). However, previous field surveys associated with relicensing activities and targeted threatened and endangered species surveys recently conducted in support of this COL have shown that

although suitable habitat exists, there have been no recorded occurrences on the VCSNS site (SCE&G 2002; Nelson 2006, 2007). Therefore, the review team has determined that construction and preconstruction activities at the VCSNS site would have no effect on the Georgia aster.

**Smooth coneflower (*Echinacea laevigata*).** Smooth coneflower is listed as endangered and is known to occur in Richland County and may possibly occur in Lexington County (SCDNR 2006a; FWS 2008a). Smooth coneflower was not observed in the study area during targeted threatened and endangered plant surveys conducted on the VCSNS site and the likelihood of it being present is unlikely due to the lack of appropriate soils (Nelson 2007; NRC 2003). Therefore, the review team has determined that construction and preconstruction at the VCSNS site are unlikely to have an effect on the smooth coneflower.

**Rough-leaved loosestrife (*Lysimachia asperulifolia*).** The rough-leaved loosestrife is listed as endangered and is known to occur in Richland County (FWS 2008a; SCDNR 2006a). There are no recorded occurrences of this species at or near the VCSNS site (NRC 2004) and none were encountered during targeted threatened and endangered plant surveys conducted in 2002, 2006, and 2007 (SCE&G 2002; Nelson 2006, 2007). Therefore, the review team has determined that construction and preconstruction at the VCSNS site are unlikely to have an effect on the rough-leaved loosestrife.

**Canby's dropwort (*Oxypolis canbyi*).** Canby's dropwort is listed as endangered and is known to occur in nearby Richland County (FWS 2008a). There are no recorded occurrences of this species at or adjacent to the VCSNS site and none were found during targeted threatened and endangered plant surveys conducted previously (SCE&G 2002; NRC 2004; Nelson 2006, 2007). Therefore, the review team has determined that construction and preconstruction at the VCSNS site are unlikely to have an effect on Canby's dropwort.

### 5.1.2 Transmission-Line Corridors

Although the final siting and exact locations of transmission-line corridors have not been finalized, SCE&G expects that the current siting studies to be representative of the most likely corridors for expansion, clearing, and upgrades for transmission systems necessary for VCSNS Units 2 and 3 (FP&S 2008; MACTEC 2008). In the absence of on-the-ground field surveys for threatened and endangered species along the proposed routes, SCE&G and Santee Cooper overlaid the SCDNR Heritage Trust Program digital database showing documented occurrences of protected species in all proposed corridors that would be routed within or parallel to existing corridors, and both siting study areas that would require new rights-of-way (VCSNS-St. George and VCSNS-Killian lines) (FP&S 2008). Both utilities have stated that once final routes are determined, on-the-ground field surveys would be conducted for each line. SCE&G and Santee Cooper have also both stated they would implement BMPs to minimize impacts on threatened

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and endangered species and habitats during transmission-line installation activities (FP&S 2008; MACTEC 2008).

Species within the transmission-line corridors were reviewed for possible impacts and are described below.

**Piping plover (*Charadrius melodus*).** The piping plover is listed as threatened and known to occur in Colleton County (FWS 2008a). Critical habitat in South Carolina has been identified in coastal areas of Horry, Georgetown, Charleston, Colleton and Beaufort Counties (FWS 2001). Because none of the transmission lines is routed in coastal areas, the review team has determined that construction of the proposed transmission lines is unlikely to have an effect on this shorebird.

**Wood stork (*Mycteria americana*).** The wood stork is listed as endangered and is known to occur in counties crossed by the proposed transmission-line corridors and more specifically in the VCSNS-St. George line study area (FWS 2008a; SCDNR 2006a; FP&S 2008). Most of the documented occurrences are located in the southern portion of the study area in Colleton County where suitable habitat exists (FP&S 2008; SCDNR2005c). Colony sites are surrounded by extensive palustrine forested wetlands and are in the areas where new rights-of-way, habitat loss through clearing, and forest fragmentation would occur. The wood stork could potentially occur wherever suitable habitat exists along the proposed transmission-line route. Therefore, the review team has determined that construction in the proposed transmission-line corridors may affect the wood stork. However, if SCE&G and Santee Cooper conduct surveys to identify whether wood stork nesting sites and/or habitat exist along or adjacent to the proposed transmission-line corridors, use flexibility in routing to avoid such sites, implement BMPs to minimize impacts, and adhere to Federal and State laws, construction is not likely to adversely affect the woodstork.

**Red-cockaded woodpecker (*Picoides borealis*).** The red-cockaded woodpecker is endangered and is known to occur in counties crossed by the proposed transmission lines (FWS 2008a). There are several documented occurrences within the southern portion of the VCSNS-St. George siting study area (FP&S 2008). This species might occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction in the proposed transmission-line corridors may affect the red-cockaded woodpecker. However, if SCE&G and Santee Cooper conduct surveys to identify whether red-cockaded woodpecker nesting sites and/or habitat exist along or adjacent to the proposed transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect the red-cockaded woodpecker.

**Flatwoods salamander (*Ambystoma cingulatum*).** The flatwoods salamander is threatened and is known to occur in Orangeburg County, which is crossed by two of the proposed transmission lines (FWS 2008a; MACTEC 2008; FP&S 2008). Natural Heritage records only exist for Berkeley, Charleston, and Jasper Counties (NatureServe 2009). The flatwoods salamander could occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes that go through Orangeburg County. Therefore, the review team has determined that construction in the proposed transmission-line corridors may affect the flatwoods salamander. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect the flatwoods salamander.

**Carolina heelsplitter (*Lasmigona decorata*).** The installation of transmission systems associated with the Santee Cooper lines is targeted for two corridors: VCSNS-Flat Creek and VCSNS-Varnville. The VCSNS-Flat Creek line crosses Fairfield, Chester, and Lancaster Counties and contains critical habitat for the Carolina heelsplitter in Gills Creek, Flat Creek, and the Lynches River (67 FR 44502). No new corridor clearing would occur within this proposed corridor route because existing corridor would be used for new transmission-line installation. The installation activities within the corridor that pass through Chester and Lancaster Counties cross Flat Creek, but not Gills Creek or the Lynches River (MACTEC 2008). To minimize impacts on critical habitat from sedimentation and erosion, Santee Cooper would follow its Right-of-Way Management Unit Plan to limit the effects from installation activities (MACTEC 2008). The VCSNS-Varnville line crosses Fairfield, Newberry, Richland, Lexington, Calhoun, Orangeburg, Dorchester, Colleton, and Hampton Counties. No specific populations of Carolina heelsplitter are known to occur in these counties, but habitats may occur that are favorable for its survival. New corridor preparation across Parr Reservoir would be required for installation of new transmission towers in Parr Reservoir. Santee Cooper reports that "Carolina heelsplitter was included in the habitat survey of the 2.44 mi of proposed new [right-of-way]" (MACTEC 2008). Habitat was characterized as receiving no shade, and it was therefore expected that Carolina heelsplitter would not be affected by installation of transmission towers in Parr Reservoir. Following an October 2007 meeting of FWS and Santee Cooper representatives, the FWS requested a sampling plan be submitted by Santee Cooper that identifies habitat suitable for protected species within transmission-line corridors. After approval of the project, Santee Cooper intends to finalize the transmission line design as well as coordinate with FWS (MACTEC 2008).

SCE&G has proposed to install, expand, or upgrade three transmission-line corridors: VCSNS-Killian, VCSNS-Lake Murray, and VCSNS-St. George. The VCSNS-Killian corridor crosses only Fairfield and Richland Counties, while the VCSNS-Lake Murray corridor crosses Fairfield, Richland, and Lexington Counties. The VCSNS-St. George corridor crosses Fairfield,

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Newberry, Saluda, Lexington, Aiken, Calhoun, Orangeburg, and Dorchester Counties. No specific populations of Carolina heelsplitter are known to occur in these counties, but habitats may occur that are favorable for its survival. SCE&G plans to implement BMPs to minimize adverse conditions for aquatic biota and habitats during transmission-line installation activities such as installation and replacement of transmission structures at river and stream crossings on the banks in such a way that runoff would be diverted, resulting in minimal impacts on these waterbodies (FP&S 2008). If SCE&G follows State and Federal BMPs associated with water quality and habitat preservation, the review team concludes that the impacts of the preparation for and installation of new transmission-line corridors would be minimal for the Carolina heelsplitter.

**Georgia aster (*Aster georgianus*).** The Georgia aster is known to occur in Chester, Fairfield, and Richland Counties (FWS 2008a). It is of potential occurrence in suitable habitat along the yet undetermined proposed transmission-line corridor routes that cross those counties. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect the Georgia aster. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect the Georgia aster.

**Pool sprite (*Amphianthus pusillus*).** The pool sprite is known to occur within Saluda and Lancaster Counties (FWS 2008a; SCDNR 2006a), which are crossed by the proposed transmission lines associated with the VCSNS site. Only one occurrence of this plant is known from Saluda County (NRC 2003). It is of potential occurrence in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect the pool sprite. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on those species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect the pool sprite.

**Smooth coneflower (*Echinacea laevigata*).** Smooth coneflower is known to occur in Richland County and may possibly occur in Lexington County (SCDNR 2006a; FWS 2008a). It is of potential occurrence in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect the smooth coneflower. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical



habitats, implement BMPs to minimize impacts on species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect the smooth coneflower.

**Schweinitz's sunflower (*Helianthus schweinitzii*).** Schweinitz's sunflower is known to occur in Lancaster County and possibly occurs in Lexington County (FWS 2008a). It may occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect Schweinitz's sunflower. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect Schweinitz's sunflower.

**Black-spored quillwort (*Isoetes melanospora*).** Black-spored quillwort is known to occur in Lancaster County (FWS 2008a). The VCSNS-Flat Creek line crosses Lancaster County so it may occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. The proposed VCSNS-Flat Creek line would be routed almost entirely within existing transmission-line corridors, so potential impacts would be similar to those associated with right-of-way maintenance activities. Therefore, the review team has determined that transmission-line upgrade activities in the proposed transmission-line corridor would not likely affect the black-spored quillwort.

**Pondberry (*Lindera melissifolia*).** Pondberry is known to occur in Dorchester County (FWS 2008a). The proposed VCSNS-Varnville line, which is routed entirely within existing corridors, passes through the northern portion of Dorchester County (see Figure 1-1). The proposed VCSNS-St. George line, which requires approximately 68 mi of new right-of-way and the construction of a substation, terminates in northern Dorchester County. Pondberry may occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that activities in the proposed transmission-line corridors may affect pondberry. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect pondberry.

**Rough-leaved loosestrife (*Lysimachia asperulifolia*).** Rough-leaved loosestrife is known to occur in Richland County (FWS 2008a; SCDNR 2006a). It may occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect rough-leaved loosestrife. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts

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on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect rough-leaved loosestrife.

**Canby's dropwort (*Oxypolis canbyi*).** Canby's dropwort is known to occur in Richland County (FWS 2008a). It is of potential occurrence in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect Canby's dropwort. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect Canby's dropwort.

**Harperella (*Ptilimnium nodosum*).** Harperella is known to occur in Aiken and Saluda Counties (FWS 2008a). There is one recorded population of harperella approximately 0.5 mi west of the Summer-Graniteville transmission-line corridor in Saluda County (NRC 2003). The most recent observation of this population in the SCDNR database was from 1985 (NRC 2003). It is of potential occurrence in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect harperella. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect harperella.

**Relict trillium (*Trillium reliquum*).** The relict trillium is known to occur in Aiken County (FWS 2008a). It may occur in suitable habitat along the yet undetermined proposed transmission-line corridor routes. Therefore, the review team has determined that construction activities in the proposed transmission-line corridors may affect relict. However, if SCE&G and Santee Cooper conduct surveys to identify individuals on or adjacent to transmission-line corridors, use flexibility in routing to avoid threatened or endangered species and critical habitats, implement BMPs to minimize impacts on the species and habitats, and adhere to Federal and State laws, construction is not likely to adversely affect Canby's dropwort.

## 5.2 Operations Impacts

Species were reviewed within the site and vicinity and transmission-line corridors.

### 5.2.1 Site and Vicinity

The impacts of operation on species within the site and vicinity were determined, as described below.

**Wood stork (*Mycteria americana*).** Although the wood stork is listed as endangered in nearby Richland and Newberry Counties, there are no recorded occurrences of this species on or near VCSNS site (FWS 2008a; SCDNR 2006a; SCE&G 2002; NRC 2003). Therefore, the review team has determined that operation at the VCSNS site would have no effect on the wood stork.

**Red-cockaded woodpecker (*Picoides borealis*).** The red-cockaded woodpecker is endangered and is known to occur in nearby Lexington and Richland Counties (FWS 2008a). However, because it is not listed in Fairfield County, appropriate habitat does not exist on the VCSNS site, and it has never been recorded on or near the VCSNS site, the review team has determined that operation at the VCSNS site would have no effect on the red-cockaded woodpecker (SCE&G 2002; SCDNR 2005a; NRC 2003).

**Carolina heelsplitter (*Lasmigona decorata*).** The Carolina heelsplitter has not been observed or collected near the VCSNS site, or in the Parr Reservoir, Monticello Reservoir, Mayo Creek, or other onsite streams. Habitats in both Parr and Monticello reservoirs are suboptimal with a lack of shaded stable bank habitat with free-flowing water in Monticello Reservoir and a lack of shaded stable bank habitat along the shores of Parr Reservoir (MACTEC 2008). Mayo Creek has reaches of habitat with gravel or cobble bottom and well-developed canopy. However, no mussels other than the Asian clam have been observed in Mayo Creek. Therefore, the review team concludes that there would be no impacts from site and vicinity operation on the Carolina heelsplitter.

**Georgia aster (*Aster georgianus*).** The Georgia aster, a candidate for listing in Fairfield and Richland Counties and populations are known to occur in both counties (FWS 2008a). However, previous field surveys associated with relicensing activities and targeted threatened and endangered species surveys recently conducted in support of this COL have shown that although some suitable habitat exists, there have been no recorded occurrences on the VCSNS site (SCE&G 2002; Nelson 2006, 2007). Therefore, the review team has determined operation at the VCSNS site would have no effect on the Georgia aster.

**Smooth coneflower (*Echinacea laevigata*).** Smooth coneflower is listed as endangered and is known to occur in Richland County and may possibly occur in Lexington County (SCDNR 2006a; FWS 2008a). Smooth coneflower was not observed in the study area during targeted threatened and endangered plant surveys conducted on the VCSNS site and the likelihood of it being present is unlikely due to the lack of appropriate soils (Nelson 2007; NRC 2003). Therefore, the review team has determined that operation at the VCSNS site would have no effect on the smooth coneflower.

**Rough-leaved loosestrife (*Lysimachia asperulifolia*).** The rough-leaved loosestrife is listed as endangered and is known to occur in Richland County (FWS 2008a; SCDNR 2006a). There are no recorded occurrences of this species at or near the VCSNS site (NRC 2004) and none were encountered during targeted threatened and endangered plant surveys conducted in 2002,

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2006, and 2007 (SCE&G 2002; Nelson 2006, 2007). Therefore, the review team has determined that operation at the VCSNS site would have no effect on the rough-leafed loosestrife.

**Canby's dropwort (*Oxypolis canbyi*).** Canby's dropwort is listed as endangered and is known to occur in nearby Richland County (FWS 2008a). There are no recorded occurrences of this species at or adjacent to the VCSNS site or along the existing transmission lines and none were found during targeted threatened and endangered plant surveys conducted previously (SCE&G 2002; NRC 2004; Nelson 2006, 2007). Therefore, the review team has determined that operation at the VCSNS site would have no effect on Canby's dropwort.

### 5.2.2 Transmission-Line Corridors

The impacts of operation on terrestrial and aquatic species within transmission-line corridors were determined, as described below.

#### 5.2.2.1 Terrestrial

Electric power transmission systems have the potential to affect terrestrial ecological resources through corridor maintenance, bird collisions with transmission lines and structures, electrocution, and electromagnetic fields. Vegetation control in the proposed transmission-line corridors would be the primary source of potential impacts on threatened and endangered species. Both SCE&G and Santee Cooper have established maintenance procedures for power transmission systems (SCE&G 2006; Sott 2006; MACTEC 2008). Transmission-line corridors must be kept clear of woody growth through maintenance practices that prevent growth from becoming a safety hazard or potentially interrupting service. SCE&G and Santee Cooper have maintenance cycles for tree trimming that range from 1 to 7 years depending on the activity. Both utilities use chemical and mechanical control methods appropriate for the location, terrain, and vegetation or habitat present. Chemical methods include the use of nonrestricted-use herbicides (only herbicides registered by the EPA) to control any vegetation that may interfere with the transmission-line corridor. In general, both companies spray herbicides on a 3-year rotation. The consistent use of herbicides results in the growth of low-growing, nonwoody vegetation such as grasses and other native plants. Mechanical methods of vegetation control include hand clearing, pruning, mowing, and felling (SCE&G 2009a; Sott 2006; MACTEC 2008).

The impact of transmission-line corridor maintenance on wildlife and habitats, including floodplains and wetlands, was evaluated in the V.C. Summer generic EIS for license renewal (NRC 2004), and the impact was found to be of minimal significance at operating nuclear power plants with associated transmission-line corridors of variable widths (NRC 2004). SCE&G and Santee Cooper have procedures in place that minimize adverse impacts on wildlife and important habitats such as floodplains and wetlands (SCE&G 2009a). Corridor maintenance would be performed by Santee Cooper and SCE&G (in their respective corridors) in compliance

with applicable Federal, State, and local laws, regulations, and permit requirements. Therefore, the potential effects on threatened and endangered species from transmission-line maintenance in existing and new transmission-line corridors would not likely adversely affect those species listed above.

#### 5.2.2.2 Aquatic

**Carolina heelsplitter (*Lasmigona decorata*).** Maintenance activities along the six new 230-kV transmission lines in the five proposed corridors could lead to periodic temporary impacts on the waterways being crossed. However, it is assumed that the same vegetation-management practices currently used by SCE&G and Santee Cooper for the existing facility transmission-line corridors would be applied to the proposed five transmission-line corridors. SCE&G and Santee Cooper practices and procedures were developed to prevent impacts on aquatic habitats so that impacts on aquatic ecosystems from operation and maintenance of transmission lines would be minimal. Methods used by SCE&G and Santee Cooper would include not disturbing root mats in stream buffer zones; leaving low-growing vegetation intact, to the maximum extent practicable, in stream buffer zones; not changing wetland contours; not building access roads in wetlands; minimizing soil disturbance and rutting in wet areas; and using erosion-control measures and BMPs to comply with the S.C. Stormwater Management and Sediment Reduction Act (FP&S 2008) (MACTEC 2008). Only EPA-approved herbicides registered for use in wetlands or aquatic sites would be used and their application would be limited to selective low-volume treatments aimed at controlling undesirable woody vegetation while still promoting low-growing native vegetation (MACTEC 2008). Both SCE&G and Santee Cooper restrict the use of heavy equipment around wetlands and stream crossings to prevent erosion and sedimentation (SCE&G 2009a). The review team concludes that based upon the right-of-way vegetation management and maintenance plans followed by SCE&G and Santee Cooper, the impacts of transmission-line corridor maintenance activities on aquatic resources would not adversely affect the Carolina heelsplitter and its critical habitat, and additional mitigation beyond that described above would not be warranted.

## 6.0 Cumulative Effects

Future activities in the vicinity of the proposed transmission-line corridors that may affect threatened and endangered terrestrial species would include the continued expansion of the existing transmission system and other development activities, residential and commercial, in the vicinity of the proposed transmission-line corridors. This would result in further loss of habitat and increased forest fragmentation that would affect species that inhabit those areas.

Anthropogenic activities such as residential or industrial development near the vicinity of the proposed transmission-line corridors may introduce additional constraints on aquatic resources. Future activities may include shoreline development (i.e., removal of habitat), increased water needs, and increased discharge of effluents into the river basins of South Carolina. Climate change is expected to affect the Southeastern United States by decreasing rainfall, increasing water temperature, and increasing shoreline erosion (Karl et al. 2009). VCSNS transmission-line corridor construction and maintenance would not add to these potential impacts and there would be no cumulative adverse effect on protected species.

## 7.0 Conclusions

The potential impacts of building and operating the proposed Units 2 and 3 at the VCSNS site plus the associated off-site transmission lines on the species listed in Table 1-1 are listed in Table 7-1. The known distributions and records of these species, the potential ecological impacts of the construction and operation to the species, their habitat, and their prey have been considered in this biological assessment. Building and operating the subject facilities at the VCSNS site are not likely to affect any species or critical habitat listed under the Federal Endangered Species Act. Clearing forest vegetation for new or widened rights-of-way in some of the possible routes for proposed transmission lines, while a preconstruction activity that is not a part of the NRC action, could affect individuals of several species indicated in Table 7-1. This clearing, however, is not expected to adversely affect populations of these species.

**Table 7-1.** Species Potentially Affected by Construction and Operation of Proposed VCSNS Units 2 and 3

Scientific Name	Common Name	Status	Determination
<b>Birds</b>			
<i>Charadrius melodus</i>	Piping plover	T	No effect
<i>Mycteria americana</i>	Wood stork	E	May affect; not likely to adversely affect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	May affect; not likely to adversely affect
<b>Amphibians</b>			
<i>Ambystoma cingulatum</i>	Flatwoods salamander	T	May affect; not likely to adversely affect
<b>Mollusks</b>			
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	May affect, not likely to adversely affect
<b>Vascular Plants</b>			
<i>Amphianthus pusillus</i>	Pool sprite	T	May affect; not likely to adversely affect
<i>Echinacea laevigata</i>	Smooth coneflower	E	May affect; not likely to adversely affect
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	May affect; not likely to adversely affect
<i>Isoetes melanospora</i>	Black-spored quillwort	E	May affect; not likely to adversely affect
<i>Lindera melissifolia</i>	Pondberry	E	May affect; not likely to adversely affect
<i>Lysimachia asperulifolia</i>	Rough-leaved loosestrife	E	May affect; not likely to adversely affect
<i>Oxypolis canbyi</i>	Canby's dropwort	E	May affect; not likely to adversely affect
<i>Ptilimnium nodosum</i>	Harperella	E	May affect; not likely to adversely affect
<i>Trillium reliquum</i>	Relict trillium	E	May affect; not likely to adversely affect

## 8.0 References

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10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.”

40 CFR Part 122. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 122, “EPA Administered Permit Programs: the National Pollutant Discharge Elimination System.”

40 CFR Part 131. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 131, “Water Quality Standards.”

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## **Biological Assessment**

**National Marine Fisheries Service**

### **Virgil C. Summer Nuclear Station Combined License Application**

The following biological assessment was prepared as part of informal consultation with the National Marine Fisheries Service (NMFS) and published in draft NUREG-1939 in April 2010. Since then, the applicant provided refined transmission-line routing and updated information on Federally listed species in the refined routes. Subsequent consultation with NMFS is documented in the correspondence section of this appendix.



# **Biological Assessment**

**National Marine Fisheries Service**

## **Virgil C. Summer Nuclear Station Combined License Application**

**U.S. Nuclear Regulatory Commission Combined License Application**  
Docket No. 52-027 and 52-028

**U. S. Army Corps of Engineers Permit Application**  
Permit Application No. SAC 2007-1852-SIR (Virgil C. Summer Nuclear  
Station Units 3 and 4, South Carolina Electric & Gas)

Fairfield County, South Carolina

April 2010

U.S. Nuclear Regulatory Commission  
Rockville, Maryland

U.S. Army Corps of Engineers  
Charleston District

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## Abbreviations/Acronyms

ac	acre(s)
ACE	Ashepoo, Combahee, Edisto (river basin)
AP1000	Advanced Passive 1000 (pressurized water reactor)
BMP	best management practice
CFR	Code of Federal Regulations
COL	combined construction permit and operating license
DA	Department of the Army
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FPSF	Fairfield Pumped Storage Facility
ft	foot/feet
FWS	U.S. Fish and Wildlife Service
kV	kilovolt(s)
mi	mile(s)
mi <sup>2</sup>	square mile(s)
msl	mean sea level
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRC	U.S. Nuclear Regulatory Commission
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCE&G	South Carolina Electric and Gas
SCS	Santee-Cooper System
USACE	U.S. Army Corps of Engineers
USC	United States Code
VCSNS	Virgil C. Summer Nuclear Station

## 1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from South Carolina Electric & Gas (SCE&G) for combined NRC-authorized construction permits and operating licenses (COLs) to build and operate two new nuclear reactors on the site of the Virgil C. Summer Nuclear Station (VCSNS). The U.S. Army Corps of Engineers (USACE) is reviewing an application from SCE&G for a Department of the Army (DA) Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 and Section 404 of the Clean Water Act (33 USC 1251) to perform site-preparation activities and build supporting facilities for two proposed nuclear power-generation units (Units 2 and 3) with two Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive 1000 (AP1000) pressurized water reactors. The USACE is cooperating with the NRC to verify that the information presented in the National Environmental Policy Act of 1969, as amended (NEPA) document is adequate to fulfill the requirements of USACE regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the substantive environmental criteria used by the USACE in evaluating discharges of dredged or fill material into waters of the United States; and the USACE public-interest review process. The NRC and the USACE have prepared this biological assessment to support their joint consultation with the National Marine Fisheries Service (NMFS) in accordance with Section 7(c) of the Endangered Species Act of 1973, as amended (ESA). The USACE permit decision will be made following issuance of the final environmental impact statement.

Currently, there is one operating nuclear reactor, Unit 1, on the VCSNS site. Proposed Units 2 and 3 would be located approximately 4700 ft south and 1800 ft west, respectively, of the center of the existing Unit 1 containment building. The VCSNS is approximately 26 mi northwest of Columbia, South Carolina.

The USACE and the NRC are conducting a joint consultation and have prepared this biological assessment, which examines the potential impacts of building and operating the proposed VCSNS Units 2 and 3, including proposed transmission lines, on threatened or endangered species pursuant to the ESA. This biological assessment examines the effects of the proposed action on five Federally threatened or endangered aquatic species presented in Table 1-1, which are known to occur in several counties in South Carolina proposed for transmission-line corridor routing for transmission of power from VCSNS Units 2 and 3.

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**Table 1-1.** Federally Listed Aquatic Species Occurring in Aiken, Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, or Richland Counties, South Carolina

Scientific Name	Common Name	Federal Status	County of Occurrence
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered	Aiken, Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, Richland
<i>Caretta caretta</i> <sup>(a)</sup>	Loggerhead sea turtle	Threatened	Colleton
<i>Lepidochelys kempii</i> <sup>(a)</sup>	Kemp's ridley sea turtle	Endangered	Colleton
<i>Chelonia mydas</i> <sup>(a)</sup>	Green sea turtle	Threatened	Colleton
<i>Dermochelys coriacea</i> <sup>(a)</sup>	Leatherback sea turtle	Endangered	Colleton

Data Source: FWS 2008

(a) All construction and operation for VCSNS Units 2 and 3 will occur in noncoastal areas of Colleton County, thus avoiding any potential for impacts to sea turtle species. Therefore, these species are not discussed further in this biological assessment.

## 2.0 VCSNS Site Description

The VCSNS site is located in Fairfield County, South Carolina, approximately 26 mi northwest of Columbia, South Carolina (Figure 2-1). The site is in a sparsely populated, largely rural area, with forests and small farms comprising the dominant land uses. The major aquatic environments within the vicinity of proposed VCSNS Units 2 and 3 include the Broad River, Monticello and Parr reservoirs, and Mayo Creek. Mayo Creek is the largest stream within the site and vicinity and it receives drainage from several small seasonal tributary channels. The Monticello and Parr reservoirs are the largest waterbodies near the site (Figure 2-2).

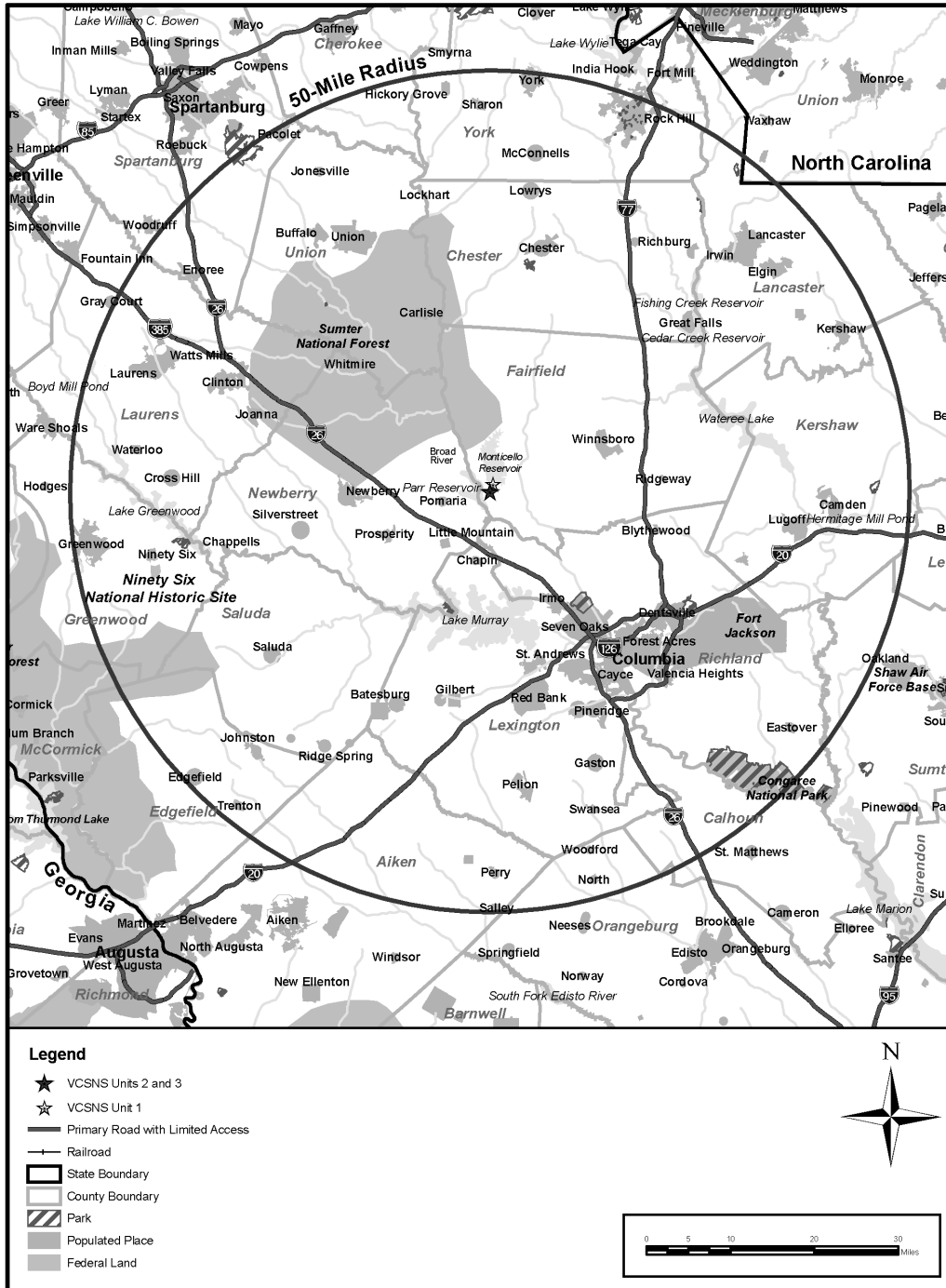
### 2.1 Broad River

The Broad River basin encompasses approximately 2400 mi<sup>2</sup> and 27 watersheds within the State of South Carolina, and includes almost 2800 mi of streams and more than 14,500 ac of lakes. The basin falls within the boundaries of seven counties in the state: Cherokee, Spartanburg, York, Union, Chester, Fairfield, and Richland (SCDHEC 2007). Within the State of South Carolina, the Broad River basin is entirely within the Piedmont ecoregion. The Piedmont is characterized by gently rolling to hilly terrain, with relatively confined stream valleys, and elevations ranging from 375 to 1000 ft above mean sea level (msl). Major tributaries of the Broad River basin include the Tyger and Enoree rivers, which intersect the Broad River from the west (SCE&G 2009). Of the 1.5 million ac associated with the basin, more than 60 percent are forested, with approximately 24 percent used for agriculture, and less than 10 percent classified as urban development (SCDHEC 2007). As shown in Figure 2-2, the Broad River flows south along the Sumter National Forest and flows to the west of the VCSNS site. A run-of-the-river impoundment along the Broad River near the vicinity of the VCSNS forms the Parr Reservoir.

### 2.2 Parr Reservoir

As described by SCE&G (2009), the Parr Reservoir was created in 1914 by installing a 2000-ft-long dam across the Broad River at Parr Shoals to provide a pool for the original Parr Hydroelectric Generating Station (also Parr Hydroelectric Plant or Parr Hydro) (Figure 2-2). Before 1977, the surface area of the reservoir was 1850 ac. In 1977, the reservoir level was raised 9 ft, which increased the surface area to approximately 4400 ac, to accommodate the operation of the Fairfield Pumped Storage Facility (FPSF) (SCE&G 2009). Parr Reservoir is approximately 7 mi long and has an average water depth of 15 ft (SCE&G 2009). Because of the operation of the FPSF, hydrologic patterns in the Parr Reservoir are variable. Generally, water from the Monticello Reservoir is released through the FPSF into Parr Reservoir throughout the day and early evening to provide hydroelectric power at Parr Shoals Dam, resulting in a net southward flow in Parr Reservoir. During the night, when electrical demand is lower, water from Parr Reservoir is pumped upward into the Monticello Reservoir, reversing the flow to the north in Parr Reservoir (SCE&G 2009).

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**Figure 2-1.** VCSNS Site Location in Relationship to the Counties and Cities Within a 50-Mi Radius of the Site (SCE&G 2009).



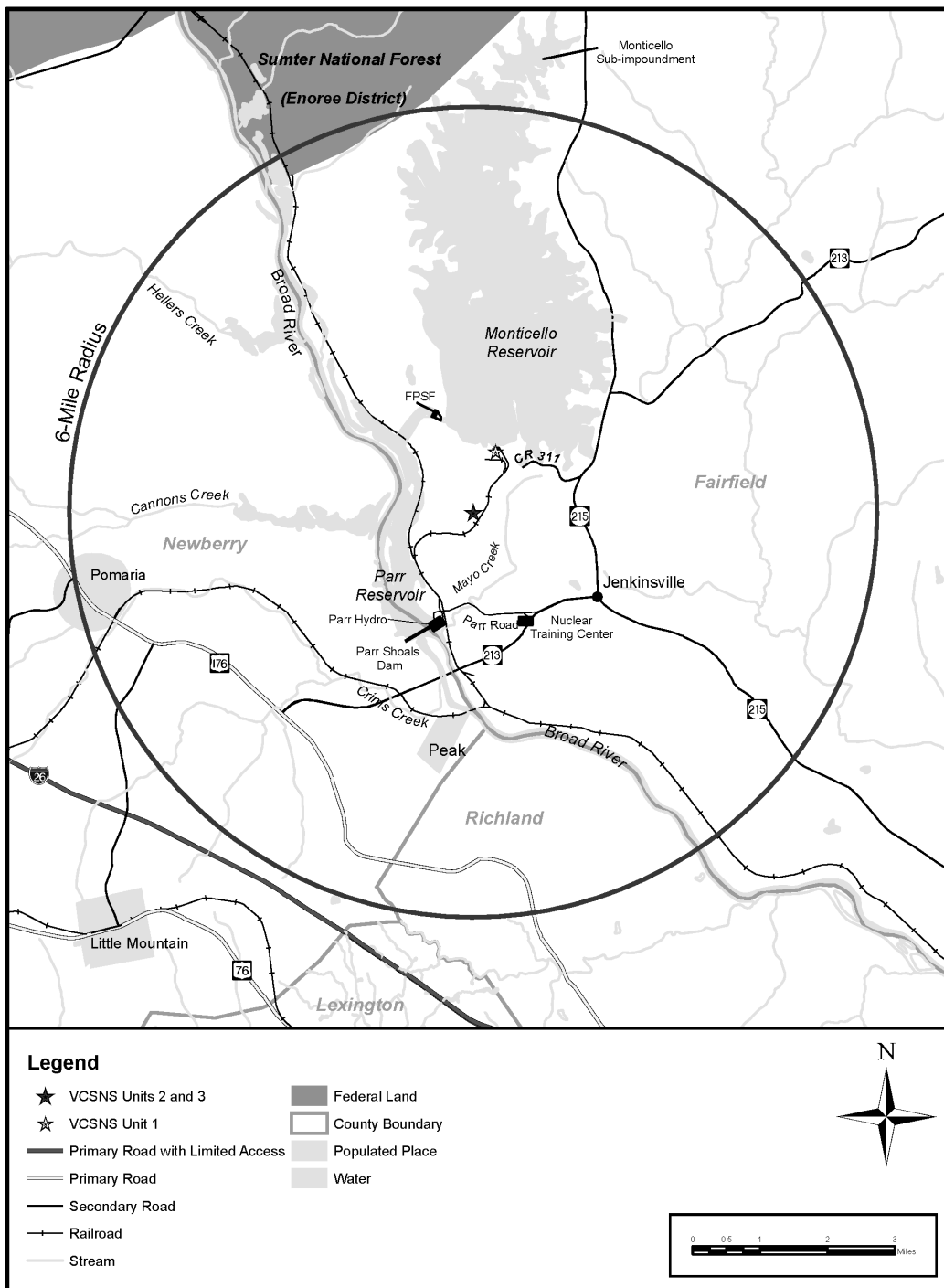


Figure 2-2. Map of the VCSNS Site and Vicinity Within a 6-Mi Radius (SCE&G 2009).

## 2.3 Monticello Reservoir

The Monticello Reservoir was formed in 1977 by damming Frees Creek, a small tributary of the Broad River that flowed into Parr Reservoir approximately 1 mi upstream from the Parr Shoals Dam (SCE&G 2009). The reservoir is hydraulically connected to the Parr Reservoir via the FPSF, and it serves both as an upper pool for the FPSF and as a cooling pond for VCSNS Unit 1 (Figure 2-2). To the northeast, the reservoir contains a subimpoundment, which is a 300-ac area owned by SCE&G and co-managed by SCE&G and the South Carolina Department of Natural Resources (SCDNR) (SCE&G 2009; SCDNR 2002). The Monticello Reservoir, excluding the subimpoundment, is approximately 6 mi long and has a total surface area of 6500 ac. The average water depth is 59 ft and the maximum depth is 126 ft (SCE&G 2009).

## 2.4 Onsite Streams

Mayo Creek is the primary perennial stream located on the VCSNS site. The creek originates 0.5 mi southeast of VCSNS Unit 1 and flows approximately 3.6 mi southwest before draining into the Broad River, downstream of the Parr Shoals Dam (Figure 2-2). The Mayo Creek drainage area is approximately 6 mi<sup>2</sup> and encompasses mixed hardwood forests that may mitigate surface-water temperatures during warm summer months (Tetra Tech NUS, Inc. 2007; SCE&G 2009). In addition to Mayo Creek, there are intermittent and seasonal stream channels within the VCSNS site vicinity. Fish have been noted in residual pools associated with intermittent tributary channels, but there may be insufficient water to maintain connectivity between habitats and perpetuate aquatic biota (Tetra Tech NUS, Inc. 2007).

## 2.5 Offsite Lakes, Streams, and Ponds

The delivery of power associated with VCSNS Units 2 and 3 would require upgrading existing transmission-line corridors and installing new corridors, transmission lines, and substations. Two entities, SCE&G and Santee Cooper (the State-owned electric and water utility, formally called South Carolina Public Service Authority), are responsible for identifying the proposed locations associated with new and upgraded transmission lines. In total, six new 230-kV lines are proposed for the transmission of electricity associated with proposed VCSNS Units 2 and 3. The six new lines cover five proposed corridors that occur in the Southern Outer Piedmont, Sandhills, and Coastal Plain ecoregions and cover a total of 97.85 ac of fresh water and no marine waters (FP&S 2008; MACTEC 2008). Systematic aquatic surveys are not included as part of the transmission-line site-selection process. In the absence of empirical data, reconnaissance-level information pertaining to species designated as endangered, threatened, or species of concern associated with the counties in which the transmission lines would occur was derived from the U.S. Fish and Wildlife Service (FWS) records (FWS 2008) and the South Carolina Heritage Trust Program (SCDNR 2006).

### 3.0 Proposed Federal Actions

The proposed Federal actions are NRC's issuance of two COLs for the construction and operation of two new nuclear reactors at the VCSNS site pursuant to Title 10 of the Code of Federal Regulations (CFR) Part 52 and the USACE's issuance of a DA permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Appropriation Act of 1899.

Prerequisites to certain NRC-authorized construction activities include, but are not limited to, documentation of existing conditions within the VCSNS site and acquisition of the necessary permits (e.g., COL, local building permits, a National Pollutant Discharge Elimination System (NPDES) permit (40 CFR Part 122), a Clean Water Act Section 404 permit, a General Stormwater Permit, and other State and local permits). After these prerequisites are completed, planned building activities could proceed and would include all or some or all the activities pursuant to 10 CFR 50.10(e)(1). Following building, the planned operation of the new reactors would be authorized if the Commission finds, under 10 CFR 52.103(g), that all acceptance criteria in the COLs are met.

The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of "construction" to those activities that fall within its regulatory authority in 10 CFR 51.4. Many of the activities required to build a nuclear power plant are not part of the NRC action to license the plant. Activities associated with building the plant that are not within the purview of the NRC action are grouped under the term "preconstruction." Preconstruction activities include clearing and grading, excavating, erection of support buildings and transmission lines, and other associated activities. These preconstruction activities may take place before the application for a COL is submitted, during the staff's review of a COL application, or after a COL is granted. Although preconstruction activities are outside the NRC's regulatory authority, many of them are within the regulatory authority of local, State, or other Federal agencies. The distinction between construction and preconstruction is not carried forward in this biological assessment; they are being discussed together as construction activities for this Section 7 consultation.

The USACE regulatory program was originally established pursuant to the Rivers and Harbors Appropriation Acts of 1890 (superseded) and 1899 (33 USC Sec. 401, et seq.). Various sections establish permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States, with the most frequently exercised USACE authority contained in Section 10 (33 USC Sec. 403). This section covers construction, excavation, or deposition of materials in, over, or under such waters, or any work that would affect the course, location, condition, or capacity of those waters. In 1972 and in 1977, amendments to the Federal Water Pollution Control Act, known as the Clean Water Act, added "Section 404" authority (33 USC 1344) authorizing the USACE to issue permits for the discharge of material into waters of the United States at specified disposal sites. Selection of such sites must be in

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accordance with guidelines developed by the Environmental Protection Agency (EPA) in conjunction with the DA. These guidelines are known as the 404(b)(1) Guidelines for the specification of disposal sites for dredged or fill material. The discharge of all other pollutants into waters of the United States is regulated under Section 402 of the Clean Water Act.

Briefly, the construction and operation activities that could affect the protected estuarine and marine species, based on habitat affinities and life-history characteristics and the nature and spatial and temporal considerations of the activity are as follows:

- Construction
  - Clearing for expansion of existing transmission-line corridors
  - Clearing for new transmission-line corridors
  - Installation of new or upgraded transmission lines and towers
- Operation
  - Vegetation control in transmission-line corridors
  - Transmission-line repairs or upgrades.

### 3.1 Transmission-Line Corridors

The existing transmission system for VCSNS is owned by SCE&G and Santee Cooper. Six new 230-kV transmission lines would be required in addition to the existing transmission infrastructure for transmission of electricity generated by VCSNS with the addition of Units 2 and 3 (SCE&G 2009). Activities associated with the SCE&G and Santee Cooper transmission systems would include clearing land, installing new poles, hanging new lines, and upgrading existing lines. Figure 3-1 shows the proposed routing for the six new lines in five transmission-line corridors. The corridors described below are as follows:

- VCSNS-Flat Creek – This line is owned by Santee Cooper and crosses Fairfield, Chester, and Lancaster Counties.
- VCSNS-Varnville – This line is owned by Santee Cooper and crosses Fairfield, Newberry, Richland, Lexington, Calhoun, Orangeburg, Dorchester, Colleton, and Hampton Counties.
- VCSNS-Killian – This line is owned by SCE&G and crosses Fairfield and Richland Counties
- VCSNS-Lake Murray – This line is owned by SCE&G and crosses Fairfield, Richland, and Lexington Counties.
- VCSNS-St. George – This line would be a double-circuit line (two lines); owned by SCE&G and it would cross Fairfield, Newberry, Saluda, Lexington, Aiken, Calhoun, Orangeburg, and Dorchester Counties.

### 3.1.1 Santee Cooper Transmission Lines

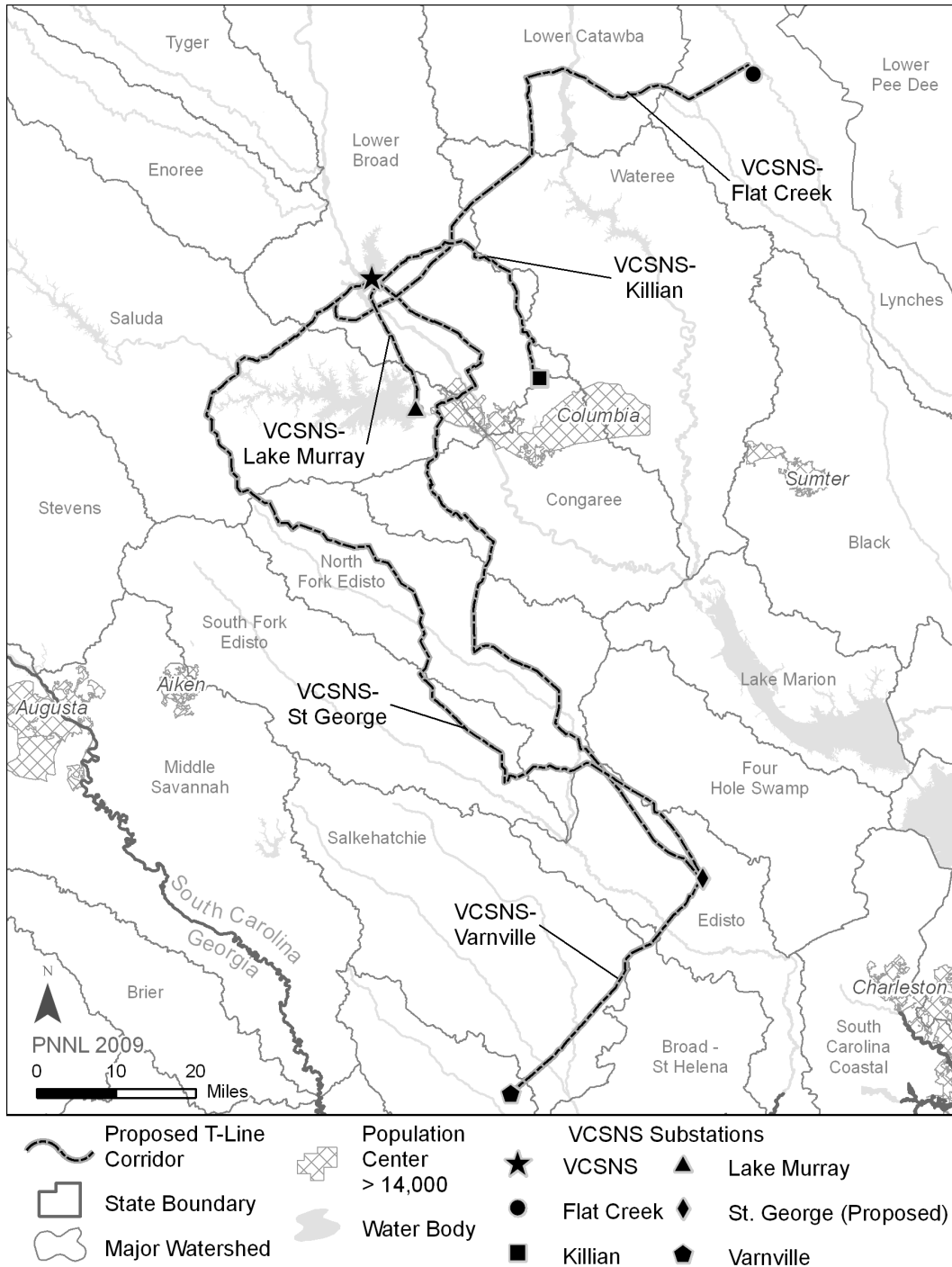
The following descriptions of the proposed actions associated with the Santee Cooper transmission lines were derived from the MACTEC (2008) transmission-line siting study. Santee Cooper proposed the addition of 232 mi of transmission lines on the VCSNS-Flat Creek and VCSNS-Varnville lines, with nearly all (98.9 percent) of the additions occurring within existing transmission-line corridors. Santee Cooper transmission lines would cross navigable waters of the State of South Carolina at 18 locations (Figure 3-1). Permitting approval would be required by the USACE through Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403) and the South Carolina Department of Health and Environmental Control (SCDHEC).

The Flat Creek Line is 72 mi long and is located within the Piedmont ecoregion of the state. This line crosses 55 perennial streams and 13 watersheds within the Broad, Catawba, and Pee Dee river basins. Approximately 0.7 mi of existing corridor would need to be widened, and no new corridor clearing would be required. The largest water crossings associated with the Flat Creek line occur at an unnamed impoundment near Winnsboro (1200 ft wide) and the Fishing Creek Reservoir (1300 ft wide) in Fairfield County.

The Varnville line is 163 mi long and is located within the Piedmont and Coastal Plain ecoregions of the state. The Varnville line crosses 85 perennial streams within 23 watersheds and falls within the Salkehatchie, Edisto, Saluda, and Broad river basins. The Varnville line crosses the Saluda River at a point that is 240 ft wide and also crosses the Broad River at two discrete locations (475 ft and 500 ft wide). The installation of transmission lines across waterbodies would be done in accordance with SCDHEC consultation and permitting, and for the majority of installation activities it would be done in existing corridors. The 2.44 mi of new right-of-way proposed by Santee Cooper would require a 100-ft-wide transmission-line corridor to be cleared next to an existing corridor for spanning 2500 ft of the Parr Reservoir located in Fairfield and Newberry Counties (MACTEC 2008). Two transmission structures are currently in place within this span; one is located on an island within Parr Reservoir, and the other is within the Parr Reservoir itself. However, these are in the adjacent corridor, and Santee Cooper has indicated that one or two new structures may need to be installed within Parr Reservoir. Placement of pile foundations in the Parr Reservoir would be required for installation of new transmission towers, but no dredging activities would be required (MACTEC 2008).

### 3.1.2 SCE&G Transmission Lines

The final locations for the majority of the proposed SCE&G transmission-line corridors have yet to be determined. The following descriptions of the proposed actions associated with the SCE&G transmission lines were derived from the FP&S (2008) transmission-line siting study. The SCE&G transmission system would cross numerous streams and rivers throughout the State of South Carolina, which includes the Piedmont and Coastal Plain ecoregions (Figure 3-1). Pole structures would be spaced 500 to 800 ft apart and would be expected to



**Figure 3-1.** Proposed SCE&G and Santee Cooper Transmission-Line Corridors in Relation to Crossings of Major Waterbodies

span all waterbodies (FP&S 2008). The proposed VCSNS-Lake Murray line would include upgrading an existing transmission-line corridor along 19 mi with no new corridor or expansion activities (FP&S 2008).

The VCSNS-Killian line would require almost 19 mi of expansion in existing corridors, and approximately 18 mi of new corridor. An estimated 24.2 ac of corridor would be cleared within 100 ft of a stream, river, lake, or pond for the VCSNS-Killian line. Only 0.6 ac of river, lake, stream, or pond habitat is within the proposed VCSNS-Killian corridor (FP&S 2008). There are no marine waters associated with this corridor. For the 134-mi VCSNS-St. George line, 66 mi of existing corridor would be expanded and over 68 mi of new corridor would be prepared. Over 131 ac would be cleared within 100 ft of a stream, river, lake, or pond habitat, and 19.4 ac of freshwater habitat is within the proposed corridor (FP&S 2008). There are no marine waters associated with this corridor. For both the VCSNS-Killian and VCSNS-St. George corridors, SCE&G has indicated that exact positioning of corridors would avoid running in close parallel to streams so that stream buffer zones would be preserved and impacts to bodies of freshwater would be minimized (FP&S 2008).

Impacts on the waterways associated with transmission-line activities would include erosion of soils, potential for pollutant discharge from equipment, and temporary disturbance and/or displacement of aquatic biota. Both SCE&G and Santee Cooper plan to implement best management practices (BMPs) to minimize adverse conditions for aquatic biota and habitats during transmission-line installation activities such as installation and replacement of transmission structures on the banks at river and stream crossings in such a way that runoff would be diverted, resulting in minimal impacts on adjacent streams and rivers (MACTEC 2008; FP&S 2008). In addition, both SCE&G and Santee Cooper have acknowledged the need to acquire State and Federal permits and incorporate BMPs and stormwater pollution prevention plans into said permits (MACTEC 2008; FP&S 2008). SCE&G states, "SCE&G will comply with the S.C. Stormwater Management and Sediment Reduction Act related to water quality protection and will comply with the recommendations of various regulatory agencies, including the S.C. Department of Natural Resources, S.C. Department of Health and Environmental Control, the U.S. Army Corps of Engineers, etc." (FP&S 2008).

Maintenance activities along the six new 230-kV transmission lines could lead to temporary impacts on the waterways being crossed (Figure 3-1). However, it is assumed that the same vegetation-management practices currently used by SCE&G and Santee Cooper for the existing transmission-line corridors would be applied to the proposed new and upgraded transmission-line corridors (MACTEC 2008; FP&S 2008). SCE&G and Santee Cooper practices and procedures were developed to prevent impacts on aquatic habitats so that impacts on aquatic ecosystems from operation and maintenance of transmission lines would be minimal. Santee Cooper would continue to use its Right-of-Way Management Unit Plan, which addresses vegetation clearing or maintenance for stream buffer zones (MACTEC 2008). Only EPA-

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approved herbicides registered for use in wetlands or aquatic sites would be used and their application would be limited to selective low-volume treatments aimed at controlling undesirable woody vegetation while still promoting low-growing native vegetation (MACTEC 2008). Low-growing vegetation along shorelines would be maintained as buffer zones (MACTEC 2008). Both SCE&G and Santee Cooper restrict the use of heavy equipment around stream crossings to prevent erosion and sedimentation (SCE&G 2009).



## 4.0 Protected Species Descriptions

This section describes the life history and habitat use for Federally listed estuarine and marine species that may occur in or near the VCSNS proposed transmission-line corridors (Table 1-1).

### 4.1 Shortnose Sturgeon (*Acipenser brevirostrum*)

The shortnose sturgeon is a member of the Order Acipenseriformes, which includes the long-lived sturgeons and paddlefishes. The species is listed as Federally endangered and ranges along the western Atlantic coast from the Saint John River, New Brunswick, to the St. Johns River, Florida (NOAA 1998). Shortnose sturgeon inhabit coastal rivers and migrate between freshwater and estuarine river habitats. The NMFS describes 19 shortnose-sturgeon population units along its range, which is divided into northern and southern regions (NOAA 1998). The southern region includes populations starting in the Carolinas from about the Cape Fear River, North Carolina, southward.

The shortnose sturgeon has experienced severe declines in abundance that are largely attributable to pollution, overfishing, and damming of rivers used for spawning habitat (NOAA 1998). The FWS listed the shortnose sturgeon as endangered in 1967 (NOAA 1998). NMFS assumed responsibility for the species in 1974, and a recovery plan was prepared in 1998 (NOAA 1998). Nineteen population units are considered by NMFS, based on linkages between major rivers or estuaries along the Atlantic coast and differences in life-history properties among populations, and were assumed to represent genetically discrete populations (Kynard 1997). Wirgin et al. (2005) found that genetic data supported the possible existence of many genetically distinct subpopulations of shortnose sturgeon in tributaries along the western Atlantic coast. A more recent study generally supported the population segments identified by NMFS. However, Santee River sturgeon differed significantly from the nearby Winyah Bay populations, but not from Cooper River shortnose sturgeon, suggesting that Cooper River shortnose sturgeon are descendants of Santee River populations and are unable to access natal spawning habitats (Wirgin et al. 2009). NMFS initiated a status review for the shortnose sturgeon in November 2007 to update the biological information on the status of the species and to consider whether shortnose sturgeon should be identified and assessed as Distinct Population Segments rather than as a single unit (72 FR 67712).

#### 4.1.1 Shortnose Sturgeon Biology

Shortnose sturgeon are primarily amphidromous freshwater fish, living primarily in their natal freshwater river system and low-salinity estuaries with occasional migrations into higher-salinity coastal waters to feed (Bemis and Kynard 1997; NOAA 1998). While there are variations in

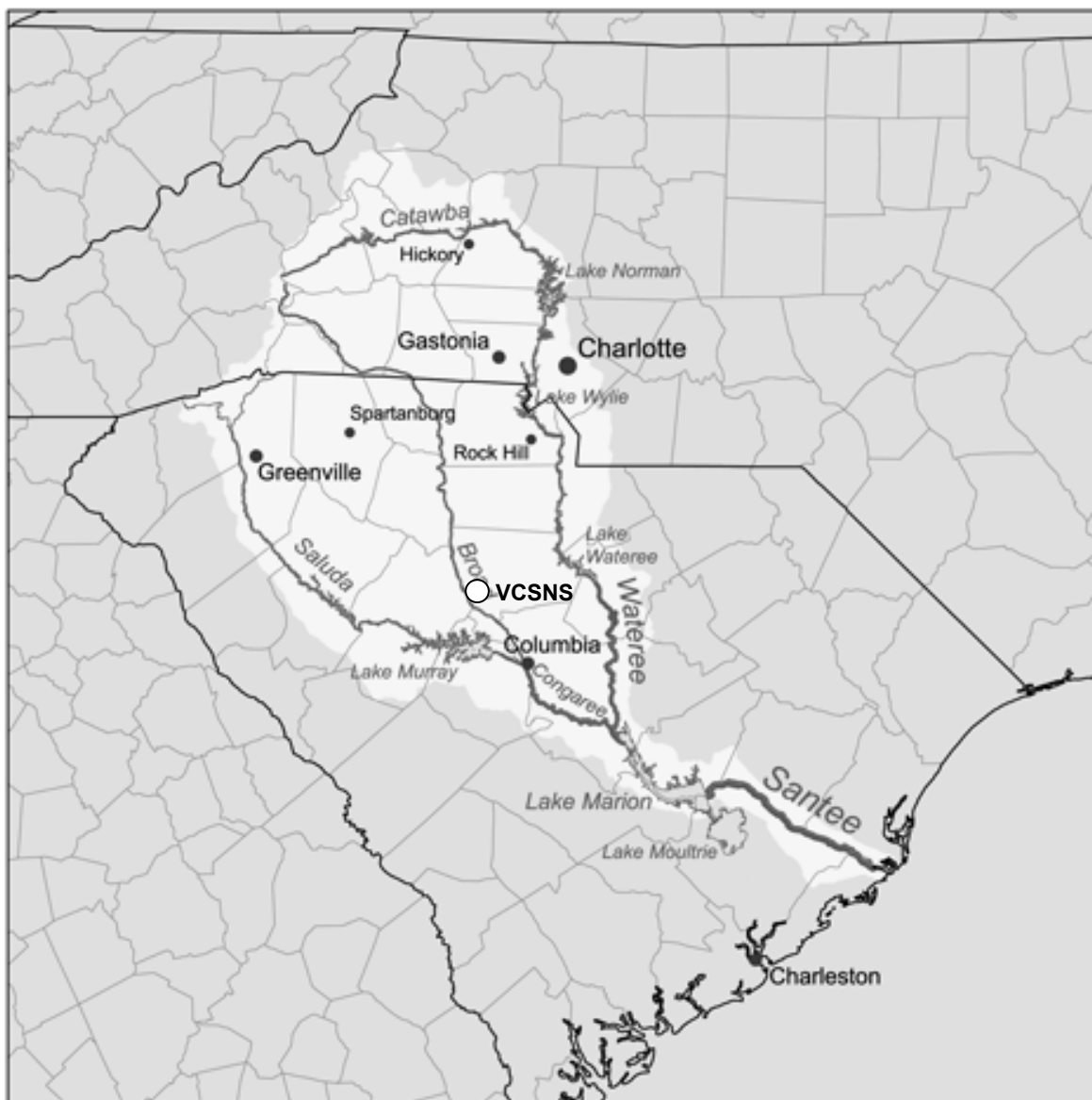
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specific life-history characteristics across its range, the following information is based on southern-region populations.

Larvae develop normal swimming attributes by 9 to 12 days post-hatch and may seek out deep waters within their natal freshwater habitats where they feed and develop into juveniles in about 3 years. Juveniles move back and forth between freshwater and estuarine habitats within natal river systems, seeking out cooler, deeper waters during summer months (Collins et al. 2002). This pattern continues into adulthood; however, Parker (2007) indicates that this species may have river-specific migration patterns developed to accommodate habitat fluctuations indigenous to that area. Shortnose sturgeon from southern regions tend to grow faster than those in more northern habitats. Adults reach about 4 ft in length. For South Carolina, males spawn between 3 and 5 years of age and females before 6 years of age (Dadswell et al. 1984). Sturgeon may spawn over a period of a few weeks in 2- or 3-year intervals, and spawning habitat is most often characterized as the most upstream reach of the natal river during the late winter/early spring (Hall et al. 1991). Preferred spawning substrate for the Congaree River shortnose sturgeon is characterized as hard bottom (Collins et al. 2003).

### **4.1.2 Shortnose Sturgeon in South Carolina Rivers**

In South Carolina, populations of shortnose sturgeon exist in the Savannah, Ashepoo, Combahee, and Edisto rivers (flowing to St. Helena Sound), the Cooper, Santee, and the Pee Dee, Waccamaw, and Black rivers (flowing to Winyah Bay). There is also a small landlocked population in the Santee-Cooper Lake System (Collins et al. 2003). With the exception of the Savannah River, the South Carolina river populations of shortnose sturgeon are less studied than populations in more northern regions. River drainages inhabited by shortnose sturgeon that lie in counties with proposed transmission-line corridors for VCSNS Units 2 and 3 include only the Ashepoo, Combahee, and Edisto rivers, and the Santee-Cooper Lake System including the Congaree River (Figure 4-1). A study by Collins et al. (2003) investigated the reproductive potential of the shortnose sturgeon population in the Congaree River within the Santee-Cooper System (SCS) because this population was effectively landlocked when a dam was constructed on the Santee River in 1941. This same study documented the migration of Lake Marion shortnose sturgeon to a spawning site on the Congaree River just south of Columbia, South Carolina. Genetic studies further confirmed the assumption that the SCS shortnose sturgeon are derived from the Santee and Cooper river populations, and have become isolated above the Lake Marion dam (Collins et al. 2003). Shortnose sturgeon have been reported in the Ashepoo and South Edisto rivers within the ACE (Ashepoo, Combahee, Edisto) river basin, but no other life-history characteristics or effective-population sizes have been documented for these populations (Collins and Smith 1997).



**Figure 4-1.** Santee River Drainage Showing Locations of VCSNS Site (white circle) in Relation to Congaree River and the Santee-Cooper System

## 5.0 Potential Environmental Effects of the Proposed Actions

This section describes the potential impacts from construction and operation of the proposed Units 2 and 3 on shortnose sturgeon in Aiken, Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, and Richland Counties in South Carolina.

### 5.1 Impacts of Construction

Although the final siting and exact locations of transmission-line corridors have not been finalized, SCE&G expects that the current siting studies are representative of the most likely corridors for expansion, clearing, and upgrades for transmission systems necessary for VCSNS Units 2 and 3 (FP&S 2008; MACTEC 2008).

The installation of transmission systems associated with the Santee Cooper lines is proposed for two corridors: VCSNS-Flat Creek and VCSNS-Varnville. The VCSNS-Flat Creek line crosses Fairfield, Chester, and Lancaster Counties and contains no waterbodies that are known habitat for shortnose sturgeon. The VCSNS-Varnville line crosses Fairfield, Newberry, Richland, Lexington, Calhoun, Orangeburg, Dorchester, Colleton, and Hampton Counties. Shortnose sturgeon are known to inhabit the Congaree River, which runs along Lexington, Richland, and Calhoun Counties. The proposed new corridor segment for this line does not occur in these counties along the Congaree River (MACTEC 2008). However, the VCSNS-Varnville line would cross other river habitats that may have shortnose sturgeon present in the proposed transmission-line corridor sited through Orangeburg, Dorchester, Colleton, and Hampton Counties. This line would cross the North Fork Edisto River at two locations: the Edisto River and the Salkehatchie River just north of where it flows into the Combahee River. However, these waterbodies would be spanned by transmission lines and in-water installation activities are not expected. By following State and Federal BMPs associated with water quality, the review team concludes that the impacts of the preparation for and installation of new transmission-line corridors would be minimal for the VCSNS-Varnville corridor.

SCE&G has proposed to install, expand, or upgrade three transmission-line corridors: VCSNS-Killian, VCSNS-Lake Murray, and VCSNS-St. George. The VCSNS-Killian corridor crosses only Fairfield and Richland Counties, and does not cross waterbodies in either county that are known habitat for shortnose sturgeon. The VCSNS-Lake Murray corridor crosses Fairfield, Richland, and Lexington Counties. This corridor runs to the north of Lake Murray in Richland and Lexington Counties, with the closest habitat for shortnose sturgeon being the Congaree River to the southeast. Because this corridor does not occur near the Congaree River, it would not impact habitat for the shortnose sturgeon. The VCSNS-St. George corridor crosses Fairfield, Newberry, Saluda, Lexington, Aiken, Calhoun, Orangeburg, and Dorchester Counties. This

corridor would cross the North Fork Edisto River along the Lexington and Aiken County line to the southwest of Woodford, South Carolina, and in Orangeburg County just southwest of the city of Orangeburg (FP&S 2008), both in the Upper Edisto River basin. Shortnose sturgeon were reported to occupy the South Fork Edisto River in 1997 (Collins and Smith 1997); however, there have been no specific reports of this species in the North Fork Edisto River. Because there are no physical barriers to migration from the ACE river basin to the North Fork Edisto River, shortnose sturgeon may inhabit this reach with the basin in two locations where the transmission-line corridor crosses. SCE&G plans to implement BMPs to minimize adverse conditions for aquatic biota and habitats during transmission-line installation activities such as installation and replacement of transmission structures on the banks at river and stream crossings in such a way that runoff would be diverted, resulting in minimal impacts on these waterbodies (FP&S 2008). By following State and Federal BMPs associated with water quality, the review team concludes that the impacts of the preparation for and installation of new transmission-line corridors would be minimal for the VCSNS-St. George corridor.

## 5.2 Impacts of Operations

Maintenance activities along the six new 230-kV transmission lines could lead to periodic temporary impacts on the waterways being crossed. Both the VCSNS-Varnville and VCSNS-St. George transmission-line corridors cross aquatic habitat that may be used by shortnose sturgeon. However, it is assumed that the same vegetation-management practices currently used by SCE&G and Santee Cooper for the existing facility transmission-line corridors would be applied to the proposed VCSNS-Varnville and VCSNS-St. George transmission-line corridors, respectively. SCE&G and Santee Cooper practices and procedures were developed to prevent impacts on aquatic habitats so that impacts on aquatic ecosystems from operation and maintenance of transmission lines would be minimal. Methods used by SCE&G and Santee Cooper would include not disturbing root mats in stream buffer zones; leaving low-growing vegetation intact, to the maximum extent practicable, in stream buffer zones; not changing wetland contours; not building access roads in wetlands; minimizing soil disturbance and rutting in wet areas; and using erosion-control measures and BMPs to comply with the S.C. Stormwater Management and Sediment Reduction Act (FP&S 2008; MACTEC 2008). Only EPA-approved herbicides registered for use in wetlands or aquatic sites would be used and their application would be limited to selective low-volume treatments aimed at controlling undesirable woody vegetation while still promoting low-growing native vegetation (MACTEC 2008). Both SCE&G and Santee Cooper restrict the use of heavy equipment around stream crossings to prevent erosion and sedimentation (SCE&G 2009). The review team concludes that based upon the right-of-way management and maintenance plans followed by SCE&G and Santee Cooper, the impacts of transmission-line corridor maintenance activities on aquatic resources would not adversely affect aquatic ecosystems, and additional mitigation beyond that described above would not be warranted.

## 6.0 Cumulative Effects on Shortnose Sturgeon

The NRC and the USACE review team considered potential cumulative effects on shortnose sturgeon that could occur because of building and operating new nuclear units at the VCSNS site proposed by SCE&G in its Combined License Application and Environmental Report. For this analysis, cumulative effects include the effects of future State, Tribal, local, and private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are not related to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the ESA (16 USC 1531, et seq.). The future is defined as the period from the start of construction of the proposed VCSNS Units 2 and 3 until the conclusion of decommissioning. The action area for this evaluation includes the ACE river basin.

Anthropogenic activities such as residential or industrial development near the vicinity of the proposed transmission-line corridors may introduce additional constraints on aquatic resources. Future activities may include shoreline development (i.e., removal of habitat), increased water needs, and increased discharge of effluents into the ACE river basin. Water quality in the ACE river basin is monitored through compliance with NPDES permits, which have been issued for 13 municipal and industrial facilities within the basin (SCDNR 2009).

Climate change is expected to affect the southeastern United States by decreasing rainfall, increasing water temperature, and increasing shoreline erosion (Karl et al. 2009). VCSNS transmission-line corridor construction and maintenance would not add to these potential impacts and there would be no cumulative adverse effect on protected species.

## 7.0 Conclusions

The potential impacts of the construction and operation of proposed VCSNS Units 2 and 3 on shortnose sturgeon in the proposed transmission-line corridors, while not entailed by the proposed NRC action, have been evaluated. The known distributions and records of the species, the potential ecological impacts of the construction and operation on the species, its habitat, and its prey have been considered in this biological assessment.

Based on this review and SCE&G's and Santee Cooper's commitment to proper siting of associated transmission lines in accordance with Federal, State, and local regulations and permit requirements; minimizing interactions with waterbodies and watercourses along the transmission-line corridors; and using appropriate State and Federal BMPs during corridor preparation, tower placement, and corridor maintenance to protect water quality, the NRC and the USACE conclude that the overall effects of the construction and operation of the proposed new units at the VCSNS site would not be likely to adversely affect or jeopardize the continued existence of the shortnose sturgeon in Aiken, Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, or Richland Counties of South Carolina.

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**SUPPLEMENTAL INFORMATION TO BIOLOGICAL  
ASSESSMENT**

**Virgil C. Summer Nuclear Station  
Combined Licenses Application**

**U.S. Nuclear Regulatory Commission Combined Licenses Application  
Docket No. 52-027 and 52-028  
U. S. Army Corps of Engineers Permit Application  
Permit Application No. SAC 2007-1852-SIR**

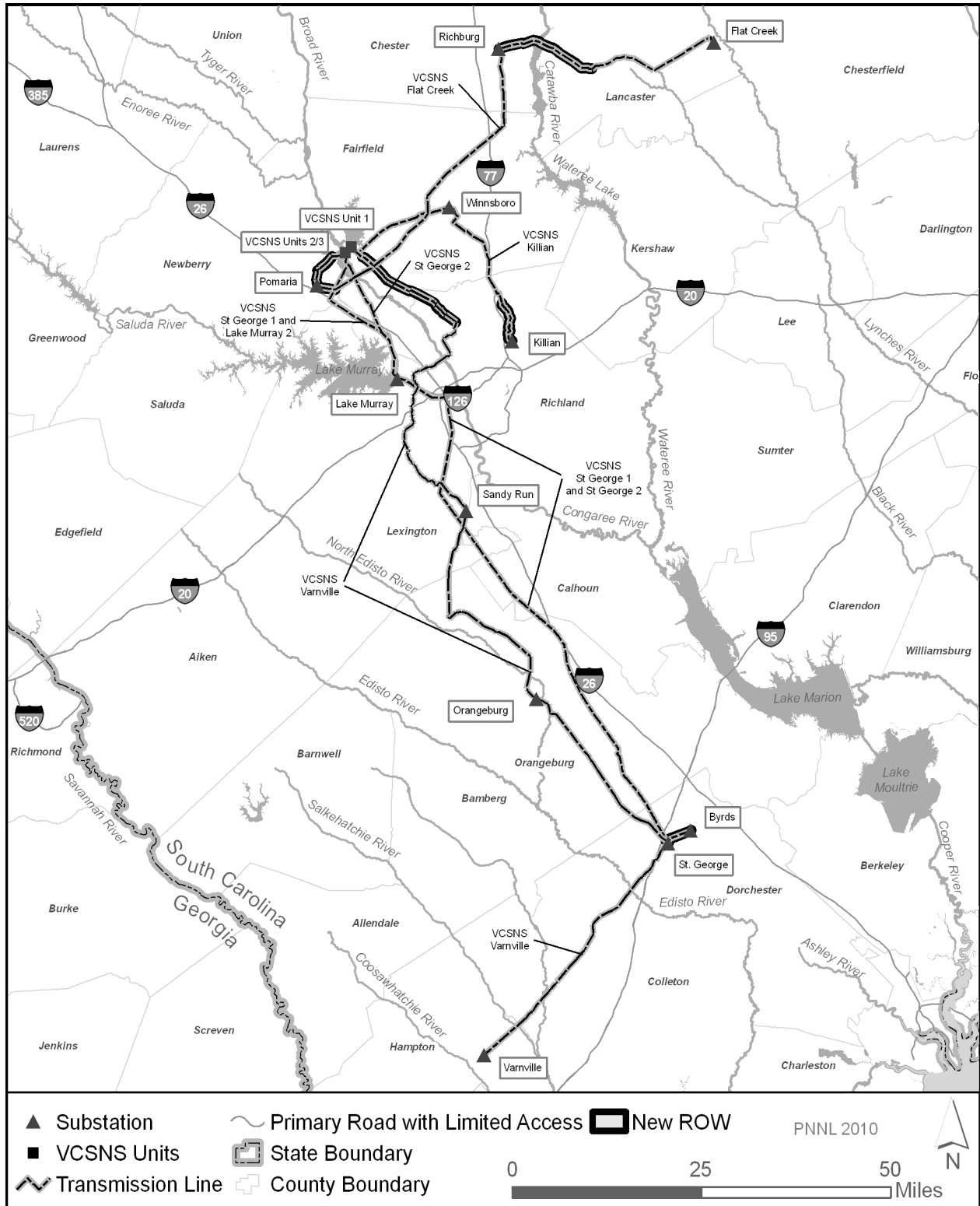
## 1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from South Carolina Electric & Gas (SCE&G) for combined NRC-authorized construction permits and operating licenses (COLs) to build and operate two Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive 1000 (AP1000) pressurized water reactors (Units 2 and 3) on the site of the Virgil C. Summer Nuclear Station (VCSNS) in Fairfield County, South Carolina. The U.S. Army Corps of Engineers (USACE) is reviewing an application from SCE&G for a Department of the Army (DA) Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344) to perform site-preparation activities to build the reactors and supporting structures. The USACE is cooperating with NRC to prepare a single environmental impact statement (EIS) under the National Environmental Policy Act of 1969, as amended (NEPA) that meets the requirements of both agencies. The NRC and USACE are referred to as the “review team” for the remainder of this document.

As part of its responsibilities under Section 7 of the Endangered Species Act, the review team prepared a biological assessment (BA) documenting potential impacts on Federally listed threatened or endangered species from the proposed new reactors. The BA was prepared as an appendix to a draft EIS issued in April 2010. FWS concurred with the findings with respect to activities conducted on the VCSNS site. However, FWS did not concur with the findings in the BA regarding the proposed new transmission lines servicing the units (FWS 2010a). Instead, the FWS asked for more precisely defined corridors for the new transmission lines and for targeted surveys for specific species within those corridors. This technical memo serves to provide FWS with the targeted survey results and other updated information provided in response to the FWS request.

The draft EIS defined only approximate routes for the proposed new transmission lines within broadly defined “macro-corridors” connecting the plant site to targeted substations. It described approximate routes for four new transmission lines to be built and operated by SCE&G and two new transmission lines to be built and operated by Santee Cooper (who would also handle power from the new facilities). Since then, SCE&G and Santee Cooper have defined precise corridors for the new transmission lines, as shown in Figure 1.

The complete list of Federally threatened and endangered species, and critical habitat having the potential to occur on or adjacent to the finalized transmission line corridors is presented in Table 1, which constitutes an update to Table 1-1 of the BA. The changes in Table 1 reflect updated database information on recorded occurrences of listed species in specific counties plus changes in the routing of the transmission lines resulting from the definition of finalized corridors. The proposed finalized transmission line routes are shown in Figure 1.



**Figure 1.** VCSNS Units 2 and 3 Expected New Transmission Line Routes (based on MACTEC 2009 and Pike 2010)

**Table 1.** Federally Listed Terrestrial and Aquatic Species and Critical Habitat in Counties Crossed by the Proposed Transmission Line Corridors

Scientific Name	Common Name	Legal Status	Counties
<b>Birds</b>			
<i>Mycteria americana</i>	Wood stork	E	Calhoun, Colleton, Dorchester, Hampton, Lexington, Newberry, Richland
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Calhoun, Chester, Colleton, Dorchester, Hampton, Lexington, Orangeburg, Richland
<b>Amphibians</b>			
<i>Ambystoma cingulatum</i>	Flatwoods salamander	T	Colleton, Orangeburg
<b>Mollusks</b>			
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	Chester, Fairfield, Lancaster, Lexington, Richland, Newberry
<b>Vascular Plants</b>			
<i>Amphianthus pusillus</i>	Pool sprite	T	Lancaster
<i>Echinacea laevigata</i>	Smooth coneflower	E	Lancaster, Lexington, Richland
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	Lancaster, Lexington
<i>Isoetes melanospora</i>	Black-spored quillwort	E	Lancaster
<i>Lindera melissifolia</i>	Pondberry	E	Colleton, Dorchester
<i>Lysimachia asperulifolia</i>	Rough-leaved loosestrife	E	Richland
<i>Oxypolis canbyi</i>	Canby's dropwort	E	Colleton, Dorchester, Hampton, Orangeburg, Richland
<i>Schwalbea americana</i>	American chaffseed	E	Colleton
<b>Critical Habitat</b> for <i>Lasmigona decorata</i>	Flat Creek	CH	Lancaster
Sources: FWS 2010b; SCDNR 2010a; 67 FR 44502			
E = Federally listed as endangered; T = Federally listed as threatened, CH= Critical Habitat			

## 2.0 Project Description

The following paragraphs discuss how the project design has been revised since the BA was completed. The revisions that follow replace the previous proposed transmission system description in Chapter 2 of the BA and the description of the proposed Federal action in Chapter 3 of the BA. Impacts from building and operation of the proposed transmission system on threatened and endangered terrestrial and aquatic species are discussed in the BA and are still applicable with the finalized routes described below.

The addition of Units 2 and 3 to the VCSNS site would require six new 230-kV lines (three for Unit 2, three for Unit 3) (SCE&G 2010a). Routes have been sited for the expected new transmission line corridors and are illustrated in Figure 1.

The planned routes of the new transmission lines are described as follows (SCE&G 2010a):

- VCSNS-Killian – This SCE&G line would be routed from the VCSNS site to the vicinity of Winnsboro and then generally follow the Interstate-77 corridor to connect to the existing Killian substation near Killian, South Carolina, running 37 mi southeast of the plant and northeast of Columbia, South Carolina. Even though 31 mi of the new line would be built entirely within existing SCE&G right-of-way, portions of the right-of-way would have to be cleared of forest vegetation in order to establish a corridor for the new line. All but the final 6 mi of this line would be routed within existing SCE&G corridors. The 6 mi would be built in new right-of-way not adjacent to any existing transmission line right-of-way (SCE&G 2010b). However, portions of the new right-of-way would be located immediately adjacent to existing roads or other utilities.
- VCSNS-Flat Creek – This Santee Cooper line would connect to the existing Winnsboro substation near Winnsboro, then to the existing Richburg switching station near Great Falls, South Carolina, and finally to the existing Flat Creek substation east of Lancaster, South Carolina, running about 72 mi in length (SCE&G 2010b). About 17 mi of new corridor running immediately adjacent to the existing corridor would be required (MACTEC 2009).
- VCSNS-St. George No. 1 and 2 – These SCE&G lines originate at the proposed VCSNS Units 2 and 3 switchyard and run generally south to a proposed new substation near St. George, South Carolina. The St. George No. 1 line would share the existing Parr Hydro-Chapin and Saluda Hydro-Newberry corridors with the new SCE&G Lake Murray No. 2 line to the Lake Murray substation near the eastern shore of Lake Murray. The St. George No. 2 line would run parallel with the existing Lake Murray No. 1 line from the VCSNS Units 2 and 3 switchyard to the Lake Murray substation. The St. George No. 1 and 2 lines would intersect near the Killian substation and run in a common corridor through existing rights-of-way to a proposed substation near St. George, South Carolina (Pike 2010). These transmission lines would be built entirely within existing transmission line rights-of-way (SCE&G 2010b).
- VCSNS-Lake Murray No. 2 – This SCE&G line would connect to the existing Lake Murray switchyard for the McMeekin and Saluda Hydro stations near the eastern boundary of Lake Murray. About 22 mi of new line would be built within the existing Parr Hydro-Chapin and Saluda Hydro-Newberry corridors and would be co-located with the proposed St. George No. 2 line (SCE&G 2010b). Even though the new line would be built entirely within existing SCE&G right-of-way, portions of the right-of-way would have to be cleared of forest vegetation to establish a corridor for the new line.
- VCSNS-Varnville – This 167-mi Santee Cooper line would connect to the existing Pomaria substation, then to Sandy Run substation near Sandy Run, then to the Orangeburg substation in Orangeburg, then to the proposed Byrds substation near St. George, and then to the existing Varnville substation near Varnville, South Carolina, in Hampton County (SCE&G 2010b). About 22 mi of new corridor running immediately adjacent to the existing corridor and about 0.5 mi of entirely new corridor would be required (MACTEC 2009).

SCE&G and Santee Cooper had defined macrocorridors for the proposed transmission lines for the BA but had not yet defined specific rights-of-way within those macrocorridors. Both have now defined specific rights-of-way for each proposed transmission line. To avoid possible

confusion, this technical memo uses the following terms in distinct contexts when discussing transmission lines:

- It uses “route” to refer to the general course of a transmission line over a landscape.
- It uses “right-of-way” to refer to a two-dimensional polygon defined by the legal boundaries of property ownership or an easement for a transmission line.
- It uses “corridor” to refer to a two-dimensional polygon defined by the limits of routine vegetation management for a transmission line.

Right-of-way refers to the entire area under the control or ownership of the utility and corridor refers to the specific and potentially smaller area that would be maintained as appropriate for the transmission lines within it. Thus, right-of-way and corridor might be the same along some sections, but when the two differ, right-of-way would be the more inclusive area with the corridor located within the right-of-way. This technical memo uses “macrocorridor” to refer to the broader polygons for transmission line development mentioned in the BA.

## 2.1 Terrestrial Impacts

Where the proposed new transmission lines would be accommodated entirely within existing corridors that are currently maintained edge to edge, habitat impacts would be limited to temporary, light disturbance of areas of grassland and scrub already subject to routine maintenance that excludes tall trees (Pike 2010; MACTEC 2009). The review team estimated impacts on forested habitat within the proposed transmission line corridors by overlaying the applicant-provided geographic information system (GIS) layer of the proposed corridors onto U.S. Geological Survey (USGS) land-use land-cover data from 2001 (SCE&G 2010b, c; USGS 2001). Much of the forest habitat requiring clearing lies within proposed new corridors, although some forest cover within existing rights-of-way that is not presently managed edge to edge would also require clearing. In those areas impacts on forests and wetlands would be minimized by implementation of best management practices (BMPs), such as the use of a silt fence and temporary and permanent vegetation stabilization techniques established by the South Carolina Forestry Commission (Pike 2010; MACTEC 2009; SCFC 1994). All work performed by SCE&G and Santee Cooper would be done in compliance with applicable Federal, State, and local laws, regulations, and permit requirements. Impacts on forests and wetlands are summarized in Table 2.

## 2.2 Aquatic Impacts

Impacts on the waterways associated with transmission line activities include erosion of soils, potential for pollutant discharge from equipment, and temporary disturbance and/or displacement of aquatic biota. Both SCE&G and Santee Cooper would implement BMPs to minimize adverse conditions for aquatic biota and habitats during transmission line installation. Examples of BMPs to minimize impacts on streams and open water include establishment of sediment basins, sediment traps, and silt fences to control and divert runoff away from streams, and maintenance of stream buffers (MACTEC 2008; FP&S 2008). In addition, both Santee Cooper and SCE&G have acknowledged the need for acquiring State and Federal permits and the incorporation of BMPs and Storm Water Pollution Prevention Plans into said permits (MACTEC 2008; FP&S 2008). SCE&G stated that it “will comply with the S.C. Stormwater



Management and Sediment Reduction Act related to water quality protection and will comply with the recommendations of various regulatory agencies, including the S.C. Department of Natural Resources, S.C. Department of Health and Environmental Control, the U.S. Army Corps of Engineers, etc.” (FP&S 2008).

**Table 2.** Summary of Forest and Wetland Impacts in Proposed Transmission Line Corridors

Transmission Line Route	Total Length (mi)	Total Area (ac) <sup>(a)</sup>	Total Forested Area (ac) <sup>(b)</sup>	Total Wetland Area (ac) <sup>(c)</sup>	Wetland Area in New Right-of-Way (ac) <sup>(c)</sup>	Forested Wetland Area to Be Cleared, New and Existing Right-of-Way (ac) <sup>(c)</sup>
VCSNS-Killian	37	365	171	31	16.6	15.5
VCSNS-Lake Murray No. 2 and VCSNS-St. George No. 1 common corridor	22	281	175	7.7	0	5.9
VCSNS-St. George No. 2 (between VCSNS site and common corridor with VCSNS-St. George 1)	18	238	158	2.9	0	0.1
VCSNS-St. George No. 1 and St. George No. 2 common corridor (Lake Murray to St. George)	76	1186	495	184	0	15.9
VCSNS-Flat Creek	72	1094	81	12.5	0.8	0.8
VCSNS-Varnville	167	2539	91	354	5.5	5.5

Source: MACTEC 2009; SCE&G 2010a; Pike 2010; USACE 2010|T-Line JD|  
(a) Source: USACE 2010.  
(b) Wetland areas from USACE (2010)

### 3.0 Updated Species Determinations

SCE&G and Santee Cooper have performed reconnaissance-level analysis in the proposed new transmission line corridors associated with proposed VCSNS Units 2 and 3 and have conducted targeted field studies of Federally-listed threatened and endangered species in areas identified to have the highest potential for those species to occur (Palmetto 2010; MACTEC 2010). SCE&G and Santee Cooper overlaid their proposed transmission line corridors onto the South Carolina Department of Natural Resources (SCDNR) and FWS occurrence maps to identify potential areas where protected species might occur. This analysis was then cross-referenced with SCDNR’s Rare Threatened and Endangered Species Inventory database to fully capture species that are known to occur in counties where the proposed transmission line corridors would occur (Palmetto 2010; MACTEC 2010). Potential habitat for each Federally listed species with the potential to occur in the project area was mapped using a

combination of infrared imagery, topographic and soils maps, and wetland features to identify survey locations (Palmetto 2010; MACTEC 2010).

SCE&G and Santee Cooper then conducted on-the-ground targeted surveys in September, October, and November 2010 in the specific areas identified as having the highest potential for threatened and endangered species to occur (Palmetto 2010; MACTEC 2010). Additional visual inspection was carried out in representative areas where at least moderate potential for species to occur was identified. The methods are fully described by Palmetto (2010) and MACTEC (2010). No threatened and endangered species were identified by SCDNR from their elemental occurrence database (SCDNR 2010b) to occur within the proposed corridors and none were found during on-the-ground field surveys (Palmetto 2010; MACTEC 2010).

**Wood stork (*Mycteria americana*) (Endangered).** As described in the BA, a variety of wetlands are used by this species for nesting, feeding, and roosting, and in South Carolina, colony sites are surrounded by extensive palustrine forested wetlands. Wood storks are known to nest in the upper branches of black gum or cypress trees that are located in standing water (swamps). Shallow, open water is required for successful foraging (FWS 1986; Murphy 2006).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that there are no known occurrences of wood stork rookeries in the proposed transmission line corridors (SCDNR 2010b). No wood storks or possible wood stork rookeries were observed in the corridors during targeted field surveys conducted by SCE&G and Santee Cooper in 2010. However, there is foraging habitat present throughout the project area, including within the proposed corridors, and it is likely wood storks could forage incidentally in those areas (Palmetto 2010; MACTEC 2010; SCDNR 2010a). Slight reductions in wood stork foraging habitat are unlikely to noticeably affect wood stork population levels in the region. Both utilities also have procedures in place to meet the guidelines set by the Avian Powerline Interaction Committee (APLIC) to ensure all powerlines associated with the proposed project are “raptor safe” in order to minimize potential impacts on raptors and other large birds (Palmetto 2010; MACTEC 2010). Based on the 2010 survey observations and the information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the wood stork.

**Red-cockaded woodpecker (*Picoides borealis*) (Endangered).** As described in the BA, red-cockaded woodpecker populations are distributed across the southeastern United States and managed as distinct recovery units. Red-cockaded woodpeckers are dependent on open, mature pine forests and savannahs for prime foraging and nesting habitat. The large, old pines are needed because the birds excavate cavities in the living trees completely within the heartwood to roost and nest in. The cavity trees must be in homogeneous stands of pine with little to no midstory present. Red-cockaded woodpeckers typically require 75 to 200 ac of foraging habitat (large mature pines) with a well-developed herbaceous layer that includes native bunchgrasses and forbs.

When reviewed in 2010, the SCDNR elemental occurrence database indicated that red-cockaded woodpeckers are known to occur in Dorchester and Orangeburg Counties (SCDNR 2010b). There is one recorded occurrence within 0.5 mi of the proposed St. George 1 – St. George 2 transmission line corridor; however, SCDNR stated that it is an extirpated population

(SCDNR 2011). There are two other recorded occurrences of the red-cockaded woodpecker approximately 1 mi away from the proposed transmission line corridors; however, none were observed during targeted field surveys conducted by SCE&G and Santee Cooper in 2010 (Palmetto 2010; MACTEC 2010; SCDNR 2010b). The field surveys for this species included inspection of each tree over 10 inches in diameter at breast height within the proposed new corridor for presence of nesting cavities. Scattered foraging habitat adjacent to the proposed transmission lines is present in corridors in counties where the species is known to occur (Palmetto 2010). There is a recorded red-cockaded woodpecker group located approximately 1 mi from an existing Santee Cooper corridor in Orangeburg County, and the closest recorded groups to the proposed new right-of-way segments are approximately 2 mi from an existing line in Orangeburg County (MACTEC 2010). SCE&G and Santee Cooper identified 15 locations having potential habitat for the red-cockaded woodpecker. They surveyed each of those locations on the ground in September, October, and November of 2010 and concluded that only one location contained suitable foraging habitat for the red-cockaded woodpecker (MACTEC 2010). That location is situated on the proposed new right-of-way for the Santee Cooper VCSNS-Flat Creek line. No red-cockaded woodpeckers were observed during ground surveys and no visible nesting activity was observed (Palmetto 2010; MACTEC 2010). It is expected that red-cockaded woodpeckers could transiently visit areas in or near portions of the transmission line corridors where suitable foraging habitat exists. Because the 2010 survey observations determined no nesting habitat was present in the proposed corridors, but suitable foraging habitat is present along the proposed routes in counties where the red-cockaded woodpecker is known to occur, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the red-cockaded woodpecker.

**Flatwoods salamander (*Ambystoma cingulatum*) (Threatened).** As described in the BA, flatwoods salamander populations are distributed throughout the lower Southeastern Coastal Plain from southern South Carolina through southern Georgia to northern Florida and southwestern Alabama (Palis 1997). Flatwoods salamander habitat includes generally open-canopied pine savannas and flatwoods of the southeastern coastal plain with cypress swamps present for breeding (Palis 1997).

When reviewed in 2010, the SCDNR elemental occurrence database did not identify any recorded occurrences of flatwoods salamander within 1 mi of any of the proposed transmission line corridors (SCDNR 2010b). Critical habitat for flatwoods salamander in South Carolina has been identified by the FWS in three counties: Jasper, Berkeley, and Charleston Counties, none of which are counties in the project area, nor are they near any of the proposed corridors, (FWS 2008).

Santee Cooper did not conduct ground surveys for the flatwoods salamander because proposed new transmission line corridors do not cross counties where it is likely to occur (MACTEC 2010). However, SCE&G identified four locations within the proposed transmission line corridors having potential habitat for the flatwoods salamander. After visiting those locations during targeted field surveys in September and October of 2010, SCE&G determined that they did not contain suitable habitat (Palmetto 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the flatwoods salamander.

**Carolina heelsplitter (*Lasmigona decorata*) (Endangered and Critical Habitat).** The Carolina heelsplitter is the sole freshwater mussel within South Carolina that maintains a designation as a Federally listed endangered species, and it is designated as a State species of highest conservation priority. The six known populations of the Carolina heelsplitter within the state are defined by geographic location: (1) Savannah River tributaries in Edgefield and McCormick Counties; (2) Cuffeytown Creek in Greenwood and McCormick Counties; (3) Lynches River and Flat Creek in Chesterfield, Kershaw, and Lancaster Counties; (4) Gills Creek in Lancaster County; (5) Fishing Creek in Chester County; and (6) Bull Run Creek in Chester County (SCDNR 2006; 67 FR 44502).

Historic distribution of this species in South Carolina included the Pee Dee and Savannah drainages and possibly the Saluda drainage. Historic associations included freshwater habitats ranging from small-to-large streams and rivers. The Carolina heelsplitter has been noted to occur in association with substrate ranging from fine to coarse grain size fractions. Occurrences of the Carolina heelsplitter have been correlated with stream habitat complexity characterized as shaded, stable stream banks, and the presence of undercut banks, root wads, and large woody debris.

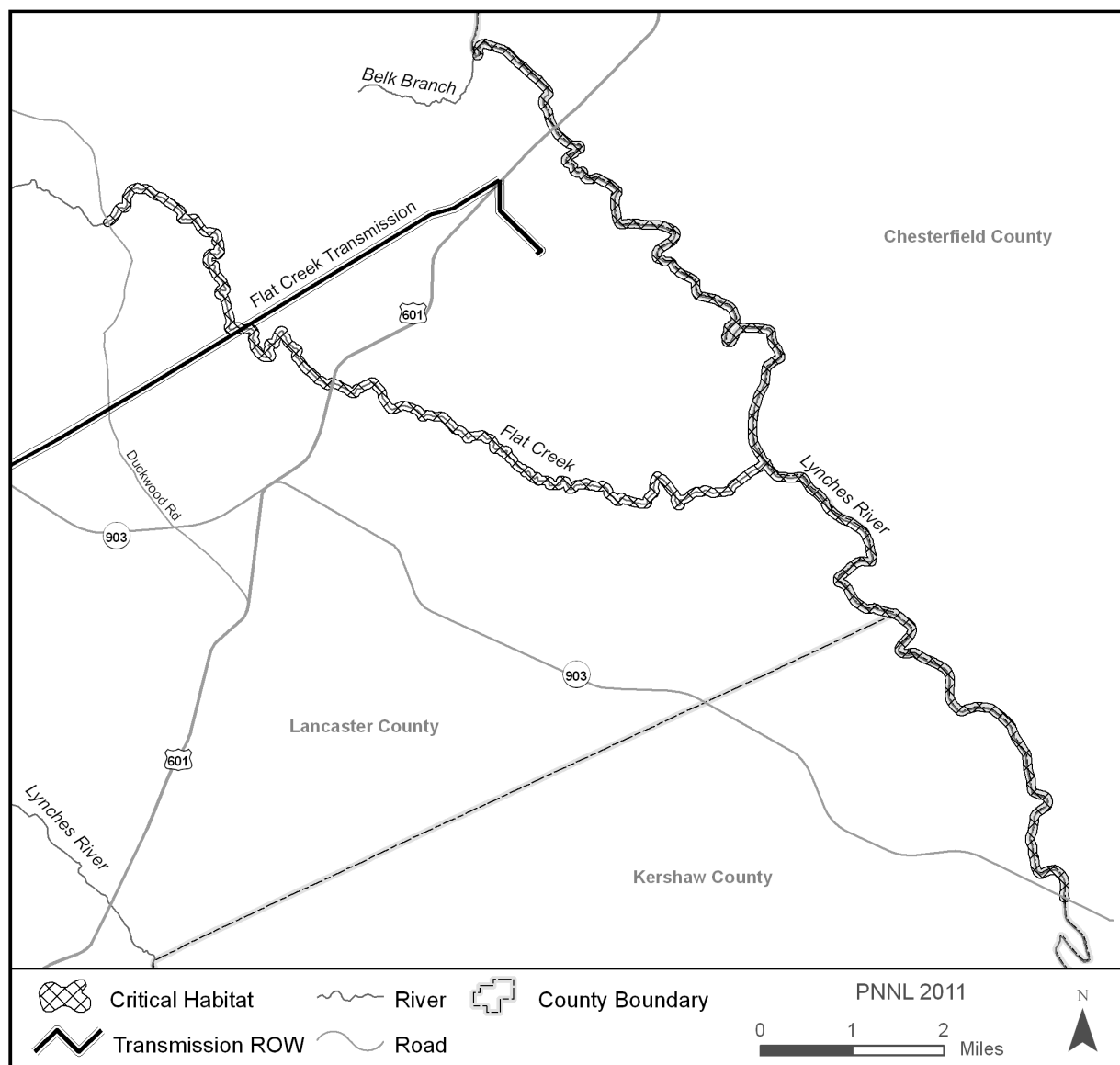
Designated critical habitat includes 103.2 km of streams and rivers in South Carolina that occur in conjunction with the known populations. The lateral boundaries of the critical habitats for the Carolina heelsplitter are denoted by the ordinary high water mark along channel edges (67 FR 44502). Designated critical habitats for the Carolina heelsplitter do not occur in the vicinity of the VCSNS site, and the species has never been found in the Parr and Monticello reservoirs or in onsite creeks and streams.

The routing of Santee Cooper transmission line corridors for VCSNS Units 2 and 3 is proposed to occur within two South Carolina counties that contain critical habitat for the Carolina heelsplitter: Chester and Lancaster Counties. The VCSNS-Flat Creek line will require a new corridor crossing Fishing Creek Reservoir (Catawba River impoundment) in Lancaster County near drainages known to support the Carolina heelsplitter. The known Gills Creek population is upstream from the location of the proposed new corridor, approximately 15 mi north and 12 mi northeast (MACTEC 2010). However, the existing VCSNS-Flat Creek corridor crosses a portion of Flat Creek in Lancaster County that is listed by FWS as critical habitat (Figure 2), and supports the Lynches River/Flat Creek population of Carolina heelsplitter.

The Carolina heelsplitter is known to occur within 1 mi of the existing VCSNS-Varnville and VCSNS-Flat Creek lines at several locations in Richland and Lancaster Counties (SCDNR 2010b). The Carolina heelsplitter was included in the habitat survey of the 2.44 mi of proposed new VCSNS-Varnville corridor in Parr Reservoir. Survey efforts did not identify the occurrence of Carolina heelsplitter within the 2.44 mi segment of proposed new right-of-way, nor were any noteworthy habitat attributes that may support this species identified (MACTEC 2008, 2009).

GIS-based analysis confirms no spatial overlap in known locations of this species and SCE&G transmission lines (SCDNR 2010b). The Carolina heelsplitter may also occur within waterbodies in Fairfield, Lexington, and Newberry Counties, which will also contain transmission line corridors for VCSNS Units 2 and 3 (Figure 1). A portion of the VCSNS-Killian line falls within Fairfield County, near watersheds associated with Carolina heelsplitter habitat; however,

Pike (2010) reported no occurrences of the heelsplitter associated with this transmission line corridor. In addition, there are no designations for critical habitat, nor are there verified species occurrences within Fairfield, Lexington, and Newberry Counties (FWS 2010b).



**Figure 2.** Existing Portion of Santee Cooper VCSNS-Flat Creek Line Crossing of Carolina Heelsplitter Critical Habitat (MACTEC 2010; 67 FR 44502)

The use of BMPs for activities associated with preparation and installation of new transmission line corridors, upgrades to existing corridors and infrastructure, and corridor maintenance is expected to limit potential impacts on this species. Improvements to the existing VCSNS-Flat Creek transmission line corridor crossing Carolina heelsplitter critical habitat will not involve in-water structures. No in-water work will be conducted in Flat Creek during installation, normal maintenance or normal operation. Upgrades to the transmission lines will include placing new transmission poles within established corridor adjacent to and parallel with existing poles, which are 200 ft. away from the banks of Flat Creek on either side. The applicant will not drive

vehicles across Flat Creek, but may work along the shoreline for controlling vegetation. Vegetative management activities near Flat Creek critical habitat will comply with BMPs for corridor vegetation management near streams (Santee Cooper 2006; SCFC n.d.), and BMPs for stormwater management and minimization of erosion and sedimentation (SCDHEC 2003; 2005a; 2005b). Based on the information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the Carolina heelsplitter. In addition, based on the information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, critical habitat for the Carolina heelsplitter in Flat Creek.

**Smooth coneflower (*Echinacea laevigata*) (Endangered).** As described in the BA, smooth coneflower is found in meadows and open woodlands on basic or near neutral soils, often with eastern redcedar (*Juniperus virginiana*). Questions remain concerning the biology and natural distribution of this species in South Carolina (Nelson 2006). It is rare throughout its range and has sustained significant habitat loss, at least in part due to fire-suppression activities (Porcher and Rayner 2001).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that smooth coneflower is known to occur in the project area in Richland County and may possibly also occur in Lexington County (SCDNR 2010a; FWS 2010b). There is one recorded occurrence within 1 mi of one of the proposed transmission line corridor in Lancaster County (SCDNR 2010b).

As mentioned earlier, both utilities consulted soils maps to identify specific locations within the proposed project area where suitable habitat could be present (Palmetto 2010; MACTEC 2010). SCE&G and Santee Cooper identified 13 locations (10 in the proposed SCE&G transmission line corridors and 3 in the proposed Santee Cooper corridors) having site characteristics (i.e., alkaline soils) capable of supporting smooth coneflower. But no occurrences of smooth coneflower were found during targeted field surveys of the 13 locations conducted in September, October, and November 2010 (which includes part of the flowering season) (Palmetto 2010; MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the smooth coneflower.

**Rough-leaved loosestrife (*Lysimachia asperulifolia*) (Endangered).** As described in the BA, rough-leaved loosestrife occurs in ecotones between longleaf pine uplands and pond pine pocosins (upland swamps) in moist, sandy, or peaty soils with low vegetation. It has also been found to occur in disturbed areas such as roadside depressions, powerline rights-of-way, firebreaks, and trails (NatureServe 2009).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that rough-leaved loosestrife is known to occur in the project area in Richland County (SCDNR 2010a; FWS 2010b). There were no recorded occurrences of rough-leaved loosestrife in or within 1 mi of any of the proposed transmission line corridors (SCDNR 2010b). SCE&G and Santee Cooper identified 29 sites having high potential for occurrence of rough-leaved loosestrife. No occurrences of rough-leaved loosestrife were found during targeted field surveys of the 29 locations conducted in September, October, and November 2010 (Palmetto 2010;

MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is not likely to adversely affect, the rough-leaved loosestrife.

**Canby's dropwort (*Oxypolis canbyi*) (Endangered).** As described in the BA, Canby's dropwort grows in wet meadows, wet pine savannahs, shallow pineland ponds, and cypress-pine swamps (NRC 2004).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that Canby's dropwort is known to occur in the project area in Richland County (SCDNR 2010a; FWS 2010). There were no recorded occurrences of Canby's dropwort in or within 1 mi of the proposed transmission line corridors (SCDNR 2010b). The closest known population of this species to the proposed Santee Cooper transmission line corridor occurs approximately 1.5 mi from an existing corridor in Orangeburg County (MACTEC 2010).

Twenty wetland depressions along the VCSNS-St. George No. 1 and No. 2 corridor were identified by reconnaissance studies and were subsequently field-checked in November 2010 (Palmetto 2010). Of the 20 wetland depressions that were field-checked, only one of them contained suitable habitat for Canby's dropwort (Palmetto 2010). The wetland depression was then surveyed for the presence of Canby's dropwort and none was found (Palmetto 2010). The closest known population of Canby's dropwort is approximately 1.5 mi from an existing Santee Cooper corridor in Orangeburg County (MACTEC 2010). Nine sites were identified as having high potential for Canby's dropwort to occur, but those sites were subsequently ground surveyed and found to not contain suitable habitat, or no species present (MACTEC 2010). In addition, limited visual reconnaissance was carried out in areas with moderate potential along existing and new corridors and all areas were found to either have unsuitable habitat or the species was not present (MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, Canby's dropwort.

**Pool sprite (*Amphianthus pusillus*) (Threatened).** As described in the BA, pool sprite, also known as little amphianthus, occurs in small (usually less than 1 m<sup>2</sup>) shallow pools on the crests and flattened slopes of granite outcrops and requires ideal moisture and light conditions for successful seed germination (FWS 2008b). Pool sprite is endemic to open flat granite rocks, with enough surface area to allow the development of shallow pools that fill with water during spring rainy periods when the seeds germinate, followed by rapid growth, flowering, and fruit setting (NRC 2003). The entire life span of this delicate plant is only 3 to 4 weeks (FWS 2008).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that pool sprite is known to occur in the project area in Lancaster County (SCDNR 2010a; FWS 2010). There is one recorded occurrence of pool sprite within 1 mi of a proposed transmission line corridor in Lancaster County (SCDNR 2010b).

Biologists reviewed aerial photography to identify granite outcrops along the proposed new right-of-way that might be capable of supporting pool sprite. They subsequently field-verified the outcrops and found that none appeared to contain suitable habitat for pool sprite (MACTEC 2010). Based on the 2010 survey observations and the other information

summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, the pool sprite.

**Schweinitz's sunflower (*Helianthus schweinitzii*) (Endangered).** As described in the BA, Schweinitz's sunflower is a shade-intolerant perennial herb that produces solitary stems up to 2 m tall and bears yellow flower heads in late summer and early autumn. This species requires full to partial sun and prefers Piedmont longleaf pine forest clearings and edges. Adapted to high-frequency, low-intensity fires, this species occurs mostly in transmission line corridors and along roadsides because fire-suppression activities throughout its range have depleted suitable natural habitat (NatureServe 2009).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that Schweinitz's sunflower is known to occur in the project area in Lancaster County (SCDNR 2010a; FWS 2010b). There were no recorded occurrences of this species in or within any of the proposed transmission line corridors (SCDNR 2010b).

Biologists identified five locations having high potential for Schweinitz's sunflower and subsequently performed ground surveys of each for Schweinitz's sunflower (MACTEC 2010; Palmetto 2010). No Schweinitz's sunflowers were found at any of the locations. In addition, field teams conducted limited visual reconnaissance for this species in other areas having only moderate potential for this species along proposed existing and new right-of-way, but no individuals or suitable habitat were found (MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, Schweinitz's sunflower.

**Black-spored quillwort (*Isoetes melanospora*) (Endangered).** As described in the BA, black-spored quillwort is a granite outcrop species that is inconspicuous, generally under 8 cm tall. Like the pool sprite, another granite outcrop species, the black-spored quillwort is restricted to shallow, flat-bottomed depressions on granitic outcrops, where water collects after rain. These depressions are less than 1 cm deep and usually contain soil at least 2 cm deep (NatureServe 2009).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that black-spored quillwort is known to occur in the project area in Lancaster County at Forty Acre Rock (SCDNR 2010a; FWS 2010b). There was one recorded occurrence of this species within 1 mi of a proposed transmission line corridor in Lancaster County (SCDNR 2010b).

Biologists used aerial photography to identify granite outcrops in Lancaster County along the proposed new right-of-way. They then conducted field surveys at each potentially favorable location and found that none contained suitable habitat for black-spored quillwort (MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, the black-spored quillwort.

**Pondberry (*Lindera melissifolia*) (Endangered).** As described in the BA, pondberry is a deciduous aromatic shrub that ranges from 0.5 to 2 m tall and usually grows in clumps in a variety of seasonal wetland habitats throughout the region (NatureServe 2009). Its flowering



period is from late February to mid-March; its fruiting period is from August to early October. Searches for this species can be performed throughout the entire growing season, because masses of yellowish flowers are produced prior to leafing out, making the thicket-forming shrubs conspicuous, and leaves are diagnostic when combined with growth habit and/or fruit (USDA 2009). Habitat alteration and loss are the most considerable threats to this species (NatureServe 2009).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that pondberry is known to occur in the project area in Colleton and Dorchester Counties (SCDNR 2010a; FWS 2010b). There were no recorded occurrences of this species in or within 1 mi of the proposed transmission line corridors (SCDNR 2010b).

Biologists identified six locations having high potential for pondberry and conducted ground surveys at each location (MACTEC 2010). No individuals or suitable habitat were found at any of the locations (MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, pondberry.

**American chaffseed (*Schwalbea americana*) (Endangered).** As described in the BA, American chaffseed is a monotypic perennial in the figwort family and is found in open pine flatwoods and savannas in moist-to-dry acidic sandy loam soils to sandy peat loams (FWS 1995). Flowering occurs between April and June, which is the best time to survey for this species, but the dark brown stems are distinctive and easy to identify after flowering (FWS 1995).

When reviewed in 2010, the SCDNR elemental occurrence database indicated that American chaffseed is known to occur in the project area in Colleton County (SCDNR 2010a; FWS 2010). There were no recorded occurrences of this species in or within 1 mi of the proposed transmission line corridors (SCDNR 2010b).

Biologists identified four locations in the Santee Cooper proposed transmission line corridors containing potentially suitable habitat for American chaffseed. They then conducted ground surveys at each and did not find any species or suitable habitat (MACTEC 2010). Based on the 2010 survey observations and the other information summarized above, the review team concludes that the proposed action may affect, but is unlikely to adversely affect, American chaffseed.

## 4.0 Conclusions

Determinations reached by NRC and USACE regarding potential impacts from building and operating the proposed transmission system on the species and critical habitat listed in Table 1 are presented in Table 3.

**Table 3.** Determinations Reached by NRC and USACE for Federally Listed Species and Critical Habitat Potentially Affected by Building and Operating Proposed VCSNS Units 2 and 3 and Associated Transmission Lines

Scientific Name	Common Name	Status	Determination
<b>Birds</b>			
<i>Mycteria americana</i>	Wood stork	E	May affect; not likely to adversely affect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	May affect; not likely to adversely affect
<b>Amphibians</b>			
<i>Ambystoma cingulatum</i>	Flatwoods salamander	T	May affect; not likely to adversely affect
<b>Mollusks</b>			
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	May affect, not likely to adversely affect
<b>Vascular Plants</b>			
<i>Amphianthus pusillus</i>	Pool sprite	T	May affect; not likely to adversely affect
<i>Echinacea laevigata</i>	Smooth coneflower	E	May affect; not likely to adversely affect
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	May affect; not likely to adversely affect
<i>Isoetes melanospora</i>	Black-spored quillwort	E	May affect; not likely to adversely affect
<i>Lindera melissifolia</i>	Pondberry	E	May affect; not likely to adversely affect
<i>Lysimachia asperulifolia</i>	Rough-leaved loosestrife	E	May affect; not likely to adversely affect
<i>Oxypolis canbyi</i>	Canby's Dropwort	E	May affect; not likely to adversely affect
<i>Schwalbea americana</i>	American chaffseed	E	May affect; not likely to adversely affect
<b>Critical Habitat</b>			
for <i>Lasmigona decorata</i>	Flat Creek	CH	May affect; not likely to adversely affect

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**SUPPLEMENTAL INFORMATION TO BIOLOGICAL  
ASSESSMENT PREPARED FOR NATIONAL MARINE  
FISHERIES SERVICE**

**Virgil C. Summer Nuclear Station  
Combined License Application**

**U.S. Nuclear Regulatory Commission Combined License Application  
Docket No. 52-027 and 52-028  
Department of the Army Permit Application  
No. SAC 2007-1852-SIR**

## 1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from South Carolina Electric & Gas (SCE&G) acting for itself and Santee Cooper (the State-owned electric and water utility, formally called the South Carolina Public Service Authority) for combined construction permits and operating licenses (combined licenses or COLs). The proposed actions related to the SCE&G application are (1) NRC issuance of COLs for two new nuclear power reactor units (Units 2 and 3) at the Virgil C. Summer Nuclear Station (VCSNS) site in Fairfield County, South Carolina, and (2) U.S. Army Corps of Engineers (USACE) permit action on a Department of Army Individual Permit application to perform certain activities on the site. The USACE is participating with the NRC in preparing the draft and final environmental impact statement (EIS) for these proposed actions as a cooperating agency and participates collaboratively on the review team.

As part of the NRC's responsibilities under Section 7 of the Endangered Species Act (ESA), the review team prepared a biological assessment (BA) in connection with the VCSNS COLs review (NRC 2010). In the BA, the review team did not consider potential impacts stemming from activities such as installation of water-intake structures in Monticello Reservoir, a discharge structure in Parr Reservoir, and other onsite preparation activities, because the shortnose sturgeon (*Acipenser brevirostrum*) had not been reported to occur in the vicinity of the VCSNS site (FWS 2010). In addition, the Parr Shoals Dam on the Broad River downstream of the VCSNS site prevents upstream migration of this anadromous species (SRBA 2008). The BA did, however, document potential impacts on the shortnose sturgeon as a result of proposed transmission-line routing activities. The NRC submitted the BA to the National Marine Fisheries Service (NMFS) on April 15, 2010. In the BA, the review team concluded that the activities associated with the transmission-line routing (e.g., corridor preparation, tower placement, and maintenance) would not be likely to adversely affect or jeopardize the continued existence of the shortnose sturgeon in Aiken, Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, or Richland Counties of South Carolina. In its draft EIS (NRC 2010) supporting the review of the COLs application, the review team also analyzed the impacts of transmission-line routing and concluded that transmission-line routing would be unlikely to adversely impact shortnose sturgeon.

The review team has prepared this technical memo to account for new transmission-line routing information provided by the applicant since the initial BA was submitted to the NMFS. In addition, on October 6, 2010, NMFS published in the *Federal Register* (75 FR 61904) a proposed rule for listing the Carolina and South Atlantic distinct population segments of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) as endangered under the ESA. To address this development, this technical memo describes the potential effect of transmission-line routes associated with VCSNS Units 2 and 3 on the Atlantic sturgeon. In addition, the technical memo provides an evaluation of potential impacts on Federally or proposed Federally listed species near the vicinity of the VCSNS site that may result from future restoration activities in the Broad River basin as well as cumulative impacts on sturgeon from other projects within the basin.

**Table 1.** Federally Listed and Proposed for Listing Aquatic Species That May Occur in Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, or Richland Counties, South Carolina

Scientific Name	Common Name	Federal Status	County of Occurrence
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered	Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, Richland
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	Proposed Endangered	Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, Richland *
<i>Caretta caretta</i>	Loggerhead sea turtle	Threatened	Colleton
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	Endangered	Colleton
<i>Chelonia mydas</i>	Green sea turtle	Endangered	Colleton
<i>Dermochelys coriacea</i>	Leatherback sea turtle	Endangered	Colleton

Data Source: FWS 2010; \* ASSRT 2007

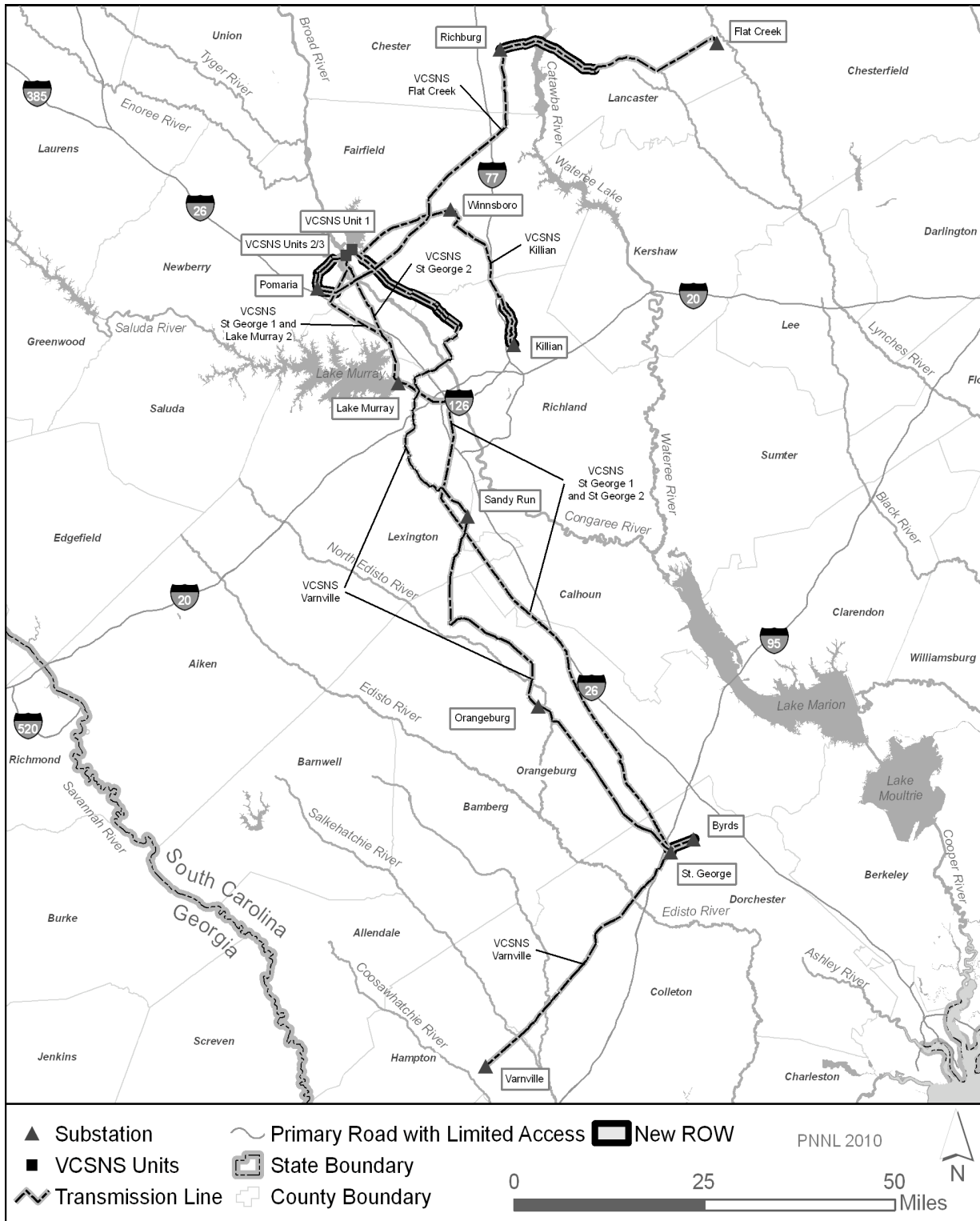
## 2.0 Proposed Action

Information pertaining to the Broad River, Parr Reservoir, Monticello Reservoir, and onsite streams associated with the VCSNS site was described in the initial BA published in draft NUREG-1939 in April 2010 (NRC 2010). No updates of information about these waterbodies are necessary for this technical memo. In the fall of 2010, the applicant provided final transmission-line routing information for VCSNS Units 2 and 3 and this resulted in a reduction of total acres of freshwater crossed by transmission-line corridors from approximately 98 ac to 53 ac. The six new lines include proposed corridors that would occur in the Southern Outer Piedmont, Sandhills, and Coastal Plain ecoregions of South Carolina (USGS 2001; Pike 2010; MACTEC 2008, 2009; SCE&G 2010a).

The existing transmission system for VCSNS is owned by SCE&G and Santee Cooper. Six new 230-kV transmission lines would be required in addition to the existing transmission infrastructure for transmission of electricity generated by VCSNS with the addition of Units 2 and 3 (SCE&G 2010b). Activities associated with the SCE&G and Santee Cooper transmission systems would include clearing land, installing new poles, hanging new lines, and upgrading existing lines. Figure 1 shows the proposed revised routing for the six new transmission lines. The corridors are described as follows:

- VCSNS-Flat Creek – This line is owned by Santee Cooper and crosses Fairfield, Chester, and Lancaster Counties.
- VCSNS-Varnville – This line is owned by Santee Cooper and crosses Fairfield, Newberry, Richland, Lexington, Calhoun, Orangeburg, Dorchester, Colleton, and Hampton Counties.
- VCSNS-Killian – This line is owned by SCE&G and crosses Fairfield and Richland Counties.





**Figure 1.** VCSNS Units 2 and 3 expected New Transmission-Line Routes (based on MACTEC 2009 and Pike 2010)

## Appendix F

- VCSNS-Lake Murray No. 2 and St. George No. 1 – This line is owned by SCE&G and crosses Fairfield, Richland, and Lexington Counties.
- VCSNS-St. George No. 2 – This line is owned by SEC&G and crosses Fairfield and Lexington Counties.
- VCSNS-St. George No. 1 and No. 2 – This line would be a double-circuit line (two lines) owned by SCE&G and it would cross Fairfield, Newberry, Lexington, Calhoun, Orangeburg, and Dorchester Counties.

Impacts on the waterways associated with transmission-line activities include erosion of soils, potential for pollutant discharge from equipment, and temporary disturbance and/or displacement of aquatic biota. Both SCE&G and Santee Cooper would implement best management practices (BMPs) to minimize adverse conditions for aquatic biota and habitats during transmission-line installation. Examples of BMPs to minimize impacts on streams and open water include establishment of sediment basins, sediment traps, and silt fences to control and divert runoff away from streams, and maintenance of stream buffers (FP&S 2008). In addition, both Santee Cooper and SCE&G have acknowledged the need for acquiring State and Federal permits and the incorporation of BMPs and Storm Water Pollution Prevention Plans (SWPPPs) into said permits (MACTEC 2008; FP&S 2008). SCE&G stated that it “will comply with the S.C. Stormwater Management and Sediment Reduction Act related to water quality protection and will comply with the recommendations of various regulatory agencies, including the S.C. Department of Natural Resources, S.C. Department of Health and Environmental Control, the U.S. Army Corps of Engineers, etc.” (FP&S 2008).

### ***SCE&G Transmission Lines***

Four lines occupying three corridors would be required to carry the SCE&G-owned transmission lines. These lines would occupy an estimated 147 mi of existing transmission-line corridors and 6 mi of new corridors (Figure 1). In addition, 5 mi of onsite lines to connect the VCSNS Unit 1 switchyard with the switchyard for VCSNS Units 2 and 3 would include 11 stream crossings (Pike 2010). The new 6-mi segment of the VCSNS-Killian transmission-line corridor does not cross waterbodies with known occurrences of shortnose (FWS 2010) or Atlantic sturgeon (ASSRT 2007), but may have habitat characteristics that could support these species (Palmetto 2010). The activities associated with the remaining 141 mi of existing SCE&G transmission-line corridors would include clearing land, building a new substation, installing new poles, hanging new lines, and upgrading existing lines. The SCE&G transmission lines associated with VCSNS Units 2 and 3 would include 220 stream and river crossings throughout the Piedmont and Coastal Plain ecoregions of South Carolina (Figure 1; Table 2). None of the SCE&G transmission line crossings will span Federal navigable waters requiring authorization pursuant to Section 10 of the Rivers and Harbors Act (SCE&G 2011).

**Table 2.** Stream Crossings, Open Water, Linear Feet of Stream, and Area Associated with the SCE&G and Santee Cooper Transmission Lines

Transmission-Line Route	Utility	Streams		Number of Stream Crossings	Area to be Cleared Within 100 ft of a Waterbody (ac)
		(linear feet)	Open Water (ac)		
Onsite Connector Lines**	SCE&G	1555 <sup>(a)</sup>	0	11 <sup>(a)</sup>	6.2
VCSNS-Killian**	SCE&G	5194	0.81	45	5.3
VCSNS-Lake Murray No. 2 and VCSNS-St. George No. 1 common corridor	SCE&G	5017	1.09	35	15.3
VCSNS-St. George No. 1 and VCSNS-St. George No. 2 common corridor	SCE&G	20,675	9.9	99	6.9
VCSNS-St. George No. 2	SCE&G	5339	0.35	30	2.2
<i>Sub Total</i>		<i>37,780</i>	<i>12.15</i>	<i>220</i>	<i>35.9</i>
VCSNS-Varnville	Santee Cooper	37,987	17.94	177	<sup>(b)</sup>
VCSNS-Flat Creek <sup>(c)</sup>	Santee Cooper	26,491	14.45	151	<sup>(b)</sup>
<i>Sub Total</i>		<i>64,478</i>	<i>32</i>	<i>328</i>	<sup>(b)</sup>
<i>Grand Total</i>		<i>102,258</i>	<i>45</i>	<i>548</i>	<i>35.9</i>

Source: USACE 2010 except for onsite connector lines, and clearing within 100 ft of a waterbody (Pike 2010).

(a) Onsite connector lines are located in areas covered by USACE's (2009) onsite wetland jurisdictional determination as well as offsite transmission-line determination (USACE 2010). Stream crossings and lengths for onsite connector lines were obtained by overlaying transmission-line and delineated wetlands GIS layers (SCE&G 2010c).

(b) Data not provided.

(c) These transmission-line corridors are not associated with waterbodies that are known to support shortnose and/or Atlantic sturgeon.

### **Santee Cooper Transmission Lines**

Two transmission lines would be installed by Santee Cooper: the VCSNS-Flat Creek and the VCSNS-Varnville lines. The VCSNS-Flat Creek line will extend 72 mi northeast from the VCSNS site to the existing Flat Creek Substation and requires approximately 17 miles of new corridor running adjacent to existing corridor (Figure 1). The VCSNS-Flat Creek line includes a new transmission-line corridor crossing of a Federal navigable water, the Fishing Creek Reservoir (Catawba River impoundment), and will therefore require authorization pursuant to Section 10 of the Rivers and Harbors Act (SCE&G 2011). Nevertheless, the VCSNS-Flat Creek line would not cross waterbodies that are known habitat for shortnose (FWS 2010) or Atlantic sturgeon (ASSRT 2007).

The VCSNS-Varnville line would extend 167 mi south from the VCSNS site to the existing Varnville substation, and require approximately 22 mi of new corridor running adjacent to

existing corridor and approximately 0.5 mi of new corridor not adjacent to existing corridor (Figure 1). The VCSNS-Varnville line includes three new transmission-line corridor crossings of waterbodies: Parr Reservoir (Broad River impoundment) in Fairfield and Newberry Counties, as well as Little River and Cedar Creek, both tributaries to the Broad River, in Richland County (MACTEC 2010). The new VCSNS-Varnville transmission-line corridor in Dorchester County will not cross any river systems that support shortnose sturgeon (MACTEC 2010). Within the existing transmission-line corridors on the VCSNS-Varnville line, crossings of Federal navigable waters are planned in seven existing locations (SCE&G 2011). These crossings will require authorization pursuant to Section 10 of the Rivers and Harbors Act: North Fork Edisto River (two crossings), Edisto River (four crossings), and the Salkehatchie River (SCE&G 2011).

Activities associated with the installation of the Santee Cooper transmission lines would include clearing land, upgrading existing substations, installing new poles, replacing old poles, and hanging new lines on existing supports (MACTEC 2008, 2009). In addition, the proposed new 100-ft-wide Parr Reservoir transmission-line corridor, to be sited adjacent to the existing VCSNS-Varnville line crossing, would require the installation of concrete pile foundations within the reservoir, but no dredging would be required (SCE&G 2009). Santee Cooper would prepare a SWPPP, in accordance with South Carolina Department of Health and Environmental Control (SCDHEC) guidance (SCDHEC 2002), for minimization of impacts on sediment quality during installation activities (MACTEC 2009).

The Santee Cooper transmission lines associated with VCSNS Units 2 and 3 would include 328 stream and river crossings throughout the Piedmont and Coastal Plain ecoregions of South Carolina (Figure 1; Table 2) (MACTEC 2008). An estimated 11 percent of the total Santee Cooper water crossings are associated with new transmission-line corridor (review team analysis of GIS-based routing data supplied by the applicant). A combined 551 linear feet of forested stream habitat would be converted to nonforested stream habitat through preparation of the VCSNS-Varnville transmission-line corridor. Clearing of vegetation associated with Santee Cooper transmission lines would occur within new transmission-line corridors (50 to 125 ft wide) as well as existing corridors (50 to 85 ft wide) (MACTEC 2009).

### **3.0 Protected Species Descriptions**

The initial BA, published in draft NUREG-1939 in April 2010 (NRC 2010) examined the effects of the proposed action on five Federally threatened or endangered aquatic species that are known to occur in several counties in South Carolina proposed for transmission-line corridor routing for transmission of power from VCSNS Units 2 and 3. An additional species – the Atlantic sturgeon – was added since the publication of draft NUREG-1939 as described below (Table 1). The review team determined that all proposed transmission-line routing activities for VCSNS Units 2 and 3 would occur in noncoastal areas of Colleton County, therefore negating potential impacts on sea turtle species. As such, the four Federally listed sea turtles associated with Colleton County were not further considered in the BA. A biological description for shortnose sturgeon was provided in the initial BA and will therefore not be included in this document.

## **Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)**

Based on the information published by the Atlantic Sturgeon Status Review Team (ASSRT 2007), the review team identified the Atlantic sturgeon as being present within the Ashepoo-Combahee-Edisto basin. The Atlantic sturgeon is a member of the Order Acipenseriformes, which includes the long-lived sturgeons and paddlefishes. The Atlantic sturgeon is not currently listed as threatened or endangered either Federally or by the State of South Carolina. However, on October 6, 2010, the NMFS published in the *Federal Register* (75 FR 61904) a proposed rule for listing the Carolina and South Atlantic distinct population segments of the Atlantic sturgeon as endangered under the ESA.

### ***Atlantic Sturgeon Biology***

Broadly, Atlantic sturgeon exhibit life-history strategies akin to other members of the Family Acipenseridae. These attributes include slow-growing, late-maturing, anadromous fish that spawn in freshwater but make use of estuarine and marine habitats for much of their life cycle (ASSRT 2007). Atlantic sturgeon are opportunistic feeders, targeting a range of prey items within the benthos which includes worms, crustaceans, aquatic insect larvae, and sand lances (Jenkins and Burkhead 1994). Characteristics of the early life-history attributes of Atlantic sturgeon such as age at seaward migration and residence time in freshwater habitats vary within natal streams as well as across geographic regions (Jenkins and Burkhead 1994). Juveniles migrate from spawning areas toward saline habitats where individuals spend months to years rearing in estuarine environments. Migration toward marine environments occurs during subadult life stages when fish achieve sizes ranging from 72 to 92 cm. In marine environments, Atlantic sturgeon make extensive migrations from their natal estuary presumably to productive foraging grounds (ASSRT 2007). The age at maturation is variable and ranges from 10 to 30 years, depending on the sex of a particular organism as well as other environmental and physiological conditions (Jenkins and Burkhead 1994).

### ***Atlantic Sturgeon in South Carolina Rivers***

According to ASSRT (2007), it is likely that Atlantic sturgeon once occurred in many riverine and estuarine ecosystems within South Carolina. It is likely that dramatic changes to historic populations of Atlantic sturgeon occurred following the 1800s. Declining populations have been attributed to harvest pressure as well as the loss and degradation of habitats suitable for supporting various life stages of these species. While Atlantic sturgeon have been noted to occur in many South Carolina coastal rivers during the past several decades, specific information detailing population records for each of these rivers is not readily available (ASSRT 2007).

There appears to be little quantitative evidence linking the occurrence of Atlantic sturgeon in specific streams and rivers to spawning populations in South Carolina. However, in the absence of empirical data, the co-occurrence of young-of-the-year (YOY) and adult life stages within a given river provide data to inform hypotheses regarding spawning populations. Subadult and YOY Atlantic sturgeon were captured during 2003 and 2004 in the Waccamaw River. A combination of direct capture and observation records of Atlantic sturgeon has been noted in the Great Pee Dee River. In the Santee and Cooper Rivers, subadult and YOY Atlantic

sturgeon were captured during 1997 and 2004. Carcasses of three adult Atlantic sturgeon were found above the Wilson and Pinopolis dams in Lake Moultrie during the 1990s. However, while a fish lift at the St. Stephen Hydroelectric Project operates to pass fish during the spring, there have been no observations of an adult Atlantic sturgeon passing this facility. A combination of YOY and adult Atlantic sturgeon were captured from the Edisto and Combahee rivers from 1994 to 2001, providing evidence of spawning populations in these rivers. Similarly, YOY and adult Atlantic sturgeon have also been captured in the Savannah River.

South Carolina rivers with recent documented occurrences of Atlantic sturgeon include the Waccamaw, Pee Dee, Santee, Cooper, Edisto, Combahee, Coosawatchie, and Savannah rivers (Figure 2) (ASSRT 2007). Atlantic sturgeon have not been reported to occur in the vicinity of the VCSNS site or in waterbodies (Little River and Cedar Creek which are tributaries to the Broad River, the Broad River, and the Catawba River) that would be crossed by the new transmission-line corridors required for the VCSNS Units 2 and 3. However, Atlantic sturgeon may occur in waterbodies spanned by the existing VCSNS-Varnville transmission-line corridor (MACTEC 2010). The VCSNS-Varnville transmission-line corridor crosses the Edisto River southwest of the St. George substation (Figure 2), which is the only waterbody known to have reported occurrences of Atlantic sturgeon associated with the proposed VCSNS Units 2 and 3 transmission-line systems (ASSRT 2007). The transmission-line routing activity at this location is limited to updating the existing corridor.

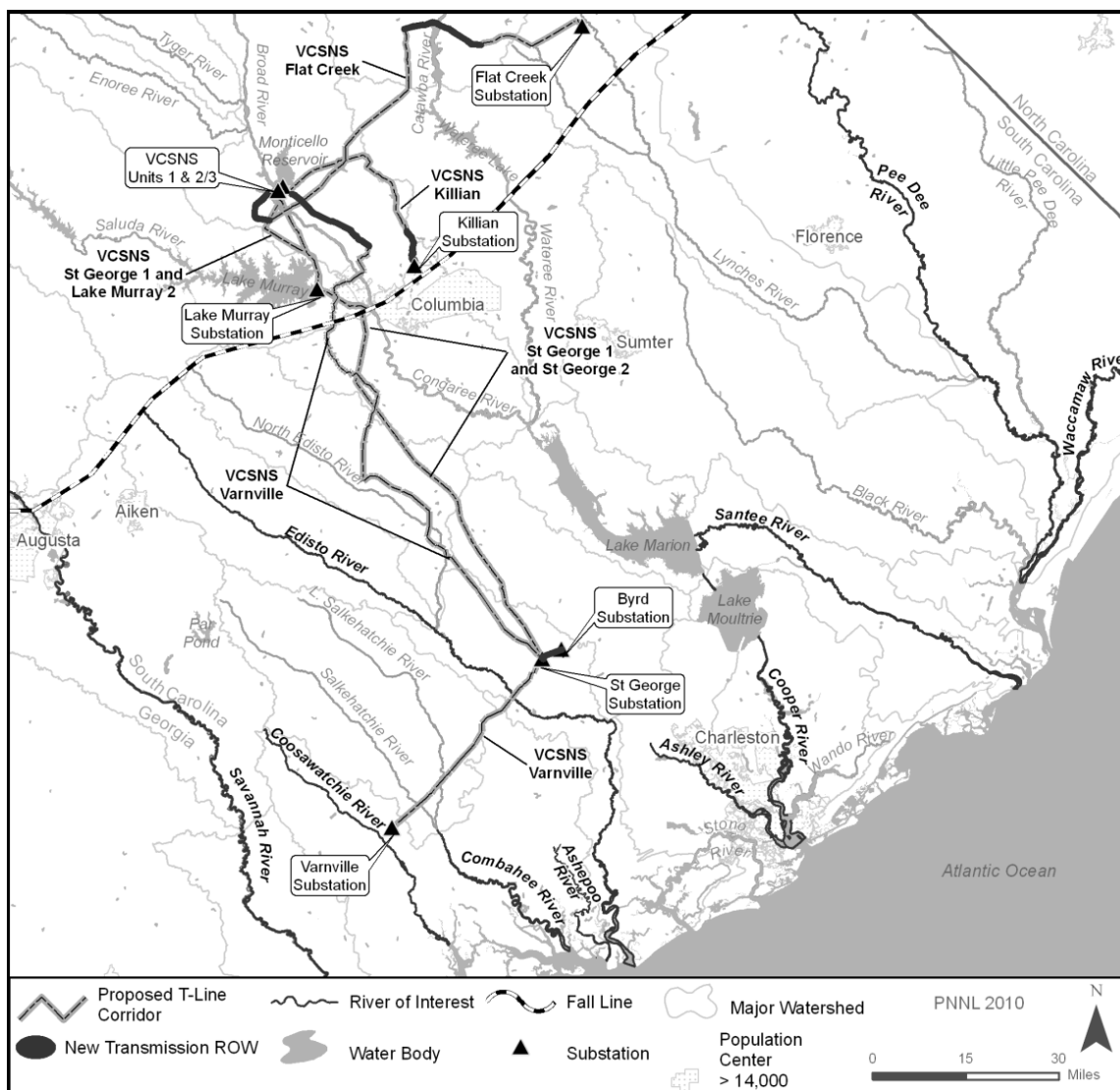
## **4.0 Potential Environmental Effects of the Proposed Actions**

This section describes the potential impacts from proposed transmission-line routing activities for VCSNS Units 2 and 3 on Atlantic and shortnose sturgeon in locations that correspond to the overlap between transmission-line crossings and reported occurrences of these two species.

### **Impacts of Construction**

There are presently no records of Atlantic and shortnose sturgeon in the vicinity of the proposed locations for VCSNS Units 2 and 3, therefore potential impacts stemming from activities such as installation of water-intake structures in Monticello Reservoir and a discharge structure in Parr Reservoir, and other onsite preparations are not considered in this analysis. An evaluation of potential impacts on Atlantic and shortnose sturgeon is limited to transmission-line routing activities.

Impacts on the waterways associated with transmission-line routing activities would include erosion of soils, potential for pollutant discharge from equipment, and temporary disturbance and/or displacement of aquatic biota. Both SCE&G and Santee Cooper plan to implement BMPs to minimize adverse conditions for aquatic biota and habitats during transmission-line installation and upgrading activities (e.g., leaving low-growing vegetation intact to provide stream buffer zones, hand clearing vegetation in forested wetlands, leaving root zones intact, setting structures on banks to divert runoff, implementing erosion control techniques) (MACTEC 2009; Pike 2010). In addition, both SCE&G and Santee Cooper have acknowledged the need



**Figure 2.** South Carolina Rivers with Recent Documented Occurrences of Atlantic Sturgeon Include Waccamaw, Pee Dee, Santee, Cooper, Edisto, Combahee, Coosawatchie, and Savannah Rivers (ASSRT 2007)

to acquire State and Federal permits and incorporate BMPs and SWPPPs into said permits (MACTEC 2009; Pike 2010). SCE&G states, “SCE&G will comply with the S.C. Stormwater Management and Sediment Reduction Act related to water quality protection and will comply with the recommendations of various regulatory agencies, including the S.C. Department of Natural Resources, S.C. Department of Health and Environmental Control, the U.S. Army Corps of Engineers, etc.” (Pike 2010).

There are few locations in which VCSNS Units 2 and 3 transmission lines would cross waterbodies known to provide habitat for Atlantic and shortnose sturgeon. The lower Edisto River and North Fork Edisto River would be crossed by the VCSNS-Varnville line. However, transmission line crossings within these routes are not associated with clearing new corridors and would be limited to updating or expanding existing infrastructure.

The review team evaluated the potential for shortnose and Atlantic sturgeon to be affected by the installation of new transmission lines. No direct impacts on the waterbodies crossed by the new transmission lines are anticipated; however, indirect impacts (e.g., potential for reduced shading and increased sedimentation) on waterbodies would likely occur in habitats that shift from forested to nonforested. Impacts associated with vegetation clearing are anticipated to be minor and would result in localized impacts adjacent to the waterbodies. By following State and Federal BMPs associated with water quality, the review team concludes that the impacts associated with transmission-line routing activities would be minimal and would not adversely affect aquatic ecosystems.

## Impacts of Operations

Maintenance activities associated with transmission lines may lead to temporary impacts on the waterways being crossed (Figure 2). However, the same vegetation-management practices currently used by SCE&G and Santee Cooper for the existing transmission-line corridors would be applied to the proposed new and upgraded transmission-line corridors (MACTEC 2009; Pike 2010). SCE&G and Santee Cooper practices and procedures were developed to ensure impacts on aquatic ecosystems from operation and maintenance of transmission lines would be minimal. Santee Cooper would continue to use its Right-of-Way Management Unit Plan, which addresses vegetation clearing or maintenance for stream buffer zones (MACTEC 2008). Only herbicides approved by the U.S. Environmental Protection Agency and registered for use in wetlands or aquatic sites would be used and their application would be limited to selective low-volume treatments aimed at controlling undesirable woody vegetation while still promoting low-growing native vegetation (MACTEC 2008). Low-growing vegetation along shorelines would be maintained as buffer zones (MACTEC 2008).

The review team concludes that based upon the right-of-way management and maintenance plans followed by SCE&G and Santee Cooper, the impacts of transmission-line corridor maintenance activities on aquatic resources would not adversely affect aquatic ecosystems.

## 5.0 Cumulative Effect on Diadromous Fish

The Santee-Cooper Basin Diadromous Fish Passage Restoration Plan (Plan) (FWS 2001) and the Santee River Basin Accord (Accord) (SRBA 2008) focus on restoring habitat connectivity for diadromous fish that were historically present within the basin. Target species include American eel (*Anguilla rostrata*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), hickory shad (*Alosa mediocris*), Atlantic sturgeon, and shortnose sturgeon. Objectives of the restoration plan include (1) increasing upstream passage for target fish species, (2) increasing downstream passage for target fish species, (3) restoring and maintaining adequate instream flows for fish migrations, (4) restoring and maintaining water-quality conditions, and (5) conserving, preserving, and restoring important habitats that support life-history strategies for migratory fish populations (FWS 2001).

Within the Santee-Cooper basin (Basin), the Plan identified the Broad River sub-basin as a high priority for restoration due to the amount of potential habitat available as well as the quality of



existing habitat. There is currently no evidence that the Plan's targeted diadromous fish species reside within the vicinity of the VCSNS, but there are documented historical accounts that these fish migrated to the upper reaches of the Broad River. Future restoration efforts may result in the reestablishment of migratory fish populations upstream of the Parr Shoals Dam.

In response to the Plan, hydroelectric utilities and State and Federal entities have enacted the Accord, which outlines a systematic plan for enhancing and restoring passage at specific dams within the Basin. Several dams along the Broad River are slated for fish passage restoration if biological criteria are met for selected diadromous fish species at downstream monitored locations (SRBA 2008).

With respect to future populations of migratory fish that may become established in the Broad River, impacts stemming from impingement and entrainment associated with VCSNS operations are unlikely because the existing VCSNS Unit 1 intake structure is currently located in Monticello Reservoir and the proposed VCSNS Units 2 and 3 combined intake structure would also be located in Monticello Reservoir. The operation of the multiport diffuser for blowdown effluent from VCSNS Units 2 and 3 would likely exclude access of aquatic biota in the immediate vicinity of the diffuser located in the eastern nearshore area of Parr Reservoir. In addition, many aquatic species are motile and would likely move to adjacent habitat and would not be affected by operational activities. Chemical concentrations in the blowdown effluent would be regulated by a National Pollutant Discharge Elimination System (NPDES) permit (SCE&G 2010b). The discharge of blowdown effluent may result in thermal impacts, but impacts on populations of aquatic biota would likely be minimal.

Cumulative impacts on aquatic resources within Monticello and Parr reservoirs may also include activities or events that are distinct from the VCSNS site. Water quality may be affected by discharges from other plants or facilities that maintain hydrologic connectivity to the Monticello and Parr reservoirs, such as treated wastewater discharge that enters Parr Reservoir through Cannons Creek with the current discharge point approximately 8 mi to the west of the VCSNS site. The Newberry County Water & Sewer Authority (NCW&SA) Broad River Wastewater-Treatment Plant (WWTP) had an active NPDES permit (SC0048020) for discharge of 0.05 million gallons per day (Mgd) to Cannons Creek. This discharge ultimately flowed into Parr Reservoir until cessation of permitted discharge in January of 2008 (EPA 2009a). Currently, the NCW&SA Cannons Creek WWTP has a current NPDES permit (SC0048313) with a discharge of 0.95 Mgd to Cannons Creek (EPA 2009b). Discharge from this operating WWTP is monitored for compliance with NPDES permitting regulations to ensure water-quality metrics do not exceed allowable levels. Given that current discharges do not exceed allowable levels, operation of the NCW&SA Cannons Creek WWTP has minor impacts on aquatic biota. The Blair Quarry, approximately 10 mi north of the VCSNS site in the vicinity of Neal Shoals Dam, has an active permit for granite mining. The Blair Quarry operates under a NPDES permit for minor industrial effluent to Rocky Creek, which feeds into the Broad River (SCDHEC 2007). Cumulative impacts on aquatic biota, including diadromous fish from these sources, are considered minor due to NPDES compliance and minimal effluent discharge.

Five hydropower facilities upstream of VCSNS on the Broad River are not expected to result in cumulative effects on water use because these facilities are run-of-river dams. However, due to the absence of fish passage facilities, these dams prohibit upstream migration of aquatic biota.

Planned diadromous fish restoration activities in the Broad River basin may improve fish passage in the future, which would result in minimal cumulative impacts.

Parr Shoals Dam is located approximately 1 mi downstream from the proposed discharge location (multiport diffuser) for VCSNS Units 2 and 3. The Parr Hydroelectric Plant at the Parr Shoals Dam generates up to 15 megawatts (MW) through operation of six turbine units (SCE&G 2010b). A minimum daily average flow of 800 cubic feet per second (cfs) results in the transport of aquatic biota within the influence of the turbine intake systems downriver below Parr Shoals. The operation of the hydroelectric plant influences aquatic communities within Parr Reservoir by preventing any organisms that pass through the hydropower facility from returning upstream of the facility. Future restoration efforts may result in the reestablishment of migratory fish populations upstream of the Parr Shoals Dam.

The operation of the Fairfield Pumped Storage Facility (FPSF), which can produce over 511 MW of electricity, results in a daily average fluctuation of 4 ft of water elevation in Parr Reservoir as water is pumped from the Parr Reservoir into Monticello Reservoir and then flows back to Parr Reservoir through the hydroelectric turbines (NRC 2004). The intake withdrawal rate from Monticello Reservoir for operation of VCSNS Units 2 and 3 composes a very small fraction of the FPSF pumping rate and would have little to no impact on water use. The combined VCSNS Units 2 and 3 intake rates are approximately 83 (normal) and 138 (max) cfs from Monticello Reservoir (SCE&G 2010b). Toblin (2007) estimates the hourly pumping rate at FPSF to be 19,255 cfs during power generation. Comparison of the VCSNS Units 2 and 3 intake rates (e.g., 83 and 138 cfs) to the FPSF pumping rate of 19,255 cfs shows that VCSNS Units 2 and 3 operations represent less than 1 percent of the flow of the FPSF during pumping operations from Parr Reservoir. It is therefore anticipated that operation of VCSNS Units 2 and 3 would not result in significant cumulative impacts with the current operation of the FPSF.

The cumulative impact of existing water uses on aquatic biota in Parr Reservoir, Monticello Reservoir, and the Broad River during drought conditions has also been considered. The Federal Energy Regulatory Commission (FERC) license for operation of the Parr Shoals Dam requires "...the flow shall be maintained at 1,000 cfs or at the average daily natural inflow into Parr Reservoir...during the striped bass spawning season in March, April, and May in order to protect the fishery of the Broad River" (SCE&G 2010b). The FERC license further states that minimum flow below the dam will be 800 cfs for the remainder of the year. During low-flow conditions in the Broad River, Monticello Reservoir can supply a total of 45,000 ac-ft of usable storage for cooling water for VCSNS Units 1 through 3. If drought conditions in the Broad River persist and the storage water from Monticello Reservoir is used before hydrologic conditions are restored, "...SCE&G would curtail or cease operation of VCSNS until water is available" (SCE&G 2010b). Due to the combination of FERC licensing conditions at the Parr Shoals Dam and the usable volume of water storage in Monticello Reservoir, cumulative impacts on aquatic biota, including diadromous fish, during drought conditions are expected to be minor.

Cumulative impacts on future populations of diadromous fish from operation of VCSNS Units 1 through 3 stemming from impingement, entrainment, and effluent discharge are expected to be minimal. Furthermore, potential impacts stemming from effluent discharge of other facilities in the vicinity of the VCSNS site are anticipated to be minimal as a result of NPDES compliance. FERC regulation of the Parr Shoals Dam during low-flow conditions is also anticipated to

minimize impacts on aquatic biota during drought conditions. Operation of FPSF may affect future diadromous fish populations. While the five hydropower facilities upstream of the VCSNS site prevent upstream access to aquatic habitats, future restoration at these facilities as well as the installation of fish passage facilities at the Parr Shoals Dam may increase habitat connectivity for anadromous fish in the Broad River. With the exception of the FPSF, the cumulative impacts from these past, present, and reasonably foreseeable actions are expected to have minor impacts and may result in potentially favorable conditions for diadromous fish. Impacts on future populations of diadromous fish from operation of FPSF are difficult to predict and when combined with other past, present, and reasonably foreseeable future impacts may or may not result in a noticeable cumulative impact due to the uncertainty involved in the success of habitat restoration and reestablishment by targeted species.

## 6.0 Conclusions

The potential impacts of proposed transmission-line routing activities for VCSNS Units 2 and 3 on Atlantic and shortnose sturgeon have been evaluated. The known distributions and records of the species and the potential ecological impacts of the construction and operation of VCSNS Units 2 and 3 and associated transmission lines and corridors on the species and its habitat have been considered in this supplement to the BA.

Based on this review, there is little potential for interaction between known habitat associations of Atlantic and shortnose sturgeon and transmission-line upgrades and maintenance proposed for VCSNS Units 2 and 3. While restoration efforts may result in the potential for future interaction between these anadromous species and plant operations, operational conditions, including thermal and chemical blowdown conditions which are regulated via State and Federal agencies, would impose small impacts on aquatic biota. Through implementation of appropriate State and Federal BMPs during transmission corridor preparation, tower placement, and corridor maintenance to protect water quality, the review team concludes that the overall effects of the construction and operation of the proposed new units at the VCSNS site and associated transmission lines and corridors would not be likely to adversely affect or jeopardize the continued existence of the Atlantic and shortnose sturgeon in Calhoun, Colleton, Dorchester, Hampton, Lexington, Orangeburg, or Richland Counties of South Carolina.

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## **Appendix G**

# **Supporting Documentation for Radiological Dose Assessment**





# Appendix G

## Supporting Documentation for Radiological Dose Assessment

The U.S. Nuclear Regulatory Commission (NRC) staff performed an independent dose assessment of the radiological impacts resulting from normal operation of the existing and proposed new nuclear units at and near the Virgil C. Summer Nuclear Station (VCSNS). The results of this assessment are presented in this appendix and are compared to the results from South Carolina Gas & Electric (SCE&G) found in Section 5.9, Radiological Impacts of Normal Operations. The appendix is divided into four sections: (1) dose estimates to the public from liquid effluents, (2) dose estimates to the public from gaseous effluents, (3) cumulative dose estimates, and (4) dose estimates to the biota from liquid and gaseous effluents.

### G.1 Dose Estimates to the Public from Liquid Effluents

The staff used the dose-assessment approach specified in Regulatory Guide 1.109 (NRC 1977) and the LADTAP II computer code (Streng et al. 1986) to estimate doses to the maximally exposed individual (MEI) and population from the liquid effluent pathway of the proposed VCSNS Units 2 and 3. The staff used the annual radioactive-effluent-release reports for the years 2005 and 2006 to estimate doses to the MEI and population from liquid effluent releases from the existing Unit 1 (SCE&G 2006, 2007).

#### G.1.1 Scope

Doses from the proposed new units to the MEI were calculated and compared with regulatory criteria for the following:

- Total Body – Dose was the total for all pathways (i.e., drinking water, fish consumption, irrigated crops, milk and meat produced on irrigated land, shoreline usage, swimming exposure, boating) with the highest value for either the adult, teen, child, or infant, compared to the 3 mrem/yr per reactor dose design objective in Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix I.

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- Organ – Dose was the total for each organ for all pathways (i.e., drinking water, fish consumption, irrigated crops, milk and meat produced on irrigated land, shoreline usage, swimming exposure, boating) with the highest value for either the adult, teen, child, or infant, compared to the 10 mrem/yr per reactor dose design objective specified in 10 CFR Part 50, Appendix I.

The staff reviewed the assumed exposure pathways and the input parameters and values used by SCE&G (2010) for appropriateness, including references made to the Westinghouse Advanced Passive 1000 (AP1000) pressurized water reactor Design Control Document (DCD) (Westinghouse 2008). Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available. The staff concluded that the assumed exposure pathways were reasonable, and that the input parameters and values used by SCE&G were appropriate.

### **G.1.2 Resources Used**

To calculate doses to the public from liquid effluents, the staff used a personal-computer (PC) version of the LADTAP II code entitled NRCDOSE, Version 2.3.8 (Chesapeake Nuclear Services, Inc. 2006) obtained through the Oak Ridge Radiation Safety Information Computational Center (RSICC).

### **G.1.3 Input Parameters**

Table G-1 lists the major parameters used in calculating dose to the public from liquid effluent releases during normal operation.

The Section 5.4.1 of the *Environmental Standard Review Plan* (ESRP) (NRC 2000) requires use of "...projected population for 5 years from the time of the licensing action" (Table G-2), resulting in collective doses that are overestimates of the collective dose that would be received by the significantly smaller population projected for about the year 2020 (5 years from the time of the licensing action under consideration). Because using the larger population results in a larger collective dose, the staff concludes this assumption is conservative.

SCE&G chose to use the discharge flow rate of  $1.78 \times 10^3$  ft<sup>3</sup>/s in its LADTAP II calculations, that is, the minimum historical flow rate of the Broad River (SCE&G 2010). This assumption will generally lead to an overestimation of doses from the liquid pathway to the MEI, the population, and to biota. The staff concludes that the low-flow assumption is conservative.

### **G.1.4 Comparison of Results**

Table G-3 presents a comparison of SCE&G's results for a single new unit with those determined by the staff. Doses calculated for the MEI and population were similar.

**Table G-1.** Parameters Used in Calculating Dose to the Public from Liquid Effluent Releases (1 Unit)

Parameter	Staff Value	Comments	
New unit liquid effluent source term (Ci/yr) <sup>(a)</sup>	H-3	$1.01 \times 10^3$	Values from Westinghouse AP1000 Design Control Document Table 11.2-7 for a single unit (Westinghouse 2008). Except for rounding differences, these values are the same as those reported in ER Table 3.5-1 (SCE&G 2010).
	Na-24	$1.63 \times 10^{-3}$	
	Cr-51	$1.85 \times 10^{-3}$	
	Mn-54	$1.30 \times 10^{-3}$	
	Fe-55	$1.00 \times 10^{-3}$	
	Fe-59	$2.00 \times 10^{-4}$	
	Co-58	$3.36 \times 10^{-3}$	
	Co-60	$4.40 \times 10^{-4}$	
	Zn-65	$4.10 \times 10^{-4}$	
	Br-84	$2.00 \times 10^{-5}$	
	Rb-88	$2.70 \times 10^{-4}$	
	Sr-89	$1.00 \times 10^{-4}$	
	Sr-90	$1.00 \times 10^{-5}$	
	Sr-91	$2.00 \times 10^{-5}$	
	Y-91m	$1.00 \times 10^{-5}$	
	Y-93	$9.00 \times 10^{-5}$	
	Zr-95	$2.30 \times 10^{-4}$	
	Nb-95	$2.10 \times 10^{-4}$	
	Mo-99	$5.70 \times 10^{-4}$	
	Tc-99m	$5.50 \times 10^{-4}$	
	Ru-103	$4.93 \times 10^{-3}$	
	Ru-106	$7.352 \times 10^{-2}$	
	Rh-106	$7.352 \times 10^{-2}$	
	Ag-110m	$1.05 \times 10^{-3}$	
	Ag-110	$1.40 \times 10^{-4}$	
	Te-129m	$1.20 \times 10^{-4}$	
	Te-129	$1.50 \times 10^{-4}$	
	Te-131m	$9.00 \times 10^{-5}$	
	Te-131	$3.00 \times 10^{-5}$	
	Te-132	$2.40 \times 10^{-4}$	
	I-131	$1.413 \times 10^{-2}$	
	I-132	$1.64 \times 10^{-3}$	
	I-133	$6.70 \times 10^{-3}$	
	I-134	$8.10 \times 10^{-4}$	
	I-135	$4.97 \times 10^{-3}$	
	Cs-134	$9.93 \times 10^{-3}$	
	Cs-136	$6.30 \times 10^{-4}$	
	Cs-137	$1.332 \times 10^{-2}$	
	Ba-137m	$1.245 \times 10^{-2}$	
	Ba-140	$5.52 \times 10^{-3}$	
	La-140	$7.43 \times 10^{-3}$	
Ce-141	$9.00 \times 10^{-5}$		
Ce-143	$1.90 \times 10^{-4}$		
Ce-144	$3.16 \times 10^{-3}$		
Pr-143	$1.30 \times 10^{-4}$		
Pr-144	$3.16 \times 10^{-3}$		
W-187	$1.30 \times 10^{-4}$		
Np-239	$2.40 \times 10^{-4}$		
All others	$2.00 \times 10^{-5}$		

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**Table G-1. (contd)**

<b>Parameter</b>	<b>Staff Value</b>	<b>Comments</b>
Freshwater site	Selected	Discharge is to the freshwater Parr Reservoir (Broad River).
Discharge flow rate (ft <sup>3</sup> /s)	1782	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Source-term multiplier	1	For one unit.
Reconcentration model	No impoundment	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Effluent discharge rate from impoundment system to receiving water body (ft <sup>3</sup> /s)	1782	Matches discharge flow rate for “no impoundment” model (Streng et al. 1986).
Impoundment total volume (ft <sup>3</sup> )	0	Set to zero for “no impoundment” model (Streng et al. 1986).
Shore-width factor	0.2	Suggested value for river shoreline (NRC 1977; Streng et al. 1986)
Dilution factors for aquatic food and boating, shoreline and swimming, and drinking water	1	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010). The value of “1” indicates no dilution.
Transit time (hr)	0.1	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010). A transit time of 96 hr is used for 50-mi population dose.
Consumption and usage factors for adults, teens, children, and infants	Shoreline usage (hr/yr)	
	12	(adult)
	67	(teen)
	14	(child)
	0	(infant)
	Water usage (L/yr)	
	730	(adult)
	510	(teen)
	510	(child)
	330	(infant)
	Fish consumption (kg/yr)	
	21	(adult)
	16	(teen)
6.9	(child)	
0	(infant)	
Total 50-mi population	2,131,000	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010). Population distribution used by SCE&G and the staff was for year 2060.
50-mi drinking water population	299,930	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total 50-mi sport fishing (kg/yr)	377,000	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).

Table G-1. (contd)

Parameter	Staff Value	Comments
Total 50-mi shoreline usage (person-hr/yr)	$3.59 \times 10^6$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total 50-mi swimming usage (person-hr/yr)	$3.59 \times 10^5$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total 50-mi boating usage (person-hr/yr)	$3.59 \times 10^6$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Fraction of SC crops irrigated	0.0696	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Fraction of population using contaminated water for drinking and food production	0.141	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Fraction of SC agricultural products within 50 mi radius	0.258	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Irrigation rate for food products (liters per square meter per month)	110	The same as 1 in. per week. Site-specific value used by applicant in LADTAP II Input. Value in Table 5.4-1 of the ER (SCE&G 2010) was 102.
Fraction of contaminated water not used for feed or drinking water	0	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total production of vegetables within 50 mi radius (kg per year)	$6.86 \times 10^7$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Production rate for irrigated vegetables (kg per year)	$6.71 \times 10^5$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total production of leafy vegetables within 50 mi radius (kg per year)	$1.80 \times 10^7$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Production rate for irrigated leafy vegetables (kg per year)	$1.76 \times 10^5$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total production of milk within 50 mi radius (liters per year)	$6.78 \times 10^7$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Production rate for irrigated milk (liters per year)	$6.63 \times 10^5$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Total production of meat within 50 mi radius (kg per year)	$9.15 \times 10^8$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
Production rate for irrigated meat (kg per year)	$8.96 \times 10^6$	Site-specific value from Table 5.4-1 of the ER (SCE&G 2010).
(a) Only radionuclides included in Regulatory Guide 1.109 are considered (NRC 1977).		

**Table G-2. Population by Sector and Radial Distance Around the VCSNS Site with Projections to the Year 2060**

Sectors	Year	Radial Distances (mi)											
		0-1	1-2	2-3	3-4	4-5	5-10	0-10 <sup>(a)</sup>	10-20	20-30	30-40	40-50	0-50
North	2000	0	0	0	0	7	237	244	602	4005	5172	17,385	27,408
	2010	0	0	0	0	7	254	261	643	4165	5657	21,191	31,917
	2020	0	0	0	0	8	268	276	679	4325	6203	25,690	37,173
	2030	0	0	0	0	8	287	295	726	4526	6879	31,223	43,649
	2040	0	0	0	0	9	306	315	773	4686	7626	37,963	51,363
	2050	0	0	0	0	10	325	335	820	4886	8533	46,085	60,659
	2060	0	0	0	0	10	346	356	873	5086	9609	56,103	72,027
North-Northeast	2000	0	0	0	7	50	336	393	446	7416	10,583	71,500	90,338
	2010	0	0	0	7	54	360	421	436	7726	11,147	85,629	105,359
	2020	0	0	0	8	57	380	445	472	8032	11,741	102,277	122,967
	2030	0	0	0	8	61	407	476	513	8416	12,481	122,730	144,616
	2040	0	0	0	9	65	433	507	553	8731	13,177	147,505	170,473
	2050	0	0	0	10	69	460	539	598	9115	14,034	177,331	201,617
	2060	0	0	0	10	73	491	574	651	9504	14,976	214,038	239,743
Northeast	2000	0	0	79	17	57	106	259	1411	2529	9318	37,953	51,470
	2010	0	0	85	18	61	113	277	1510	2673	9775	40,927	55,162
	2020	0	0	89	19	64	120	292	1594	2803	10,272	44,777	59,738
	2030	0	0	96	21	69	128	314	1707	2973	10,822	49,501	65,317
	2040	0	0	102	22	74	137	335	1820	3131	11,362	55,934	72,582
	2050	0	0	108	23	78	145	354	1933	3301	11,953	64,663	82,204
	2060	0	0	115	25	83	155	378	2060	3485	12,585	77,448	95,956
East-Northeast	2000	0	35	0	13	0	543	591	8373	982	1397	11,472	22,815
	2010	0	37	0	14	0	581	632	8959	1054	1547	12,517	24,709
	2020	0	40	0	15	0	614	669	9461	1120	1718	13,721	26,689
	2030	0	42	0	16	0	657	715	10,131	1204	1907	15,015	28,972
	2040	0	45	0	17	0	700	762	10,801	1290	2125	16,512	31,490
	2050	0	48	0	18	0	744	810	11,471	1378	2360	18,099	34,118
	2060	0	51	0	19	0	793	863	12,225	1,477	2,634	19,934	37,133

Table G-2. (contd)

		Radii/Distances (mi)											
		0	13	101	0	0	627	741	3159	5291	14,719	20,208	44,118
East	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2010	0	14	108	0	0	671	793	3382	5735	16,752	23,004	49,666
	2020	0	15	114	0	0	709	838	3576	6182	19,069	26,195	55,860
	2030	0	16	122	0	0	759	897	3832	6713	21,679	29,784	62,905
	2040	0	17	130	0	0	809	956	4088	7276	24,720	33,972	71,012
	2050	0	18	138	0	0	859	1015	4347	7877	28,047	38,553	79,839
	2060	0	19	147	0	0	915	1081	4637	8552	31,951	43,930	90,151
East-Southeast	2000	80	3	8	91	15	219	416	4102	60,471	10,288	6268	81,545
	2010	86	3	9	97	16	234	445	4453	66,161	11,440	6847	89,346
	2020	90	3	9	103	17	248	470	4859	73,060	12,798	7516	98,703
	2030	97	4	10	110	18	266	505	5283	80,059	14,247	8207	108,301
	2040	103	4	10	117	19	283	536	5739	87,761	15,889	8979	118,904
	2050	110	4	11	125	21	301	572	6259	96,672	17,736	9843	131,082
	2060	117	4	12	133	22	321	609	6820	106,337	19,823	10,765	144,354
Southeast	2000	0	20	39	0	107	256	422	28,191	187,392	34,059	8212	258,276
	2010	0	21	42	0	114	276	453	30,754	206,115	37,137	8950	283,409
	2020	0	23	44	0	121	295	483	33,869	228,958	40,898	9851	314,059
	2030	0	24	47	0	129	318	518	37,016	252,729	44,666	10,752	345,681
	2040	0	26	50	0	138	341	555	40,450	278,932	48,777	11,735	380,449
	2050	0	27	53	0	147	367	594	44,458	309,998	53,570	12,859	421,479
	2060	0	29	57	0	156	394	636	48,768	343,866	58,718	14,087	466,075
South-Southeast	2000	0	0	0	0	0	1886	1886	47,835	73,130	23,297	8921	155,069
	2010	0	0	0	0	0	2056	2056	55,280	87,025	27,103	9817	181,281
	2020	0	0	0	0	0	2263	2263	64,310	103,845	31,717	10,871	213,006
	2030	0	0	0	0	0	2470	2470	74,911	124,321	37,185	12,036	250,923
	2040	0	0	0	0	0	2696	2696	86,931	147,723	43,399	13,325	294,074
	2050	0	0	0	0	0	2960	2960	101,793	176,975	51,049	14,859	347,636
	2060	0	0	0	0	0	3242	3242	118,703	210,614	59,842	16,596	408,997
South	2000	0	4	0	73	60	1294	1431	12,382	19,982	10,399	7142	51,336
	2010	0	4	0	79	65	1479	1627	14,687	23,779	12,331	8,081	60,505
	2020	0	5	0	85	72	1703	1865	17,478	28,374	14,670	9,208	71,595
	2030	0	5	0	92	78	1962	2137	20,864	33,969	17,503	10,478	84,951
	2040	0	5	0	100	85	2254	2444	24,731	40,364	20,734	11,885	100,158
	2050	0	5	0	108	93	2613	2819	29,560	48,356	24,763	13,573	119,071

**Table G-2. (contd)**

		Radii/Distances (mi)														
		0	6	0	117	102	3020	3245	35,109	57,548	29,388	15,465	140,755			
South-Southwest	2060	0	0	0	8	29	61	1737	1835	7236	12,835	6375	35,130			
	2000	0	0	9	31	65	1971	2076	8391	14,912	7262	7808	40,449			
	2010	0	0	9	33	70	2251	2363	9778	17,390	8322	8969	46,822			
	2020	0	0	10	36	75	2577	2698	11,437	20,371	9537	10,268	54,311			
	2030	0	0	0	0	0	2470	2470	74,911	124,321	37,185	12,036	250,923			
	2040	0	0	11	38	81	2949	3079	13,332	23,782	10,900	11,703	62,796			
	2050	0	0	11	41	86	3396	3534	15,662	27,997	12,539	13,412	73,144			
Southwest	2060	0	0	12	44	92	3907	4055	18,332	32,814	14,385	15,326	84,912			
	2000	0	0	31	6	38	1044	1119	3577	3379	7498	12,580	28,153			
	2010	0	0	33	6	41	1117	1197	3822	3582	7968	14,290	30,859			
	2020	0	0	36	7	44	1201	1288	4097	3784	8441	16,121	33,731			
	2030	0	0	38	7	47	1284	1376	4372	3987	8921	18,309	36,965			
	2040	0	0	41	8	50	1378	1477	4682	4224	9477	20,625	40,485			
	2050	0	0	44	8	54	1472	1578	4993	4460	10,042	23,417	44,490			
West-Southwest	2060	0	0	47	9	57	1576	1689	5334	4697	10,615	26,568	48,903			
	2000	0	24	11	0	111	662	808	4151	2518	3479	5366	16,322			
	2010	0	26	12	0	119	708	865	4442	2677	3712	5861	17,557			
	2020	0	27	13	0	128	761	929	4774	2845	3947	6369	18,864			
	2030	0	29	14	0	137	814	994	5106	3013	4193	6949	20,255			
	2040	0	31	15	0	147	874	1067	5479	3206	4473	7588	21,813			
	2050	0	33	16	0	157	933	1139	5853	3399	4754	8270	23,415			
West	2060	0	36	17	0	168	1000	1221	6268	3601	5059	9065	25,214			
	2000	0	0	6	16	41	464	527	15,595	1658	4512	46,446	68,738			
	2010	0	0	6	17	44	496	563	16,687	1776	4973	50,918	74,917			
	2020	0	0	7	18	47	534	606	17,934	1911	5446	55,391	81,288			
	2030	0	0	7	20	50	571	648	19,182	2047	6008	60,706	88,591			
	2040	0	0	8	21	54	612	695	20,585	2199	6615	66,486	96,580			
	2050	0	0	8	23	58	654	743	21,989	2352	7250	72,455	104,789			
West-Northwest	2060	0	0	9	24	62	701	796	23,548	2522	7991	79,542	114,399			
	2000	0	12	0	4	36	573	625	1854	2942	17,480	23,226	46,127			
	2010	0	13	0	4	39	613	669	1984	3216	19,577	26,013	51,459			
	2020	0	14	0	5	41	659	719	2132	3505	21,675	28,800	56,831			
	2030	0	15	0	5	44	705	769	2280	3835	24,296	32,284	63,464			



**Table G-2. (contd)**

	Radii/Distances (mi)											
	0	16	0	5	48	756	825	2447	4195	27,093	36,000	70,560
2040	0	16	0	5	48	756	825	2447	4195	27,093	36,000	70,560
2050	0	17	0	6	51	808	882	2614	4568	30,065	39,948	78,077
2060	0	18	0	6	54	865	943	2800	4997	33,560	44,593	86,893
Northwest	0	0	0	6	0	423	429	495	3295	4127	11,816	20,162
2010	0	0	0	6	0	453	459	526	3500	4351	12,994	21,830
2020	0	0	0	7	0	486	493	561	3711	4578	14,268	23,611
2030	0	0	0	7	0	520	527	598	3962	4856	15,668	25,611
2040	0	0	0	8	0	558	566	637	4206	5111	17,247	27,767
2050	0	0	0	8	0	596	604	677	4476	5410	19,040	30,207
2060	0	0	0	9	0	639	648	721	4774	5727	20,941	32,811
North-Northwest	24	0	6	154	16	283	483	307	2212	18,657	9409	31,068
2010	26	0	6	165	17	303	517	326	2301	19,426	10,144	32,714
2020	27	0	7	174	18	321	547	344	2390	20,200	10,974	34,455
2030	29	0	7	186	19	343	584	365	2501	21,167	11,902	36,519
2040	31	0	8	199	21	366	625	387	2590	21,956	12,849	38,407
2050	33	0	8	211	22	389	663	409	2701	22,940	13,986	40,699
2060	35	0	9	225	23	415	707	434	2812	23,936	15,182	43,071
TOTAL	104	111	289	416	599	10,690	12,209	139,716	390,037	181,360	304,753	1,028,075
2010	112	118	310	444	642	11,685	13,311	156,323	436,397	200,158	344,991	1,151,180
2020	117	127	328	474	687	12,813	14,546	175,950	492,235	221,695	390,998	1,295,424
2030	126	135	351	508	735	14,068	15,923	198,349	554,626	246,347	445,812	1,461,057
2040	134	144	375	544	791	15,452	17,440	223,457	624,296	273,434	510,308	1,648,935
2050	143	152	397	581	846	17,022	19,141	253,449	708,511	305,045	586,393	1,872,539
2060	152	163	425	621	902	18,780	21,043	287,283	802,686	340,799	679,583	2,131,394

Source: SCE&G 2010, Table 2.5-1

(a) Transient populations are included in population estimates and projected within 0-10 mi only.

**Table G-3.** Comparison of Doses to the Public from Liquid Effluent Releases for a New Unit

Type of Dose	SCE&G ER (2010) <sup>(a)</sup>	Staff Calculation	Percent Difference
Total body (mrem/yr)	0.14 (adult)	0.14 (adult)	0
Organ dose (mrem/yr)	0.50 (adult GI tract)	0.50 (adult GI tract)	0
Thyroid (mrem/yr)	0.19 (child)	0.19 (child)	0
Population dose from liquid pathway (person-rem/yr)	14.6	14.6	0

(a) Results from SCE&G revised Tables 5.4-2 and 5.4-9 (SCE&G 2010).

## G.2 Dose Estimates to the Public from Gaseous Effluents

The staff used the dose-assessment approach specified in Regulatory Guide 1.109 (NRC 1977) and the GASPAR II computer code (Streng et al. 1987) to estimate doses to the MEI from the gaseous effluent pathway for both the proposed and existing units, and to the population within the 50-mi radius of the VCSNS site from the gaseous effluent pathway for proposed Units 2 and 3.

### G.2.1 Scope

The staff and SCE&G calculated the maximum gamma air dose, beta air dose, total body dose, and skin dose to receptors located at two points on the exclusion area boundary 0.5 mi from the VCSNS Units 2 and 3 powerblock area circle as shown in Figure 2.7-17 in the ER (SCE&G 2010). The maximum atmospheric dispersion factor occurs in the southeast direction, and the maximum ground deposition occurs in the east-northeast direction, so SCE&G used whichever dose value was higher in its analysis. Dose to the MEI was calculated at 1.68 mi southeast of the VCSNS site for the following exposure pathways: plume immersion, direct shine from deposited radionuclides, inhalation, ingestion of local farm or garden vegetables, and ingestion of locally produced beef and milk.

The staff reviewed the input parameters and values used by SCE&G (2010) for appropriateness, including references made to the AP1000 DCD (Westinghouse 2008). Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available. The staff concluded that the assumed exposure pathways, input parameters, and values used by SCE&G were appropriate. These pathways and parameters were used by the staff in its independent calculations using GASPAR II.

Joint frequency-distribution data of wind speed and wind direction by atmospheric-stability class for 2 years of meteorological data for the VCSNS site (SCE&G 2010) were used as input to the XOQDOQ code (Sagendorf et al. 1982) to calculate long-term average atmospheric dispersion factor ( $\chi/Q$ , where  $\chi$  is the concentration of the release and Q is the release rate) and

atmospheric deposition factor (D/Q) values for routine releases. The staff's independent results are the same as those reported by SCE&G in Tables 2.7-16 and 2.7-26 of the ER (SCE&G 2010).

Population doses were calculated for all types of releases (i.e., noble gases, iodines and particulates, and  $^3\text{H}$  and  $^{14}\text{C}$ ) using the GASPAR II code for the following exposure pathways: plume immersion, direct shine from deposited radionuclides, ingestion of vegetables, and ingestion of milk and meat.

### **G.2.2 Resources Used**

To calculate doses to the public from gaseous effluents, the staff used a PC version of the XOQDOQ and GASPAR II codes entitled NRCDOSE Version 2.3.8 (Chesapeake Nuclear Services, Inc. 2006) obtained through the Oak Ridge Radiation Safety Information Computational Center.

### **G.2.3 Input Parameters**

Table G-4 lists the major parameters used in calculating dose to the public from gaseous effluent releases during normal operation.

### **G.2.4 Comparison of Doses to the Public from Gaseous Effluent Releases**

Table G-5 compares results documented in the ER (SCE&G 2010) for doses from noble gases at the exclusion area boundary with the results calculated by the NRC staff. The doses calculated by the applicant and reported in draft EIS Table G-5 were from Revision 1 of the ER (SCE&G 2009a) and were based on only 1 year of meteorological data; the revised doses in Table G-5 are from Revision 2 of the ER and are based on 2 years of meteorological data. Based on Revision 2 of the ER, the doses provided by SCE&G and those calculated by NRC staff are the same; therefore, no comparison columns appear in Table G-5.

Table G-6 shows doses to the MEI calculated by SCE&G and the staff. Doses to the MEI were calculated for a child at the nearest residence, 1.68 mi southeast of the VCSNS site, because it provided the highest doses. The doses calculated by the applicant and reported in draft EIS Table G-6 were from Revision 1 of the ER (SCE&G 2009a) and were based on only 1 year of meteorological data; the revised doses in Table G-6 are from Revision 2 of the ER and are based on 2 years of meteorological data. Based on Revision 2 of the ER, the doses provided by SCE&G and those calculated by the NRC staff are the same; therefore, no comparison columns appear in Table G-6.

Appendix G

**Table G-4.** Parameters Used in Calculating Dose to Public from Gaseous Effluent Releases

Parameter	Staff Value	Comments	
New unit gaseous effluent source term (Ci/yr)	Ar-41	$3.4 \times 10^1$	Values from Westinghouse AP1000 Design Control Document Table 11.3-3 for a single unit (Westinghouse 2008). Except for rounding differences, these values are the same as those reported in ER Table 3.5-2 (SCE&G 2010).
	Kr-85m	$3.6 \times 10^1$	
	Kr-85	$4.093 \times 10^3$	
	Kr-87	$1.5 \times 10^1$	
	Kr-88	$4.6 \times 10^1$	
	Xe-131m	$1.776 \times 10^3$	
	Xe-133m	$8.7 \times 10^1$	
	Xe-133	$4.642 \times 10^3$	
	Xe-135m	$7.0 \times 10^0$	
	Xe-135	$3.34 \times 10^2$	
	Xe-138	$6.0 \times 10^0$	
	I-131	$1.168 \times 10^{-1}$	
	I-133	$4.017 \times 10^{-1}$	
	H-3	$3.5 \times 10^2$	
	C-14	$7.3 \times 10^0$	
	Cr-51	$6.06 \times 10^{-4}$	
	Mn-54	$4.331 \times 10^{-4}$	
	Co-57	$8.2 \times 10^{-6}$	
	Co-58	$2.316 \times 10^{-2}$	
	Co-60	$8.75 \times 10^{-3}$	
	Fe-59	$7.88 \times 10^{-5}$	
	Sr-89	$3.024 \times 10^{-3}$	
	Sr-90	$1.159 \times 10^{-3}$	
	Zr-95	$1.008 \times 10^{-3}$	
	Nb-95	$2.452 \times 10^{-3}$	
	Ru-103	$8.02 \times 10^{-5}$	
	Ru-106	$7.77 \times 10^{-5}$	
	Sb-125	$6.09 \times 10^{-5}$	
	Cs-134	$2.298 \times 10^{-3}$	
	Cs-136	$8.53 \times 10^{-5}$	
	Cs-137	$3.552 \times 10^{-3}$	
Ba-140	$4.23 \times 10^{-4}$		
Ce-141	$4.164 \times 10^{-4}$		

Table G-4. (contd)

Parameter	Staff Value	Comments	
Existing-unit gaseous effluent source term (Ci/yr)	Kr-85	$3.32 \times 10^{-1}$	Values are averages from annual radioactive-effluent-release reports for 2006, 2007, and 2008 Table 2 (SCE&G 2007, 2008, 2009d).
	Xe-133	$2.45 \times 10^0$	
	Xe-133m	$1.48 \times 10^{-3}$	
	Xe-135	$8.16 \times 10^{-1}$	
	Ar-41	$6.99 \times 10^{-2}$	
	I-131	$4.07 \times 10^{-5}$	
	I-132	$1.81 \times 10^{-4}$	
	I-133	$8.07 \times 10^{-7}$	
	Br-82	$4.20 \times 10^{-9}$	
	Mn-54	$1.76 \times 10^{-7}$	
	Co-58	$2.32 \times 10^{-7}$	
	Co-60	$4.43 \times 10^{-7}$	
	Sr-89	$9.97 \times 10^{-7}$	
	Be-7	$1.90 \times 10^{-5}$	
Population distribution	Table 2.5.1-1 of the ER (SCE&G 2010)	Population distribution used by SCE&G and the NRC staff is for year 2060.	
Wind speed and direction distribution	Tables 2.7-10 and 2.7-11 (SCE&G 2010)	Site-specific data provided by SCE&G for 2-year period from Jan. 1 2007 - Dec. 31 2008.	
Atmospheric dispersion factors ( $\text{sec}/\text{m}^3$ )	Tables 2.7-19 to 2.7-24 (SCE&G 2009e)	Site-specific data provided by SCE&G for 2-year period from Jan. 1 2007 - Dec. 31 2008.	
Ground deposition factors ( $\text{m}^{-2}$ )	Tables 2.7-25 and 2.7-26 (SCE&G 2010)	Site-specific data provided by SCE&G for 2-year period from Jan. 1 2007 - Dec. 31 2008.	
Milk production rate within an 50-mi radius of the VCSNS site (L/yr)	$6.78 \times 10^7$	Site-specific data provided by SCE&G (2010).	
Vegetable/fruit production rate within a 50-mi radius of the VCSNS site (kg/yr)	$6.8.66 \times 10^7$	Site-specific data provided by SCE&G (2010).	
Meat production rate within an 50-mi radius of the VCSNS site (kg/yr)	$9.15 \times 10^8$	Site-specific data provided by SCE&G (2010).	
Pathway receptor locations (direction, distance, and atmospheric dispersion factors) - nearest site boundary, vegetable garden, residence, meat animal	Table 5.4-5 and 2.7-16 of the ER (SCE&G 2010)	Site-specific data provided by SCE&G (2007).	

Appendix G

**Table G-4.** (contd)

<b>Parameter</b>	<b>Staff Value</b>	<b>Comments</b>
Consumption factors for milk, meat, leafy vegetables, and vegetables	Milk (L/yr)	Table 5.4-4 of the ER (SCE&G 2010) and Regulatory Guide 1.109 (NRC 1977).
	310 (adult)	
	400 (teen)	
	330 (child)	
	330 (infant)	
	Meat (kg/yr)	
	110 (adult)	
	65 (teen)	
	41 (child)	
	0 (infant)	
	Leafy vegetables (kg/yr)	
	64 (adult)	
	42 (teen)	
	26 (child)	
	0 (infant)	
Vegetables (kg/yr)		
520 (adult)		
630 (teen)		
520 (child)		
0 (infant)		
Fraction of year during which leafy vegetables are grown	0.58	Site-specific value from Table 5.4-4 of the ER (SCE&G 2010).
Fraction of year that milk cows are on pasture	1	Default value of GASPARD II code (Streng et al. 1987).
Fraction of MEI vegetable intake from own garden	0.76	Default value of GASPARD II code (Streng et al. 1987).
Fraction of milk-cow plant intake that is from pasture while on pasture	1	Default value of GASPARD II code (Streng et al. 1987).
Average absolute humidity over the growing season (g/m <sup>3</sup> )	8.0	Default value of GASPARD II code (Streng et al. 1987).
Average temperature over the growing season (F)	None	Default value of GASPARD II code (Streng et al. 1987).
Fraction of year beef cattle are on pasture	1	Default value of GASPARD II code (Streng et al. 1987).
Fraction of year beef cattle plant intake that is from pasture while on pasture	1	Default value of GASPARD II code (Streng et al. 1987).

**Table G-5.** Comparison of Doses to the Public from Noble-Gas Releases for a New Unit

Type of Dose	SCE&G ER (2010) <sup>(a)</sup>
Gamma air dose at exclusion area boundary – noble gases only (mrad/yr)	0.71
Beta air dose at exclusion area boundary – noble gases only (mrad/yr)	3.0
Total body dose at exclusion area boundary – noble gases only (mrem/yr)	0.58
Skin dose at exclusion area boundary – noble gases only (mrem/yr)	2.4

(a) Results from SCE&G ER Table 5.4-7 (SCE&G 2010)

**Table G-6.** Doses to the MEI from Gaseous Effluent Releases for a New Unit

Pathway	Age	Total Body Dose (mrem/yr)	Max Organ Dose (mrem/yr)	Skin Dose (mrem/yr)	Thyroid Dose (mrem/yr)
Plume (1.68 mi. SE)	All	0.058	0.0624 (lung)	0.314	0.0581
Ground (1.68 mi. SE)	All	0.058	0.0624 (lung)	0.314	0.0581
Inhalation (1.68 mi. SE)	Adult	0.0071	0.00913 (lung)	0.00693	0.0644
	Teen	0.0072	0.0103 (lung)	0.007	0.0803
	Child	0.0064	0.00893 (lung)	0.00618	0.0935
	Infant	0.0037	0.00546 (lung)	0.00355	0.0837
Vegetable (1.68 mi. SE)	Adult	0.054	0.276 (bone)	0.0461	0.643
	Teen	0.080	0.43 (bone)	0.071	0.864
	Child	0.17	0.995 (bone)	0.16	1.67
Meat (1.68 mi. SE)	Adult	0.016	0.0694 (bone)	0.0153	0.0385
	Teen	0.013	0.0585 (bone)	0.0125	0.0293
	Child	0.023	0.11 (bone)	0.0228	0.0482
Cow milk (1.68 mi. SE)	Adult	0.024	0.0834 (bone)	0.019	0.674
	Teen	0.038	0.152 (bone)	0.0327	1.07
	Child	0.082	0.37 (bone)	0.0757	2.13
	Infant	0.16	0.708 (bone)	0.153	5.16
Goat milk (1.68 mi. SE)	Adult	0.036	0.0964 (bone)	0.0234	0.893
	Teen	0.052	0.174 (bone)	0.0385	1.42
	Child	0.098	0.419 (bone)	0.0848	2.82
	Infant	0.18	0.778 (bone)	0.167	6.81

(a) The SCE&G values from Table 5.4-6 of SCE&G (2010) are based on 2 years of meteorological data. The MEI is a child living 1.68 mi southeast of the VCSNS site; values for adults, teenagers, and infants are shown for reference purposes.

### G.2.5 Comparison of Results – Population Doses

Table G-7 compares the SCE&G population dose estimates taken from Table 5.4-9 of the ER (SCE&G 2010) with the NRC staff estimates for the new units. Other than the projected annual dose from background radiation, the calculated doses are the same. SCE&G computed a collective dose to the population within a 50-mi radius projected for the year 2060 using an annual background dose of 0.36 rem, a number which includes both background and medical doses estimated in the early 1980s (NCRP 1987). The staff used an annual-dose value to U.S. residents of 0.311 rem (NCRP 2009), which includes background radiation but not medical radiation.

**Table G-7.** Comparison of Population Total Body Doses from Gaseous Effluent Releases for Two New Units

Pathway	SCE&G ER (2010) (person-rem/yr) <sup>(a)</sup>	Staff Estimate (person-rem/yr)	Percent Difference
Noble gases	2.3	2.3	0
Iodines and particulates	0.48	0.48	0
Tritium and <sup>14</sup> C	2.7	2.7	0
<b>Total</b>	5.5	5.5	0
Natural background	770,000 <sup>(b)</sup>	663,000	14

(a) Results from SCE&G ER Table 5.4-9 (SCE&G 2010). (b) Based on 0.36 rem/yr.

### G.3 Cumulative-Dose Estimates

Table G-8 compares SCE&G's results for estimates of cumulative dose to the MEI with those calculated by the NRC staff. Estimates of cumulative dose include doses from all pathways (i.e., external, liquid effluent, and gaseous effluent) for both the proposed Units 2 and 3 and the existing Unit 1 at the VCSNS site. Cumulative-dose estimates calculated by SCE&G (2010) were larger than those calculated by the NRC staff.

Staff estimates of the dose from releases from existing Unit 1 and proposed Units 2 and 3 are shown in Table G-8. The staff did not attempt to reproduce SCE&G's calculation of the dose from releases from Unit 1 to the MEI (located 1.68 mi southeast of the point halfway between the containment buildings of proposed Units 2 and 3). Instead, the staff examined gaseous effluent release data and dose calculations from the annual effluent and waste-disposal reports for Unit 1 from SCE&G for the years 2005 through 2008 (SCE&G 2006, 2007, 2008, 2009d). In these reports, SCE&G calculated the whole body and skin doses to an MEI at the Unit 1 site boundary from both gaseous and liquid effluents. The staff averaged SCE&G's whole body and skin doses over the years 2005–2008. The average total body dose is 0.0072 mrem/yr, far



below the SCE&G value of 1.2 mrem/yr from Unit 1 in Table 5.4-8 of the ER. Similarly, the dose to the maximally exposed organ (liver or gastrointestinal tract-lower large intestine [GI-LLI]) is 0.0171 mrem/yr, well below the SCE&G value of 0.043 mrem/yr in Table 5.4-8 of the ER. To address the thyroid dose, the staff calculated the average ratio of 4-year-average measured releases from Unit 1 to the design-basis releases from an AP1000 unit. The average ratio was 0.00049 (0.049 percent), with a maximum ratio of 0.0063 (0.63 percent) for  $^{133}\text{Xe}$ . This ratio for  $^{131}\text{I}$  was 0.0041 (0.41 percent). The staff concludes that thyroid doses to the MEI at the residence nearest to the VCSNS site (1.68 mi southeast) due to  $^{131}\text{I}$  released from Unit 1, which is farther away from the MEI than Units 2 and 3, would be 100 or more times smaller than the thyroid dose due to predicted releases of radioiodines from proposed Units 2 and 3.

**Table G-8.** Comparison of Cumulative Doses to the Maximally Exposed Individual

Dose	SCE&G ER (2009c) <sup>(a)(b)</sup>	Staff Estimate <sup>(c)</sup>	Percent Difference
Whole body (mrem/yr)	2.2	1.26	75
Thyroid dose (mrem/yr)	14	14.1	-1
Dose to other organ – bone (mrem/yr)	3.5	4.30	-19

(a) Doses from direct radiation were determined to be negligible (SCE&G 2010)  
 (b) Sum of doses from liquid and gaseous effluent releases for the existing Unit 1 and the proposed Units 2 and 3 are from Table 5.4-8 (SCE&G 2010).  
 (c) The staff calculation included the sum of doses from liquid and gaseous effluent releases from the existing unit and the two proposed units. Doses due to liquid effluent and gaseous effluents from the existing Unit 1 were taken from the 2005, 2006, 2007, and 2008 Annual Radiological Effluent Reports (SCE&G 2006, 2007, 2008, 2009d). Doses from radioiodines for the existing unit were negligible due to the small emissions of these gases.

## G.4 Dose Estimates to the Biota from Liquid and Gaseous Effluents

To estimate doses to the biota from the liquid and gaseous effluent pathways, the staff used the LADTAP II code (Streng et al. 1986), the GASPARI code (Streng et al. 1987), and input parameters supplied by SCE&G in its ER (SCE&G 2010).

### G.4.1 Scope

Doses to both terrestrial and aquatic biota were calculated using the LADTAP II code. Aquatic biota include fish, invertebrates, and algae. Terrestrial biota include muskrats, raccoons, herons, and ducks. The LADTAP II code calculates an internal-dose component and an external-dose component and sums them for a total body dose. The staff reviewed the input parameters used by SCE&G for appropriateness. Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available. The staff

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concluded that all of the input parameters used by SCE&G were appropriate. These parameters were used by the staff in its independent calculations using LADTAP II.

The LADTAP II code calculates biota dose only from the liquid effluent pathway. Terrestrial biota could also be exposed via the gaseous effluent pathway. These values would be the same as those for the MEI calculated using the GASPAR II code. SCE&G assumed that biota could be inside the exclusion area boundary, at a distance of 0.25 mi southeast of the powerblock area circle to estimate these doses (SCE&G 2010). To account for the closer proximity of the main body mass of animals to the ground compared to humans, the MEI calculation for the biota assumed a ground deposition factor twice that used in the MEI calculation for a member of the public. Also, no vegetation-intake pathway was estimated for muskrat and heron because they are not known to consume vegetation (SCE&G 2010).

### **G.4.2 Resources Used**

To calculate doses to the biota, the staff used a PC version of the LADTAP II and GASPAR II computer codes entitled NRCDOSE Version 2.3.8 (Chesapeake Nuclear Services, Inc. 2006). NRCDOSE was obtained through the Oak Ridge RSICC.

### **G.4.3 Input Parameters**

Most of the LADTAP II input parameters are specified in Section G.1.3 to include the source term, the discharge flow rate to the receiving fresh water system, and the shore-width factor. The values of these parameters are appropriate for use in calculating biota dose.

For GASPAR II input, SCE&G assumed that biota could be inside the exclusion area boundary, and assumed biota to be at an average distance of 0.25 mi from the powerblock area circle.

### **G.4.4 Comparison of Results**

Table G-9 compares SCE&G's biota dose estimates from liquid and gaseous effluents taken from Table 5.4-10 of the ER (SCE&G 2010) and additional information (SCE&G 2009c) with the NRC staff's estimates. Dose estimates were similar.

**Table G-9.** Comparison of Dose Estimates to Biota from Liquid and Gaseous Effluents for Two Units

Biota	Pathway	SCE&G (mrad/yr) <sup>(a)</sup>	Staff Calculation (mrad/yr) <sup>(a)</sup>	Percent Difference
Fish	Liquid	0.82	0.82	0.0
	Gaseous <sup>(b)</sup>	0	0	0
Invertebrate <sup>(c)</sup>	Liquid	2.3	2.30	0.0
	Gaseous <sup>(b)</sup>	0	0	0
Algae <sup>(c)</sup>	Liquid	6.7	6.66	0.6
	Gaseous <sup>(b)</sup>	0	0	0
Muskrat	Liquid	2.4	2.44	-1.7
	Gaseous	5	4.63	7.4
Raccoon	Liquid	0.96	0.956	0.4
	Gaseous	7.4	6.89	6.9
Heron	Liquid	11	11.14	-1.3
	Gaseous	5	4.63	7.4
Duck	Liquid	2.3	2.34	-1.7
	Gaseous	7.4	6.89	6.9

(a) For terrestrial biota, dose equals the sum of the plume immersion, vegetable ingestion (except herons and muskrats), inhalation, and two times the ground deposition doses 0.25 mi southeast of the site.

(b) Fish, invertebrates, and algae would not be exposed to gaseous effluents.

(c) From SCE&G (2009c)

## G.5 References

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## **Appendix H**

### **Authorizations, Permits, and Certifications**





## **Appendix H**

### **Authorizations, Permits, and Certifications**

This appendix contains a list of the environmental-related authorizations, permits, and certifications potentially required by Federal, State, regional, local, and affected Native American Tribal agencies related to the combined license for the proposed new nuclear units, at the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3. Tables H-1 through H-4 are based on Tables 1.2-1 through 1.2-4 of the Environmental Report submitted to the U.S. Nuclear Regulatory Commission by the South Carolina Electric and Gas (SCE&G 2010a, b).

**Table H-1. Authorizations Required for a Combined License**

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
FWS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	Concurrence with no adverse impact or consultation on appropriate mitigation measures	No permits have been issued.
SCDNR	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	Concurrence with no adverse impact or consultation on appropriate mitigation measures	No permits have been issued.
NMFS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (marine species)	Concurrence with no adverse impact or consultation on appropriate mitigation measures	No permits have been issued.
South Carolina Department of Archives and History	National Historic Preservation Act (36 CFR Part 800)	Consultation regarding potential to adversely affect historic resources	Confirm site construction or operation would not affect protected historic resources	No permits have been issued.
SCDHEC	Clean Water Act (33 USC 1251 et seq.), SC R.61-101 Water Quality Certification	Section 401 Certification (includes coastal zone consistency certification determination) <sup>(a)</sup>	Compliance with water quality standards	No permits have been issued.

**Table H-1. (contd)**

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
DOE	Nuclear Waste Policy Act (42 USC 10101 et seq.) and 10 CFR Part 961	Spent fuel contract	Contract for DOE disposal services for spent nuclear fuel	Unit 2 – DE-CR01-09RW09014 Unit 3 – DE-CR01-09RW09015
<p>Source: SCE&amp;G 2010a, Table 1.2-1</p> <p>(a) South Carolina R.61-101 states that "For Federal permits that require both a water-quality certification and a coastal zone consistency certification, the coastal zone consistency certification determination shall be issued as a component of, and concurrently with, the water-quality certification..."</p> <p>CFR = Code of Federal Regulations                      FWS = U.S. Fish and Wildlife Service                      NMFS = National Marine Fisheries Service                      SCDNR = South Carolina Department of Natural Resources                      DOE = U.S. Department of Energy</p>				

**Table H-2. Authorizations Required for Preconstruction Activities**

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
USACE	CWA (33 USC 1251 et seq.)	Section 404 Permit (requires Section 401 water-quality certification/coastal zone consistency certification determination)	Disturbance or crossing wetland areas or navigable waters	No permits have been issued.
DOT	49 FR 107, Subpart G	Certificate of Registration	Transportation of hazardous materials	No permits have been issued.

**Table H-2. (contd)**

<b>Agency</b>	<b>Authority</b>	<b>Requirement</b>	<b>Activity Covered</b>	<b>Permit Issued or Authorization Obtained/Status</b>
FWS	Migratory Bird Treaty Act (16 USC 703 et seq.), 50 CFR Part 21	Federal Depredation permit	Adverse impacts on protected species and/or their nests	Permit # MB040209-0. Expires March 31, 2011.
FAA	49 USC 1501, 14 CFR Part 77	Construction Notice	Notice of erection of structures (>200 feet high) potentially affecting air navigation	No permits have been issued.
FERC	Federal Power Act (16 USC 791a-825r) 18 CFR 4.200	License/order revision	Use of Monticello Reservoir as water source for Units 2 and 3 and discharge of blowdown to Parr Reservoir	Project 1894. Expires June 30, 2020.
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	Present and future public convenience and necessity require the operation of such equipment or facility	Approved March 2, 2009.

Table H-2. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
SCDNR	Nongame and Endangered Species and Conservation Act (SC Code of Laws, Title 50, Ch. 15), SC R.123-50	State Depredation permit	Adverse impacts on protected species and/or their nests	Permit # MD-15-10. Expires December 31, 2010.
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	Construction air emission sources (e.g., concrete batch plant, portable generators)	Permit # 1000-0036-CA. Expires August 24, 2011.
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	Operation of air emission sources	Permit # CM-1000-0012. Expires March 31, 2010. Renewal in process at SCDHEC.

Table H-2. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
SCDHEC	CWA (33 USC 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	Regulates limits of pollutants in liquid discharge to surface water	Permit # SC0030856. Expires July 31, 2012.
SCDHEC	CWA (33 USC 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 stormwater discharges associated with construction activity	Discharge of stormwater associated with large construction activities (>5 acres)	Permit # SCR100000. Expires August 31, 2011.
SCDHEC	CWA (33 USC 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-9	Stormwater Pollution Prevention Plan (SWPPP)	Discharge of stormwater associated with large construction activities (>5 acres)	Permit # SCR100000. Expires August 31, 2011.
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	Construct and operate a public, nontransient, noncommunity water system	Permit # 27383-WS. Expires June 1, 2013.

Table H-2. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
SCDHEC	Clean Water Act (33 USC 1251 et seq.), SC Pollution Control Act (SC Code of Laws, Title 48, Ch. 1), SC R.61-67	Wastewater facility construction permit	Construction of wastewater transportation and treatment facilities	Permit # 19311-IW. Expires September 10, 2012.
SCDHEC	SC R.61-71	Certification of monitoring well approval and/or abandonment	Abandonment (fill, plug, and seal) of test wells	Certification# 2624.
SCDOT	SC R.63-370 "Private Driveway entrances to Highways"	Permit for encroachment on state highway right-of-way	Construction of access road within the right-of-way of public roadways; improvements to Parr Road	Permit # 61919. Expires September 11, 2009.
Fairfield County	Local ordinance	Construction permit	Construction of facilities	Permit #s 12862, 12861, 12703, 12704, 12773.

**Table H-2. (contd)**

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
Source: SCE&G 2010a, b, Table 1.2-2	CAA = Clean Air Act			
CWA = Clean Water Act				
FAA = Federal Aviation Administration				
FERC = Federal Energy Regulatory Commission				
FWS = U.S. Fish and Wildlife Service				
PSC = Public Service Commission				
SCDHEC = South Carolina Department of Health and Environmental Control				
SCDOT = South Carolina Department of Transportation				
USACE = U.S. Army Corps of Engineers				



Table H-3. Authorizations Required for Construction Activities<sup>(a)</sup>

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
NRC	10 CFR Part 52, Subpart C	COL	Safety-related construction for a nuclear power facility.	No permits have been issued.
NRC	10 CFR 50.10(d)(1)	LWA	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.	No permits have been issued.
FAA	49 USC 1501, 14 CFR Part 77	Construction Notice	Notice of erection of structures (>200 ft high) potentially impacting air navigation.	No permits have been issued.
USACE	CWA	Section 404 Permit (requires Section 401 water-quality certification)	Disturbance or crossing wetland areas or navigable waters associated with transmission line corridors.	No permits have been issued.

Table H-3. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
FWS	Migratory Bird Treaty Act (16 USC 703 et seq.), 50 CFR Part 21	Federal Depredation Permit	Adverse impacts on protected species and/or their nests associated with transmission line corridors.	Permit # MB040209-0. Expires March 31, 2011.
SCDNR	Nongame and Endangered Species and Conservation Act, (SC Code of Laws, Title 50, Ch. 15), SC R.123-50	Depredation permit	Adverse impacts on state-designated protected species and/or their habitat associated with transmission line corridors.	Permit # MD-15-10. Expires December 31, 2010.
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	Construction air emission sources.	No permits have been issued.
SCDHEC	CWA (33 USC 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 stormwater discharges associated with construction activity	Discharge stormwater from linear construction sites (e.g., transmission lines) during construction.	Permit # SCR100000. Expires August 31, 2011.

Table H-3. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
Fairfield County	Local ordinance	Construction permit	Construction of facilities.	Permit #s 12862, 12861, 12703, 12704, 12773.
Various county offices responsible for land disturbing activities	Calhoun, Chester, Colleton, Dorchester, Fairfield, Hampton, Lancaster, Lexington, Newberry, Orangeburg, and Richland County ordinances	Land-Disturbing Activity Permit	Land-disturbing activities within county boundaries for transmission line corridors.	No permits have been issued.
SCDOT	23 CFR 1.23	Permit	Utility right-of-way easement.	No permits have been issued.

Sources: SCE&G 2010b, Table 1.2-3; MACTEC 2009; Pike 2010  
(a) Assumes that SCE&G obtained the authorizations that Table H-2 identifies.  
CAA = Clean Air Act  
CFR = Code of Federal Regulations  
COL = combined operating license  
CWA = Clean Water Act  
FAA = Federal Aviation Administration  
FWS = U.S. Fish and Wildlife Service  
LWA = Limited Work Authorization  
NPDES = National Pollutant Discharge Elimination System  
NRC = U.S. Nuclear Regulatory Commission  
SCDHEC = South Carolina Department of Health and Environmental Control  
SCDNR = South Carolina Department of Natural Resources  
SCDOT = South Carolina Department of Transportation  
USACE = U.S. Army Corps of Engineers

Table H-4. Authorizations Required for Operation<sup>(a)</sup>

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
NRC	10 CFR Part 70, 30, 40	Special nuclear materials license	Possession of byproduct, source or special nuclear materials.	No permits have been issued.
SCDHEC	CWA (33 USC 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	Regulates limits of pollutants in liquid discharge to surface water.	Permit # SC0030856. Expires July 31, 2012.
SCDHEC	Federal Clean Air Act (CAA), 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	Operation of air emission sources.	Permit # CM-1000-0012. Expires March 31, 2010. Renewal in process at SCDHEC.
SCDHEC	South Carolina Surface Water Withdrawal and Reporting Act (SC Code of Laws, Title 49, Ch. 4)	Registration and reporting of surface water withdrawal	Withdrawal of water from the Monticello Reservoir for cooling makeup and in-plant use.	No permits have been issued.

Table H-4. (contd)

Agency	Authority	Requirement	Activity Covered
SCDHEC	CWA (33 USC 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 stormwater discharges associated with industrial activity	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	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	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	Transportation of radioactive waste into the state of Tennessee.
			No permits have been issued.
			No permits have been issued.
			Permit # 0163-39-07. Expires December 31 of each year (renewable).
			Permit # T-SC001-L07. Expires December 31 of each year (renewable).

**Table H-4. (contd)**

Agency	Authority	Requirement	Activity Covered
Source: SCE&G 2010 b, Table 1.2-4			
(a) Assumes that SCE&G obtained the authorizations that Tables H-2 and H-3 identify.			
CFR = Code of Federal Regulations			
CWA = Clean Water Act			
NPDES = National Pollutant Discharge Elimination System			
NRC = U.S. Nuclear Regulatory Commission			
SCDHEC = South Carolina Department of Health and Environmental Control			
TDEC = Tennessee Department of Environment and Conservation			

## H.1 References

MACTEC Engineering and Consulting, Inc. (MACTEC). 2009. *V.C. Summer Nuclear Station, Units 2 and 3, Transmission Line Siting Study Santee Cooper—Revision #1*. Prepared for Santee Cooper, Moncks Corner, South Carolina. Accession No. ML102160577.

Pike Energy Solutions, LLC (Pike). 2010. *V.C. Summer Nuclear Station, Units 2 and 3, Transmission Line Siting Study Addendum Number 1*. Prepared for South Carolina Electric & Gas Company. Charlotte, North Carolina. Accession No. ML102980200.

South Carolina Electric and Gas (SCE&G). 2010a. *V.C. Summer Nuclear Station, Units 2 and 3 COL Application, Part 3, Applicant's Environmental Report – Combined License Stage, Revision 2*, Jenkinsville, South Carolina. Accession No. ML101930231.

South Carolina Electric and Gas (SCE&G). 2010b. Letter from R.B. Clary (SCE&G,) to U.S. Nuclear Regulatory Commission dated October 27, 2010 referencing R.B. Clary letter dated July 2, 2010, "Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) – Docket Numbers 52-027 and 52-028 – Voluntary Submittal for the Environmental Report to Update Figure 3.1-3 and Tables 1.2-1 through 1.2-4." NND-10-0384. Accession No. ML103010489.





## **Appendix I**

# **U.S. Army Corps of Engineers Public Interest Review Factors**



# Appendix I

## U.S. Army Corps of Engineers Public Interest Review Factors

A public interest review must be completed prior to any U.S. Army Corps of Engineers (USACE) permit decision for this project. The specific weight of each factor is determined by its importance and relevance to this proposed project. Some Public Interest Review Factors (PIRFs) may be given greater weight, while other PIRFs may not be present or as important based on their relevance. However, full consideration and appropriate weight will be given to all comments, including those of Federal, State, and local agencies, and other experts on matters within their expertise. A permit will generally be issued for Federal and Federally authorized activities; another Federal agency's determination to proceed is entitled to substantial consideration in the USACE's public interest review. Mitigation should be developed and incorporated within the public interest review process to the extent that the mitigation is found by the USACE to be reasonable and justified. However, only the measures required to confirm that the project is not contrary to the public interest may be required in this specific context.

### I.1 Wetlands

Most wetlands constitute a productive and valuable public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest. Wetlands considered to perform functions important to the public interest include the following:

- wetlands that serve significant natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species
- wetlands set aside for study of the aquatic environment or as sanctuaries or refuges
- wetlands, the destruction or alteration of which would negatively affect natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics
- wetlands that are significant in shielding other areas from wave action, erosion, or storm damage. Such wetlands are often associated with barrier beaches, islands, reefs and bars.
- wetlands that serve as valuable storage areas for storm and flood waters
- wetlands that are groundwater discharge areas that maintain minimum baseflows important to aquatic resources and those that are prime natural recharge areas

## Appendix I

- wetlands that serve significant water purification functions
- wetlands that are unique in nature or scarce in quantity to the region or local area.

### **I.2 Fish and Wildlife Values**

In accordance with the Fish and Wildlife Coordination Act, the USACE will consult with the Regional Director of the U.S. Fish and Wildlife Service, the Regional Director of the National Marine Fisheries Service, and the Director of the South Carolina Department of Natural Resources when considering how to conserve wildlife resources by preventing their direct and indirect loss and damage due to the proposed project. The USACE will give full consideration to the views of those agencies on fish and wildlife matters in deciding on the issuance, denial, or conditioning of individual or general permits.

### **I.3 Water Quality**

Project activities that may adversely affect the quality of waters of the United States will be evaluated for compliance with applicable effluent limitations and water-quality standards, during the construction and subsequent operation of the proposed activity, and will include the consideration of both point and non-point sources of pollution. It should be noted, however, that the Clean Water Act assigns responsibility for control of non-point sources of pollution to the State. Certification of compliance with applicable effluent limitations and water-quality standards required under provisions of Section 401 of the Clean Water Act will be considered conclusive with respect to water-quality considerations unless the Regional Administrator of the Environmental Protection Agency (EPA) advises that other water-quality aspects be taken into consideration.

### **I.4 Historic, Cultural, Scenic, and Recreational Values**

When applications for Department of the Army (DA) permits involve areas that possess recognized historic, cultural, scenic, conservation, recreational or similar values, full evaluation of the general public interest requires that due consideration be given to the effect that the proposed structure or activity may have on historic, cultural, scenic, and recreational values. Such values include those associated with wild and scenic rivers, historic properties and National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreation Areas, National Lakeshores, National Parks, National Monuments, estuarine and marine sanctuaries, archaeological resources, including Indian religious or cultural sites, and such other areas as may be established under Federal or State law for similar and related purposes. Recognition of these values is often reflected by State, regional, or local land-use classifications, or by similar Federal controls or policies. To the extent possible, action on permit applications should be consistent with and avoid significant adverse effects on the values or purposes for which the classifications, controls, or policies were established.

## **I.5 Consideration of Property Ownership**

Authorization of work or structures by the USACE does not convey a property right, nor authorize any injury to property or invasion of other rights. An inherent aspect of property ownership is a right to reasonable private use. However, this right is subject to the rights and interests of the public in the navigable and other waters of the United States, including the Federal navigation servitude and Federal regulation for environmental protection. Because a landowner has the general right to protect property from erosion, applications to erect protective structures will usually receive favorable consideration. However, if the protective structure may cause damage to the property of others, adversely affect public health and safety, adversely affect floodplain or wetland values, or otherwise appears contrary to the public interest, the USACE will advise the applicant and inform it of possible alternative methods of protecting his property.

## **I.6 Safety**

As a PIRF, safety is most closely reviewed in association with impoundment structures. To ascertain that all impoundment structures are designed for safety, non-Federal applicants may be required to demonstrate that the structures comply with established State dam safety criteria or have been designed by qualified persons and, in appropriate cases, that the design has been independently reviewed (and modified as the review would indicate) by similarly qualified persons.

## **I.7 Floodplains and Flood Hazards**

Floodplains possess significant natural values and carry out numerous functions important to the public interest. These include (1) water resources values (natural moderation of flooding, water quality maintenance, and groundwater recharge); (2) living resource values (fish, wildlife, and plant resources); (3) cultural resource values (open space, natural beauty, scientific study, outdoor education, and recreation); and (4) cultivated resource values (agriculture, aquaculture, and forestry). Although a particular alteration to a floodplain may constitute a minor change, the cumulative impact of such changes may result in a significant degradation of floodplain values and functions and in increased potential for harm to upstream and downstream activities. In accordance with the requirements of Executive Order 11988, the USACE, as part of its public interest review, should avoid to the extent practicable, long- and short-term significant adverse impacts associated with the occupancy and modification of floodplains, as well as the direct and indirect support of floodplain development whenever there is a practicable alternative. For those activities that in the public interest must occur in or impact upon floodplains, the USACE will verify, to the maximum extent practicable, that the impacts of potential flooding on human health, safety, and welfare are minimized, the risks of flood losses are minimized, and, whenever practicable, the natural and beneficial values served by floodplains are restored and

preserved. In accordance with Executive Order 11988, the USACE avoids authorizing floodplain developments whenever practicable alternatives exist outside the floodplain. If there are no such practicable alternatives, the USACE considers, as a means of mitigation, alternatives within the floodplain that will lessen any significant adverse impact on the floodplain.

## **I.8 Water Supply and Conservation**

Water is an essential resource, basic to human survival, economic growth, and the natural environment. Water conservation requires the efficient use of water resources in all actions that involve the significant use of water or that significantly affect the availability of water for alternative uses, including opportunities to reduce demand and improve efficiency to minimize new supply requirements. Actions affecting water quantities are subject to Congressional policy as stated in Section 101(g) of the Clean Water Act, which provides that the authority of States to allocate water quantities shall not be superseded, abrogated, or otherwise impaired.

## **I.9 Energy Conservation and Development**

Energy conservation and development are major national objectives. The USACE will give high priority to the processing of permit actions involving energy projects.

## **I.10 Navigation**

Section 11 of the Rivers and Harbors and Appropriations Act of 1899 authorized establishment of harbor lines shoreward of which no individual permits were required. Because harbor lines were established on the basis of navigation impacts only, the USACE published a regulation on May 27, 1970 (33 CFR 209.150), which declared that permits would thereafter be required for activities shoreward of the harbor lines. Review of applications is based on a full public interest evaluation, and harbor lines would serve as guidance for assessing navigation impacts. Accordingly, activities constructed shoreward of harbor lines prior to May 27, 1970, do not require specific authorization. Protection of navigation in all navigable waters of the United States continues to be a primary concern of the Federal government.

## **I.11 Economics**

When private enterprise applies for a permit, it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and is needed in the market place. However, in appropriate cases, the USACE may conduct an independent review of the need for the project from the perspective of the overall public interest. The economic benefits of many projects are important to the local community and contribute to needed improvements in the local economic base, affecting such factors as employment, tax revenues, community cohesion, community services, and property values. Many projects also

contribute to the national economic development (i.e., the increase in the net value of the national output of goods and services).

## **I.12 References**

33 CFR Part 209. Code of Federal Regulations. Title 33, *Navigation and Navigable Waters*, Part 209, "Administrative Procedure."

Clean Water Act. 33 USC 1251, et seq. (also referred to as the Federal Water Pollution Control Act [FWPCA]).

EO 11988. (1977). Executive Order. "Floodplain Management." *Federal Register* 42: 26951. (May 24, 1977).

Fish and Wildlife Coordination Act. 16 USC 661-667e, et seq.

Rivers and Harbors Appropriation Act of 1899, 33 USC 403, as amended (also referred to as the Rivers and Harbors Act of 1899).





## **Appendix J**

# **Carbon Dioxide Footprint Estimates for a 1000-MW(e) Reference Reactor**



## Appendix J

### Carbon Dioxide Footprint Estimates for a 1000-MW(e) Reference Reactor

The review team has estimated the carbon dioxide (CO<sub>2</sub>) footprint of various activities associated with nuclear power plants. These activities include building, operating, and decommissioning a plant. The estimates include direct emissions from the nuclear facility and indirect emissions from workforce transportation and the uranium fuel cycle.

Construction equipment estimates listed in Table J-1 are based on hours of equipment use estimated for a single nuclear power plant at a site requiring a moderate amount of terrain modification. Equipment usage for a multiple unit facility would be larger, but it is likely that it would not be a factor of 2 larger. A reasonable set of emissions factors used to convert the hours of equipment use to CO<sub>2</sub> emissions are based on carbon monoxide emissions (UniStar 2007) scaled to CO<sub>2</sub> using a scaling factor of 165 tons of CO<sub>2</sub> per ton of carbon monoxide (CO). This factor is based on emissions factors in Table 3.3-1 of AP-42 (EPA 1995). Equipment emissions estimates for decommissioning are one half of those for construction.

**Table J-1.** Construction Equipment CO<sub>2</sub> Emission (metric tons equivalent)

Equipment	Construction Total <sup>(a)</sup>	Decommissioning Total <sup>(b)</sup>
Earthwork and dewatering	$1.1 \times 10^4$	$5.4 \times 10^3$
Batch plant operations	$3.3 \times 10^3$	$1.6 \times 10^3$
Concrete	$4.0 \times 10^3$	$2.0 \times 10^3$
Lifting and rigging	$5.4 \times 10^3$	$2.7 \times 10^3$
Shop fabrication	$9.2 \times 10^2$	$4.6 \times 10^3$
Warehouse operations	$1.4 \times 10^3$	$6.8 \times 10^2$
Equipment maintenance	$9.6 \times 10^3$	$4.8 \times 10^3$
total <sup>(c)</sup>	$3.5 \times 10^4$	$1.8 \times 10^4$

(a) based on hours of equipment usage over 7-year period.

(b) based on equipment usage over 10-year period.

(c) total not equal to the sum due to rounding.

Workforce estimates are typical workforce numbers for new plant construction and operation based on estimates in various combined construction permit and operating license (COL) applications, and decommissioning workforce emissions estimates are based on decommissioning workforce estimates in NUREG-0586 S1, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1 Regarding the*

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*Decommissioning of Nuclear Power Reactors* (NRC 2002). A typical construction workforce averages about 2500 for a 7-year period with a peak workforce of about 4000. A typical operations workforce for the 40-year life of the plant is assumed to be about 400, and the decommissioning workforce during a decontamination and dismantling period of 10 years is assumed to be 200 to 400. In all cases, the daily commute is assumed to involve a 100-mi roundtrip with two individuals per vehicle. Considering shifts, holidays, and vacations, 1250 roundtrips per day are assumed each day of the year during construction; 200 roundtrips per day are assumed each day during operations; and 150 roundtrips per day are assumed 250 days per year for the decontamination and dismantling portion of decommissioning. If the SAFSTOR decommissioning option is included in decommissioning, 20 roundtrips each day of the year are assumed for the caretaker workforce.

Table J-2 lists the review team’s estimates of the carbon dioxide equivalent emissions associated with workforce transport. The table lists the assumptions used to estimate total miles traveled by each workforce and the factors used to convert total miles to metric tons CO<sub>2</sub> equivalent. CO<sub>2</sub> equivalent accounts for other greenhouse gases, such as methane and nitrous oxide, that are emitted by internal combustion engines. The workers are assumed to travel in gasoline powered passenger vehicles (cars, trucks, vans, and SUVs) that get an average of 19.7 miles per gallon of gas (FHWA 2006). Conversion from gallons of gasoline burned to CO<sub>2</sub> equivalent is based on Environmental Protection Agency (EPA) emissions factors (EPA 2007a, b).

**Table J-2.** Workforce CO<sub>2</sub> Footprint Estimates

	<b>Construction Workforce</b>	<b>Operational Workforce</b>	<b>Decommissioning Workforce</b>	<b>SAFSTOR Workforce</b>
Roundtrips per day	1250	200	150	20
Miles per roundtrip	100	100	100	100
Days per year	365	365	250	365
Years	7	40	10	40
Miles traveled	$3.2 \times 10^8$	$2.9 \times 10^8$	$3.8 \times 10^7$	$2.92 \times 10^7$
Miles per gallon <sup>(a)</sup>	19.7	19.7	19.7	19.7
Gallons fuel burned	$1.6 \times 10^7$	$1.5 \times 10^7$	$1.9 \times 10^6$	$1.58 \times 10^6$
Metric tons CO <sub>2</sub> per gallon <sup>(b)</sup>	$8.81 \times 10^{-3}$	$8.81 \times 10^{-3}$	$8.81 \times 10^{-3}$	$8.81 \times 10^{-3}$
Metric tons CO <sub>2</sub>	$1.4 \times 10^5$	$1.3 \times 10^5$	$1.7 \times 10^4$	$1.3 \times 10^4$
CO <sub>2</sub> equivalent factor <sup>(c)</sup>	0.971	0.971	0.971	0.971
Metric tons CO <sub>2</sub> equivalent	$1.5 \times 10^5$	$1.3 \times 10^5$	$1.7 \times 10^4$	$1.3 \times 10^4$
(a) FHWA 2006				
(b) EPA 2007b				
(c) EPA 2007a				

Published estimates of uranium fuel cycle CO<sub>2</sub> emissions required to support a nuclear power plant range from about 1 percent to about 5 percent of the CO<sub>2</sub> emissions from a comparably sized coal-fired plant, e.g., Sovacool (2008). A coal-fired power plant emits about 1 metric ton of CO<sub>2</sub> for each megawatt hour generated (Miller and Van Atten 2004). Therefore, for consistency with Table S-3 of Title 10 of the Code of Federal Regulations (CFR) 51.51 (10 CFR 51), the NRC staff has estimated the uranium fuel cycle CO<sub>2</sub> emissions as 0.05 metric tons of CO<sub>2</sub> per MWh generated. Finally, the review team estimated the CO<sub>2</sub> emissions directly related to plant operations from the typical usage of various diesel generators on site using EPA emissions factors (EPA 1995). The review team assumed an average of 600 hours of emergency diesel generator operation per year (total for four generators) and 200 hours of station blackout diesel generator operation (per year total for two generators).

Given the various sources of CO<sub>2</sub> emissions discussed above, the review team estimates the total life CO<sub>2</sub> footprint for a reference 1000 MW(e) nuclear power plant with an 80 percent capacity factor to be about 18 million metric tons. The components of the footprint are summarized in Table J-3. The uranium fuel cycle component of the footprint dominates all other components. It is directly related to power generated. As a result, it is reasonable to use reactor power to scale the footprint to larger reactors.

**Table J-3.** Nuclear Power Plant Lifetime Carbon Dioxide Footprint

Source	Activity Duration (yr)	Total Emissions (MT)
Construction equipment	7	$3.5 \times 10^4$
Construction workforce	7	$1.5 \times 10^5$
Plant operations	40	$1.9 \times 10^5$
Operations workforce	40	$1.3 \times 10^5$
Uranium fuel cycle	40	$1.7 \times 10^7$
Decommissioning equipment	10	$1.8 \times 10^4$
Decommissioning workforce	10	$1.7 \times 10^4$
SAFSTOR workforce	40	$1.3 \times 10^4$
Total		$1.8 \times 10^7$

In closing, the review team considers the footprint estimated in Table J-3 to be appropriately conservative. The CO<sub>2</sub> emissions estimates for the dominant component uranium fuel cycle are based on 30-year-old enrichment technology assuming that the energy required for enrichment is provided by coal-fired generation. Different assumptions related to the source of energy used for enrichment or the enrichment technology that would be just as reasonable could lead to a significantly reduced footprint.

Emissions estimates presented in the body of this environmental impact statement have been scaled to values that are appropriate for the proposed project. The uranium fuel cycle

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emissions have been scaled by reactor power using the scaling factor determined in Chapter 6 and by the number of reactors to be built. Plant operations emissions have been adjusted to represent the number of large CO<sub>2</sub> emissions sources (diesel generators, boilers, etc.) associated with the project. The workforce emissions estimates have been scaled to account for differences in workforce numbers and commuting distance. Finally, equipment emissions estimates have been scaled by estimated equipment usage. As can be seen in Table J-3, only the scaling of the uranium fuel cycle emissions estimates makes a significant difference in the total carbon footprint of the project.

### J.1 References

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

The Environmental Impact Statement (EIS) has been prepared to satisfy the requirements of the National Environmental Policy Act of 1969, as amended (NEPA). The EIS was prepared in response to an application submitted to the U.S. NRC by South Carolina Electric and Gas (SCE&G), acting for itself and for Santee Cooper (aka the South Carolina Public Service Authority) for combined construction permits and operating licenses (COLs). The proposed actions related to the SCE&G application are (1) NRC issuance of COLs for two new nuclear power reactor units (Units 2 and 3) at the V.C. Summer Nuclear Station (VCSNS) site in Fairfield County, SC, and (2) U.S. Army Corps of Engineers (USACE) permit action on a Department of the Army (DA) Individual Permit application to perform certain activities on the site. The USACE is participating with the NRC in preparing this EIS as a cooperating agency and participates collaboratively on the review team. This EIS includes the analysis by the NRC and USACE staff that considers and weighs the environmental impacts of building and operating two new nuclear units at the VCSNS site and at alternative sites, and mitigation measures available for reducing or avoiding adverse impacts. The EIS also addresses Federally listed species, cultural resources, and essential fish habitat issues.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

Environmental Impact Statement, EIS, National Environmental Policy Act of 1969, NEPA, U.S. NRC, South Carolina Electric and Gas, Santee Cooper, South Carolina Public Service Authority, combined construction permits and operating licenses, COLs, proposed actions, SCE&G, application, new nuclear power reactor units, Units 2 and 3, V.C. Summer Nuclear Station, VCSNS, Fairfield County, SC, U.S. Army Corps of Engineers, USACE, permit, Department of the Army, DA, Individual Permit application, participating, cooperating agency, review team, environmental impacts, building, operating, two new nuclear units, alternative sites, mitigation measures, reducing or avoiding adverse impacts, Federally listed species, cultural resources, fish habitat issues.

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