PUBLIC DISCLOSURE VERSION

Southern Nuclear Operating Company

Vogtle Early Site Permit Application

Part 3
Environmental Report

Revision 2

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*Does not meet NRC electronic filing criteria

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Acronyms and Abbreviations

AADT	Average Annual DailyTraffic
ABWR	Advanced Boiling Water Reactor
ACT	Alabama-Coosa-Tallapoosa
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AECL	Atomic Energy of Canada, Limited
AFUDC	Allowance for Funds Used During Construction
ALARA	as low as reasonably achievable
ANS	Academy of Natural Sciences of Philadelphia
APC	Alabama Power Company
AQCR	Air Quality Control Region
ARLH	Alabama Register of Landmarks and Heritage
Btu	British thermal unit
CDF	core damage frequency
CEDE	committed effective dose equivalent
CEQ	Council on Environmental Quality
cfs	cubic feet per second
Ci/MTU	curies per metric ton uranium
CO	carbon monoxide
COL	combined license

CVS	Chemical and Volume Control System
CWA	Clean Water Act
CWIS	Cooling Water Intake Structures
CWS	Circulating Water System
D&D	Decontamination and Dismantlement
DAW	Dry Active Waste Building
DB	dry-bulb
dB	decibels
DBT	design-base tornado
DCD	Design Control Document
DHR	Department of Human Resources
DNR	Department of Natural Resources
DOE	U.S. Department of Energy
DOT	Department of Transportation
DSM	demand-side management
EAB	Exclusion Area Boundary
EDE	effective dose equivalent
EIA	U. S. Energy Information Administration
EPA	Environmental Protection Agency
EPD	Environmental Protection Division
EPRI	Electric Power Research Institute
ER	environmental report
ESBWR	Economic Simplified Boiling Water Reactor
ESP	early site permit

FAA	Federal Aviation Administration
FES	Final Environmental Statement
FNP	Farley Nuclear Plant
FPR	Fiberglass-reinforced Plastic
fps	feet per second
FR	Federal Register
FRP	Facility Response Plan
GATT	General Agreement on Tariffs and Trade
GDNR	Georgia Department of Natural Resources
GDOT	Georgia Department of Transportation
GE	General Electric
GEIS	Generic Environmental Impact Statement
GEPD	Georgia Environmental Protection Division
GI-LLI	Gastrointestinal-lining of lower intestine
GIS	geographic information system
GPC	Georgia Power Company
gpd	gallons per day
gpm	gallons per minute
GPSC	Georgia Public Service Commission
GTC	Georgia Transmission Corporation
HLW	high level waste
HNP	Hatch Nuclear Plant
NRHP	National Register of Historical Places
HVAC	Heating, ventilation, air conditioning [system]

IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiation Protection
iDEN	[Motorola] integrated digital enhanced network
IGCC	Integrated Gasification Combined Cycle
IRP	integrated resource plan
ISFSI	Independent Spent Fuel Storage Installation
JFD	joint frequency distribution
kWh	kilowatt hour
lb	pound
LCD	local climatological data
LLW	Low-level radioactive waste
LPGS	Liquid Pathway Generic Study
LPZ	low population zone
LWA	limited work authorization
LWR	light water reactor
MAAP	Modular Accident Analysis Program
MCWB	mean coincident wet-bulb
MDCC	Meteorological Data Collection Center
MDCT	Mechanical Draft Wet Cooling Tower
MEAG	Municipal Electric Authority of Georgia
MEI	maximally exposed individual
MGD	million gallons per day
Mrem	millirem
msl	Mean Sea Level

MSW	municipal solid wastes
MTU	metric tons of uranium
MWe	megawatt
NAAQS	National Ambient Air Quality Standards
NAFTA	North American Fee Trade Agreement
NCDC	National Climatic Data Center
NDCT	Natural Draft Wet Cooling Tower
NEHS	National Institute of Environmental Health Sciences
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council, Inc.
NESC	National Electrical Safety Code
NMFS	National Marine Fisheries Services
NOAA	National Oceanic and Atmospheric Administration
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSPS	New Source Performance Standard
NSSS	Nuclear Steam Supply System
NWS	National Weather Service
OPC	Oglethorpe Power Corporation
PCS	Passive Containment Cooling System
PFBC	pressurized fluidized bed boiler
PM	particulate matter

PRA	probabilistic risk assessment
PVC	polyvinyl chloride
PT	participant test
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RCS	reactor coolant system
REMP	Radiological Environmental Monitoring Program
RIM	Rate impact measure
RTP	Rated Thermal Power
SAMA	severe accident mitigation alternatives
SCDHEC	South Carolina Department of Health and Environmental Control
SCE&G	South Carolina Electric and Gas
scfm	standard cubic feet per minute
SCR	selective catalytic reduction
SCT	societal cost test
SERC	Southeastern Electric Reliability Council, Inc.
SERCC	Southeast Regional Climate Center
SG	steam generators
SMZ	Streamside Management Zone
SNC	Southern Nuclear Operating Company
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SRP	Standard Review Plan
SRS	Savannah River Site

SSC	Structures, systems, and components
STEP	sales taxes for educational purposes
SWS	service water system
TCS	traffic count sections
TEDE	total effective dose equivalent
TLD	thermoluminescent dosimeter
TRC	total recordable cases
TRC	total resource cost
TRU	transuranic
TSC	Technical Support Center
UHS	ultimate heat sink
USACE	U.S. Army Corps of Engineers
USAR	updated safety analysis report
USCB	US Census Bureau
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UTM	Universal Transverse Mercator
VEGP	Vogtle Electric Generating Plant
WINGS	Wildlife Incentives for Non-Game and Game Species
WMA	Wildlife Management Area

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Chapter 1 Introduction

1.0 Introduction

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

1.1 Proposed Action

The proposed Federal action is issuance, under the provisions of 10 CFR Part 52, of an Early Site Permit (ESP) to SNC for the VEGP site for two additional nuclear units, both of which will be Westinghouse Electric Company, LLC (Westinghouse), AP1000, advanced light water reactors. In addition, SNC proposes a plan for redressing the environmental effects of certain site-preparation and preliminary construction activities, i.e., those activities allowed by 10 CFR 50.10(e)(1), performed by an ESP holder under 10 CFR 52.25. In accordance with the plan, the site would be redressed if the NRC issues the requested ESP (containing the site redress plan), the ESP holder performs these site-preparation and preliminary construction activities, the ESP is not referenced in an application for a construction permit or COL, and no alternative use is found for the site. While the ESP would not authorize construction and operation of any new nuclear units (other than those site-preparation and preliminary construction activities addressed herein), this ER analyzes the environmental impacts that could result from the construction and operation of one or two new nuclear units at the VEGP site or at one of the alternative sites. These impacts are analyzed to determine if the proposed ESP site is suitable for the addition of the new nuclear units and whether there is an alternative site that is obviously superior to the proposed site.

1.1.1 Purpose and Need

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

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

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

The ESP process addresses and resolves site safety, environmental protection, and emergency preparedness issues. As part of an ESP application, the applicant must prepare an environmental report that addresses the safety and environmental characteristics of the site.

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

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

In accordance with NRC regulations, SNC is submitting this ESP application in order to obtain the option of including new nuclear capability in the future generation mix for the owners and the state of Georgia.

The ESP also allows for a Limited Work Authorization (LWA) to perform certain activities such as backfill and initial concrete pours subject to redress, in advance of issuance of a COL.

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1.2 The Proposed Project

Section 1.2 provides a brief summary of project information that subsequent chapters and sections, particularly Chapter 3, *Plant Description*, describe in detail.

1.2.1 The Applicant and Owners

Georgia Power Company, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the City of Dalton, Georgia an incorporated municipality in the State of Georgia acting through its Board of Water, Light, and Sinking Fund Commissioners (Dalton Utilities) are the owners of the VEGP site and existing facilities. SNC has been authorized by GPC, acting as agent for the other owners (also known as co-owners) of the existing VEGP, to apply for an ESP for the VEGP site.

SNC is the plant licensee and operates VEGP Unit 1 and Unit 2 under contract with the owners. GPC and SNC are subsidiaries of Southern Company, and SNC is the licensed operator for all existing Southern Company nuclear generating facilities. SNC's business purpose is management and operation of nuclear generating facilities owned or co-owned by Southern Company subsidiaries. The SNC ESP application, Part 1, *Administrative Information*, Section 1.3 provides additional information about Southern Company, GPC, the VEGP co-owners and SNC.

1.2.2 Site Location

The VEGP site is located on the west bank of the Savannah River in eastern Burke County, in east-central Georgia. The site is approximately 100 miles northwest of Savannah, Georgia, and approximately 26 miles southeast of Augusta, Georgia, and across the river from the U.S. Department of Energy's Savannah River Site (Barnwell County, South Carolina). The proposed VEGP Units 3 and 4 footprint will be adjacent to and west of the existing VEGP Units 1 and 2. The original VEGP design was for a four unit plant. The new VEGP Units 3 and 4 will occupy generally the same area that was developed for the original VEGP Units 3 and 4 when the plant was first proposed for construction.

1.2.3 Reactor Information

SNC has selected the Westinghouse Electric Company, LLC (Westinghouse), AP1000 advanced light water reactor for construction and operation of two new units at the VEGP site. The NRC has approved the Design Control Document (DCD) for the AP1000. Previous ESP applications included the AP1000 technology, in addition to others, in their plant parameters envelopes. Unlike previous ESP applicants, SNC is not relying on a plant parameters envelope methodology to bound environmental impacts. The SNC application analyzes the environmental impacts of two AP1000 reactors at the VEGP site to be referred to as VEGP

Units 3 and 4 in this application. ER Section 3.2, *Reactor Power Conversion System*, provides additional information on the AP1000.

1.2.4 Cooling System Information

Each new unit will use a recirculating cooling water system that includes a natural draft cooling tower similar to the towers for Units 1 and 2. A new recessed shoreline intake structure will supply makeup water from the Savannah River to Units 3 and 4. A common line for Units 3 and 4 will be constructed to discharge cooling tower blowdown and other miscellaneous wastewater to the river. ER Section 3.4, *Cooling System*, provides additional detail.

1.2.5 Transmission System Information

The existing VEGP site is interconnected with the regional power grid via two 500 kV transmission lines and four 230 kV transmission lines. SNC has determined one new 500 kV transmission line will be added initially to handle the additional new generation capacity to the electric grid. SNC has performed a Macro-Corridor assessment for this proposed new 500 kV line to evaluate the NEPA aspects of line construction and operation. ER Section 3.7, *Power Transmission System*, provides additional detail.

1.2.6 Pre-application Public Involvement

The NRC held public outreach meetings in Waynesboro, Georgia, on May 10 and 11, 2006, to provide information to the public on the ESP review process, and to provide information on opportunities for public involvement in that process for the VEGP site. The meetings included a discussion of perspectives, roles, and responsibilities of the NRC with regard to VEGP. The May 10 meeting was held at the Burke County library. It utilized an informal open house format that allowed the public the opportunity to speak directly with NRC staff. On May 11, the NRC staff held a second public meeting at the Augusta Technical College Waynesboro Branch. The meeting began with another open house, followed by staff presentations on the regulatory framework for the ESP review process and a question-and-answer session. The staff also discussed opportunities for public involvement during the application review process.

1.2.7 Construction Start Date

The ESP does not constitute a decision or approval to build new units. SNC is pursuing the necessary steps to preserve the nuclear generation option. SNC has notified the NRC that they plan to submit a COL application in March of 2008 that could support a projected construction start date sometime in 2010. NRC regulations (10 CFR 50.10, *License Required*) provide for ESP holders to perform limited site preparation activities. SNC estimates that such site preparation activities will take 18 months to complete. SNC estimates that construction of

two AP1000 units will occur over about a 5-year period, beginning after NRC approval of an SNC COL application. ER Section 3.9, *Construction Activities*, provides additional detail.

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1.3 Status of Reviews, Approvals and Consultations

SNC has divided its discussion of the status of Federal, state, and local environmental protection licenses, permits, reviews, approvals, and consultations, collectively called authorizations, by activity. Tables 1.3-1 through 1.3-5 identify, for each activity, the following information:

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

The tables are structured on the assumption that authorizations for previously-initiated and ongoing activities were captured in the table representing the initiation of the work and, therefore, not repeated in subsequent tables. Except for ESP issuance, discussed below, SNC has not completed work to secure any other necessary authorizations and, therefore, the columns for permit numbers and expiration dates have been left blank. SNC will apply for and receive any required authorizations prior to initiating the activity. The following sections describe the activities to be authorized.

1.3.1 ESP Issuance

Table 1.3-1 lists ESP authorizations required prior to NRC issuance of an ESP. As shown, four authorizations are consultations that NRC must undertake in accordance with following statutes:

Endangered Species Act - The Endangered Species Act requires Federal agencies to ensure that agency action is not likely to jeopardize any species that is listed or proposed for listing as endangered or threatened. Depending on the action involved, the Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) regarding effects on non-marine species, the National Marine Fisheries Service (NMFS) for marine species, or both. Due to the presence of diadromous fish categorized as marine species in the Savannah River near the Vogtle site, the NRC must consult with both USFWS and NMFS. In addition, as a matter of policy, the NRC consults with states regarding state-protected species.

National Historic Preservation Act - The National Historic Preservation Act requires federal agencies having the authority to license any major federal action, prior to issuing the license, to take into account the effect of the undertaking on historic properties and to afford the Advisory Committee on Historic Preservation an opportunity to comment on the undertaking. Committee regulations provide for establishing an agreement with any State Historic Preservation Officer

(SHPO) to substitute state review for Committee review (35 CFR 800.7). The NRC will consult with both the Georgia SHPO and the South Carolina SHPO due to the site's location.

Federal Clean Water Act Section 401 requires for any activity that may result in a discharge into navigable waters, a certification from the state that the discharge will comply with applicable Clean Water Act requirements, including state Water Quality Standards. Certain construction-related activities conducted under the authority of the ESP will likely require a Construction Stormwater Permit issued by the Georgia Department of Natural Resources – Environmental Protection Division. This is a general permit and coverage is obtained by submitting a Notice of Intent (NOI) requesting coverage under the general permit. The State of Georgia provides a generic 401 certification for the general permit.

The Federal Coastal Zone Management Act imposes requirements on applicants for a federal license to conduct an activity that could affect a state's coastal zone. The Act requires the applicant to certify to the licensing agency that the proposed activity will be consistent with the state's federally approved coastal zone management program. The VEGP site is approximately 100 air miles and 150 river miles from the ocean. An existing VEGP transmission line traverses Georgia coastal counties. Construction of new reactors at the VEGP site will not result in any changes to this line. Due to the site's distance from the coast, small environmental effects, and lack of transmission line changes, SNC has concluded that the proposed action will not affect Georgia's coastal resources and that consistency certification requirements are not applicable.

1.3.2 Pre-Construction Activities

Pre-construction activities are those that NRC can authorize for undertaking prior to NRC issuance of a construction permit. A subset of these activities is limited to site preparation and construction of structures, systems, and components that are not nuclear-safety related. NRC approval of such activities can be obtained in either of two ways. First, if an ESP application includes a site redress plan, ESP issuance constitutes NRC authorization to conduct the activities. Second, rather than waiting for permit issuance, the ESP applicant can apply for authorization to perform these activities, commonly referred to as Limited Work Authorization 1, or LWA-1, early. The NRC would grant such authorization only after the presiding officer for the mandatory ESP hearing determines that NRC has satisfied NEPA requirements and that there is reasonable assurance that the proposed site and reactor are suitable from an environmental and radiological standpoint. This enables the applicant to start pre-construction before resolution of all safety issues and exhaustion of all appeals to construction permit issuance. SNC has included a site redress plan in this ESP application and is also preserving its option to seek a separate LWA-1 authorization. Table 1.3-2 lists authorization required for pre-construction activities.

The other subset of pre-construction activities is nuclear-safety-related and is commonly referred to as Limited Work Authorization 2, or LWA-2. The NRC would grant such

authorization only after, in addition to making the same determinations as for LWA-1, making a determination that there are no unresolved safety issues relating to the LWA-2 activities. SNC is preserving its option to seek an LWA-2 but has identified no required non-NRC authorizations not already included for LWA-1 or actual construction.

1.3.3 Site Redress Activities

Table 1.3-3 lists authorizations required prior to conducting site redress activities. "Redress activities" are activities that the licensee must perform to return the site to an environmentally stable and aesthetically acceptable state if LWA activities were undertaken but construction abandoned.

1.3.4 Construction Activities

Table 1.3-4 lists authorizations required prior to start of construction activities.

1.3.5 Operation

Table 1.3-5 lists authorizations required prior to start of operation.

Table 1.3-1 Authorizations Required for Early Site Permit

Agency	Authority	Requirement	License/ Permit No. (1)	Expiration Date (1)	Activity Covered
USFWS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	NA	NA	Concurrence with no adverse impact or consultation on appropriate mitigation measures.
NMFS	Endangered Species Act	Consultation regarding potential to adversely impact protected species (marine species)	NA	NA	Concurrence with no adverse impact or consultation on appropriate mitigation measures.
GDNR	National Historic Preservation Act, (36 CFR 800)	Consultation regarding potential to adversely affect historic resources	NA	NA	Confirm site construction or operation would not affect protected historic resources.
South Carolina Department of Archives and History	National Historic Preservation Act, (36 CFR 800)	Consultation regarding potential to adversely affect historic resources	NA	NA	Confirm site construction or operation would not affect protected historic resources.
GDNR	Federal Clean Water Act (FCWA) (33 U.S.C. 1251 et seq.)	Section 401 Certification			Compliance with water quality standards.

USFWS - U.S. Fish and Wildlife Service

NMFS - National Marine Fisheries Service

GDNR - Georgia Department of Natural Resources

[1] No permits have been issued.

Table 1.3-2 Authorizations Required for Pre-Construction Activities

Agency	Authority	Requirement	License/ Permit No. (1)	Expiration Date (1)	Activity Covered
NRC	10 CFR 52.25 or 10 CFR 50.10(e)(1)	Early Site Permit with Site Redress Plan or Limited Work Authorization			Non-nuclear construction, including site preparation.
USACE	Clean Water Act (CWA)	Section 404 Permit			Disturbance or crossing wetland areas or navigable waters. For site and rail corridor upgrade.
USACE	33 CFR 323	Dredge and Fill Discharge Permit			Construction/ modification of intake/ discharge to Savannah River. For site and rail corridor upgrade[2].
USACE	Rivers and Harbors Act	Section 10 Permit			Barge slip modification impacts to navigable waters of the U.S.
USDOT	49 CFR 107, Subpart G	Certificate of Registration			Transportation of hazardous materials.
USFWS	Migratory Bird Treaty Act, 50 CFR 21	Federal Depredation Permit			Adverse impacts on protected species and/or their nests. For site and rail corridor upgrade.
FAA	49 USC 1501 14 CFR 77	Construction Notice			Notice of erection of structures (>200 feet high) potentially impacting air navigation.
GPSC	GA Public Utilities Act (O.C.G.A. Section 46-3-1 et seq.), GA Rules and Regulations 515-3-4-.07	Certificate of Public Convenience and Necessity			Present and future public convenience and necessity require the operation of such equipment or facility.

Table 1.3-2 (cont.) Authorizations Required for Pre-Construction Activities

Agency	Authority	Requirement	License/ Permit No. (1)	Expiration Date (1)	Activity Covered
GDNR	GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391-4-10	Depredation Permit			Adverse impacts on state designated protected species and/or their habitat. For site and rail corridor.
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Part 70 Air Quality Construction Permit			Construction air emission sources.
GDNR	FCWA, GA Water Quality Control Act	Revision of existing National Pollutant Discharge Elimination System Permit			Regulates limits of pollutants in liquid discharge to surface water.
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Developments	GAR100003	July 31, 2008	Discharge storm water from site during construction.
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR100002	July 31, 2008	Discharge storm water from linear construction sites (e.g., roadways and rail corridor).
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	Revision of existing permit to operate a public water system			Operate a public, non-transient, non-community water system.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA	Revision of existing permit to operate a			Operate a public, transient, non-community water system.

Table 1.3-2 (cont.) Authorizations Required for Pre-Construction Activities

Agency	Authority	Requirement	License/ Permit No. (1)	Expiration Date (1)	Activity Covered
	Rules and Regulations 391-3-5	public water system			
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03	Modification of Existing Permit to Use Groundwater			Consumptive use of 100,000 gallons per day or more of groundwater.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.09	Permit to Withdraw Groundwater			Dewater for foundation if needed for more than 60 days.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.14	Certification of Abandoned Wells			Abandoned wells have been filled, plugged and sealed.
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7	Land Disturbing Activity Permit			Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor upgrade.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4-.06	Permit by Rule - Inert Landfill Permit			On-site disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Private Industry Landfill Permit			On-site disposal of solid waste consisting of construction and demolition debris.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.

Table 1.3-2 (cont.) Authorizations Required for Pre-Construction Activities

Agency	Authority	Requirement	License/ Permit No. (1)	Expiration Date (1)	Activity Covered
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Revision of existing Title V Operating Permit			Operation of air emission sources.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-336	Building Permit			Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County.

NRC - U.S. Nuclear Regulatory Commission

USACE - U.S. Army Corps of Engineers

USDOT - U.S. Department of Transportation

FAA - Federal Aviation Administration

GPSC - Georgia Public Service Commission

[1] No permits have been issued.

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

Table 1.3-3 Authorizations Required for Redress Activities

Agency	Authority	Requirement	License/Permit No. (1)	Expiration Date (1)	Activity Covered
USACE	Clean Water Act (CWA)	Section 404 Permit			Disturbance or crossing wetland areas or navigable waters.
USACE	33 CFR 323	Dredge and Fill Discharge Permit			Construction / modification of intake / discharge to Savannah River.
USACE	Rivers and Harbors Act	Section 10 Permit			Impacts to navigable waters of the U.S. Barge Slip Modification.
USDOT	49 FR 107, Subpart G	Certificate of Registration			Transportation of hazardous materials.
GDNR	Federal Clean Water Act (FCWA) (33 U.S.C. 1251 et seq.)	Section 401 Certification			Compliance with water quality standards.
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Developments	GAR100003	July 31, 2008	Discharge storm water from site during construction (might be covered by existing registration).
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR100002	July 31, 2008	Discharge storm water linear construction sites (e.g., roadways, transmission lines) during construction)(might be covered by existing registration).

Table 1.3-3 (cont.) Authorizations Required for Redress Activities

Agency	Authority	Requirement	License/Permit No. (1)	Expiration Date (1)	Activity Covered
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7	Land Disturbing Activity Permit			Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor.
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Part 70 Air Quality Construction Permit			Construction air emission sources.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	Notice of Termination (NOT) -Permit to operate a Public Water System			Operate a public, non-transient, non-community water system.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	NOT - Permit to operate a Public Water System			Operate a public, transient, non-community water system.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03	NOT - Permit to Use Groundwater			Consumptive use of 100,000 gallons per day or more of groundwater.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.09	Permit to Withdraw Groundwater			Dewater for foundation if needed for more than 60 days.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.14	Certification of Abandoned Wells			Abandoned wells have been filled, plugged and sealed.

Table 1.3-3 (cont.) Authorizations Required for Redress Activities

Agency	Authority	Requirement	License/Permit No. (1)	Expiration Date (1)	Activity Covered
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4-.06	Permit by Rule - Inert Landfill Permit			On-site disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Private Industry Landfill Permit			On-site disposal of solid waste consisting of construction and demolition debris.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-336	Building Permit			Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County.

[1] No permits have been issued.

Table 1.3-4 Authorizations Required for Construction Activities[1]

Agency	Authority	Requirement	License/ Permit No. (2)	Expiration Date (2)	Activity Covered
NRC	10 CFR 52, Subpart C or 10 CFR 50.10(e)(3)	Combined Operating License or Limited Work Authorization 2			Safety-related construction for a nuclear power facility.
FAA	49 USC 1501 14 CFR 77	Construction Notice			Notice of erection or structures (>200 feet high) potentially impacting air navigation.
USACE	Clean Water Act (CWA)	Section 404 Permit			Disturbance or crossing wetland areas or navigable waters. For transmission line corridor.
USACE	33 CFR 323	Dredge and Fill Discharge Permit			Construction/ modification of intake/ discharge to Savannah River. For transmission line corridor.
USFWS	Migratory Bird Treaty Act, 50 CFR 21	Federal Depredation Permit			Adverse impacts on protected species and/or their nests. For site transmission line corridor.
GDNR	GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391-4-10	Depredation permit			Adverse impacts on state designated protected species and/or their habitat. For transmission line corridor.
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Part 70 Air Quality Construction Permit			Construction air emission sources.

Table 1.3-4 (cont.) Authorizations Required for Construction Activities[1]

Agency	Authority	Requirement	License/ Permit No. (2)	Expiration Date (2)	Activity Covered
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR100002	July 31, 2008	Discharge storm water linear construction sites (e.g., roadways, transmission lines) during construction.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7	Land Disturbing Activity Permit			Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For transmission line corridor.
GDNR	FCWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR100002	July 31, 2008	Discharge storm water linear construction sites. For transmission line corridor.

Table 1.3-4 (cont.) Authorizations Required for Construction Activities[1]

Agency	Authority	Requirement	License/ Permit No. (2)	Expiration Date (2)	Activity Covered
GDOT	23 CFR 1.23	Permit			Utility right-of-way easement.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County.
Various county offices responsible for land disturbing activities	Jefferson, Warren, and McDuffie County Ordinances	Land Disturbing Activity Permit.			Land disturbing activities within county boundaries. For transmission line corridor.

GDOT – Georgia Department of Transportation

1 Assumes that SNC obtained the authorizations that Table 1.3-2 identifies.

2 No permits have been issued.

Table 1.3-5 Authorizations Required for Operation[1]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
GDNR	FCWA, GA Water Quality Control Act	Revision of existing National Pollutant Discharge Elimination System Permit			Regulates limits of pollutants in liquid discharge to surface water.
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Revision of existing Title V Operating Permit			Operation of air emission sources.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03	Revision of existing Permit to Use Groundwater			Consumptive use of 100,000 gallons per day or more of groundwater.
GDNR	GA Water Quality Control Act (O.C.G.A. 12-5-31 et seq.), GA Rules and Regulations 391-3-6	Revision of existing Surface Water Withdrawal Permit to Withdraw, Divert or Impound Surface Water			Withdraw water from the Savannah River for cooling makeup and in-plant use.
South Carolina Department of Health and Environmental Control – Division of Waste Management	South Carolina Radioactive Waste Transportation and Disposal Act (Act No. 429)	Revision of existing South Carolina Radioactive Waste Transport Permit			Transportation of radioactive waste into the State of South Carolina.

Table 1.3-5 (cont.) Authorizations Required for Operation[1]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered
State of Tennessee Department of Environment and Conservation Division of Radiological Health	Tennessee Department of Environment and Conservation Rule 1200-2-10.32	Revision of existing Tennessee Radioactive Waste License-for-Delivery			Transportation of radioactive waste into the State of Tennessee.
State of Utah Department of Environmental Quality Division of Radiation Control	R313-26 of the Utah Radiation Control Rules	Revision of existing General Site Access Permit			Transportation of radioactive materials into the State of Utah.
GPSC	GA Radiation Control Act (O.C.G.A. 31-13-1 et seq.), GA Rules and Regulations 391-3-17-.06	Revision of existing General Permit – Transportation of Radioactive Materials			Transportation of radioactive materials in the State of Georgia.

[1] Assumes that SNC obtained the authorizations that Tables 1.3-2 and 1.3-4 identify.

1.4 Methodology

NRC regulation 10 CFR 52.17(a)(2) specifies the contents of an Environmental Report (ER) for an ESP application and Regulatory Guide 4.2, *Preparation of Environmental Reports for Nuclear Power Stations, Revision 2,* July 1976 (RG 4.2) provides guidance to applicants preparing environmental reports for nuclear power stations. The NRC's *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Revision 0,* 1999 (NUREG-1555), provides guidance for NRC staff to use when conducting environmental reviews of applications related to nuclear power plants. Because RG 4.2 is an earlier NRC document (1976) and NUREG-1555 is relatively new (1999), SNC chose to look to the latter for guidance in establishing the format and content of its environmental report. SNC has provided additional information and organization in the material presented as seemed appropriate when applying lessons learned from the first three ESP applicants. SNC prepared Table 1.4-1 to verify conformance with regulatory requirements. The table identifies each requirement and indicates where in the ER SNC has responded to the requirement.

SNC also evaluated the conclusions of NRC's *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, Revision 0, 1996 (NUREG-1437), for input in assessing the impacts of the new nuclear units on the VEGP site. SNC concluded that if characteristics of the proposed reactors are similar to those of the existing fleet, then NUREG-1437 significance determination criteria could be applied in the ESP environmental review. SNC has indicated in its ER where it has used NUREG-1437 in assessing VEGP environmental impacts.

Table 1.4-1 Environmental Report Responses to Early Site Permit Regulatory Requirements

No.	Regulatory Requirement (10 CFR)[1]	Responsive Environmental Report Section
1.	51.45(a), Signed original	Transmittal letter
2.	51.45(b), Description of proposed action	Chapter 3, *Plant Description*
3.	51.45(b), Statement of purpose of proposed action	Section 1.1.1, *Purpose and Need*
4.	51.45(b), Description of environment affected by proposed action	Chapter 2, *Environmental Description*
5.	51.45(b)(1), Environmental impact of proposed action	Chapters 4, *Environmental Impacts of Construction*; 5, *Environmental Impacts of Station Operation*; 7, *Environmental Impact of Postulated Accidents Involving Radioactive Materials*, and 10, *Environmental Consequences of the Proposed Action*
6.	51.45(b)(2), Unavoidable adverse impacts	Section 10.1, *Unavoidable Adverse Environmental Impacts*
7.	51.45(b)(3), Alternatives to proposed action	Chapter 9, *Alternatives to the Proposed Action*
8.	51.45(b)(4), Relationship between short-term use and long-term productivity	Section 10.3, *Relationship Between Short-Term Uses and Long-Term Productivity of the Human Environment*
9.	51.45(b)(5), Irreversible and irretrievable commitments of resources	Section 10.2, *Irreversible and Irretrievable Commitments of Resources*
10.	51.45(c), Comparison of environmental effects of proposed action and alternatives	Chapters 4, *Environmental Impacts of Construction*; 5, *Environmental Impacts of Station Operation*; 7, *Environmental Impact of Postulated Accidents Involving Radioactive Materials*, 10, *Environmental Consequences of the Proposed Action* and 9, *Alternatives to the Proposed Action*
11.	51.45(c), Alternatives for reducing or avoiding adverse environmental impacts	Sections 4.6 *Measures and Controls to Limit Adverse Impacts During Construction* and 5.10, *Measures and Controls to Limit Adverse Impacts During Operations*
12.	51.45(c), Economic, technical, and other benefits and costs of proposed action and alternatives	Section 10.4, *Benefit-Cost Balance*
13.	51.45(d), Federal permits and other entitlements and status of compliance	Section 1.3, *Status of Reviews, Approvals, and Consultations*
14.	51.45(d), Compliance with Federal and other environmental quality standards and requirements	Section 1.3, *Status of Reviews, Approvals, and Consultations*
15.	51.45(d), Compliance for alternatives	Section 9.2 *Energy Alternatives* and Section 9.3 *Alternative Sites*
16.	51.45(e), Adverse information	Section 10.1, *Unavoidable Adverse Environmental Impacts*
17.	51.50 and 51.51(a), Uranium fuel cycle	Section 5.7, *Uranium Fuel Cycle Impacts*

Table 1.4-1 (cont.) Environmental Report Responses to Early Site Permit Regulatory Requirements

No.	Regulatory Requirement (10 CFR)[1]	Responsive Environmental Report Section
18.	51.50 and 51.52, Fuel and waste transportation	Sections 3.8, *Transportation of Radioactive Materials*, 511, *Transportation of Radioactive Materials*, and 7.4, *Transportation Accidents*
19.	51.50, Reporting and record keeping procedures	Chapter 6, *Environmental Measurements and Monitoring Programs*
20.	51.50, Conditions and monitoring	Chapter 6, *Environmental Measurements and Monitoring Programs*

[1] Incorporated by reference at 10 CFR 52.17(a)(2)

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Chapter 2 Environmental Description

Chapter 2 describes the existing environmental conditions at the Vogtle Electric Generating Plant (VEGP) site, the site vicinity and the region. The environmental descriptions provide sufficient detail to identify those environmental resources that have the potential to be affected by the construction, operation, or decommissioning of the new units. The chapter is divided into nine sections:

- Site Location (Section 2.1)
- Land (Section 2.2)
- Water (Section 2.3)
- Ecology (Section 2.4)
- Socioeconomics (Section 2.5)
- Geology (Section 2.6)
- Meteorology, Air Quality, and Noise (Section 2.7)
- Related Federal and Other Project Activities (Section 2.8)
- Existing Plant Site Characteristics, Design Parameters, and Site Interface Values (Section 2.9)

The following descriptions should help the reader understand the scope of the discussion:

- VEGP site – the 3,169 acre site as described in the Unit 1 and Unit 2 licenses
- New plant (VEGP Units 3 and 4) footprint – the approximately 500 acres within the VEGP site that will encompass the construction and operation of the new nuclear units
- Vicinity – the area within approximately the 6- or 10-mile (depending on the issue) radius around the VEGP site
- Region – the area within approximately the 50-mile radius around the VEGP site

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2.1 Site Location

SNC proposes to construct and operate two Westinghouse AP1000 reactors at VEGP in Burke County, Georgia. The two AP1000 reactors will be referred to as VEGP Units 3 and 4.

The proposed early site permit (ESP) is for the existing 3,169-acre VEGP site. VEGP Units 3 and 4 and supporting infrastructure will be sited in the area delineated in Figure 2.1-1. The centerline of VEGP Units 3 and 4 will be approximately 2,100 feet west and 400 feet south of the center of the existing Unit 2 containment building. Unit 4 containment will be approximately 800 feet west of Unit 3 containment.

The coordinates of the center of the containment buildings for VEGP Units 3 and 4 are given below in State Plane and Universal Transverse Mercator (UTM) coordinates:

Unit		Georgia East Coordinates (NAD27)	UTM (NAD83)
3	N	1,142,600	3,667,166.728
	E	621,800	428,315.413
4	N	1,142,600	3,667,169.439
	E	621,000	428,071.651

The 3,169-acre VEGP site is located on a Coastal Plain bluff on the southwest side of the Savannah River in eastern Burke County. The site and its exclusion area boundary (EAB) are generally bounded by River Road, Hancock Landing Road, and approximately 1.7 miles of the Savannah River (River Miles 150.0 to 151.7). The site is approximately 30 river miles above the U.S. 301 highway bridge and directly across the river from the Department of Energy's Savannah River Site (Barnwell County, South Carolina). The site is approximately 15 miles east north east of Waynesboro, Georgia and 26 miles southeast of Augusta, Georgia, the nearest population center (i.e., having more than 25,000 residents) (Figure 2.1-2). It is also about 136 miles from Savannah, Georgia and 150 river miles from the mouth of the Savannah River.

Access to the site is from River Road via U.S. Route 25, and Georgia Routes 56, 80, 24 or 23 (Figure 2.1-3). Barge access is available from the Savannah River which is navigable to a point upstream of VEGP. A railroad spur runs to the site from the Norfolk Southern Savannah-to-Augusta track.

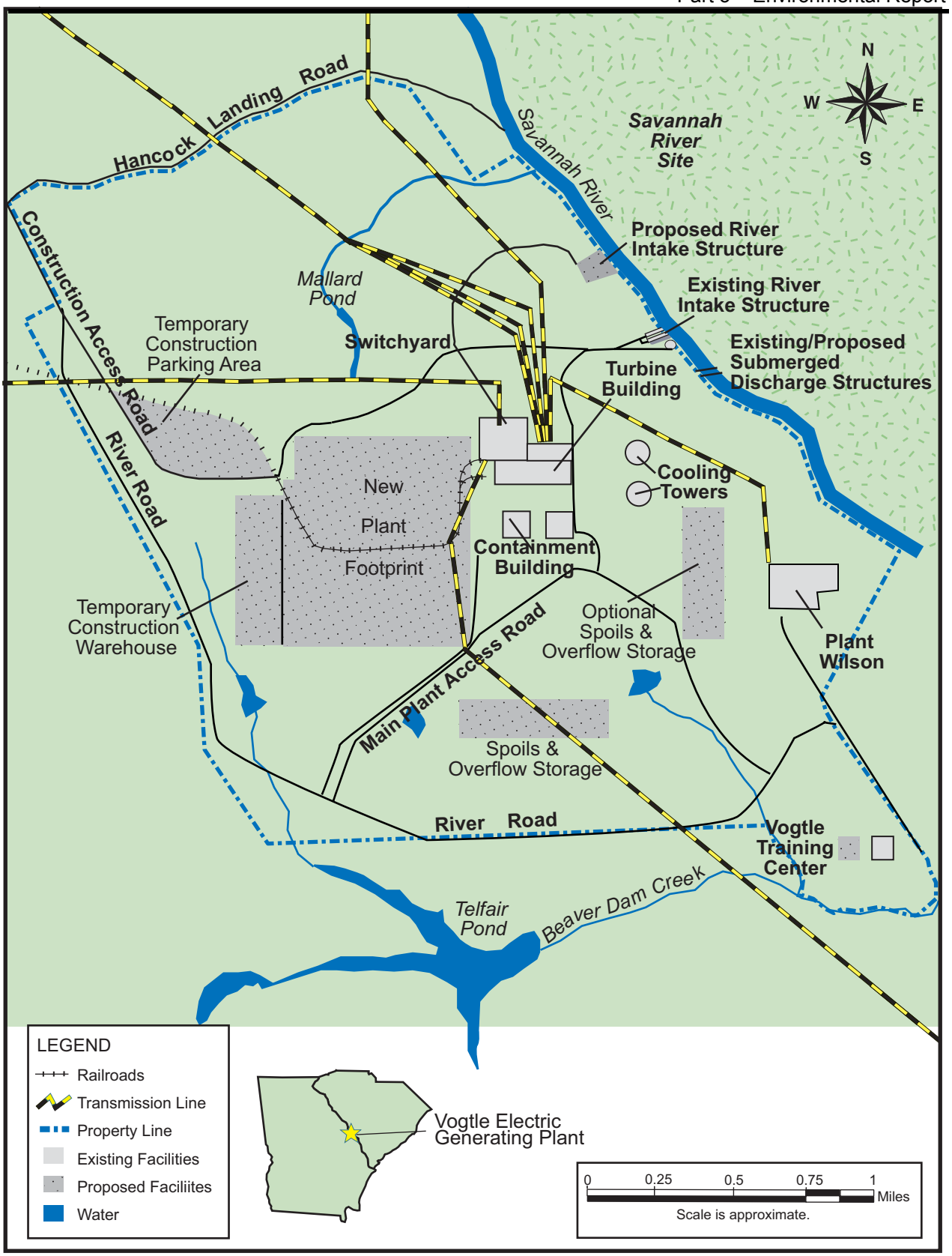

Figure 2.1-1 VEGP Site and Proposed New Plant Footprint

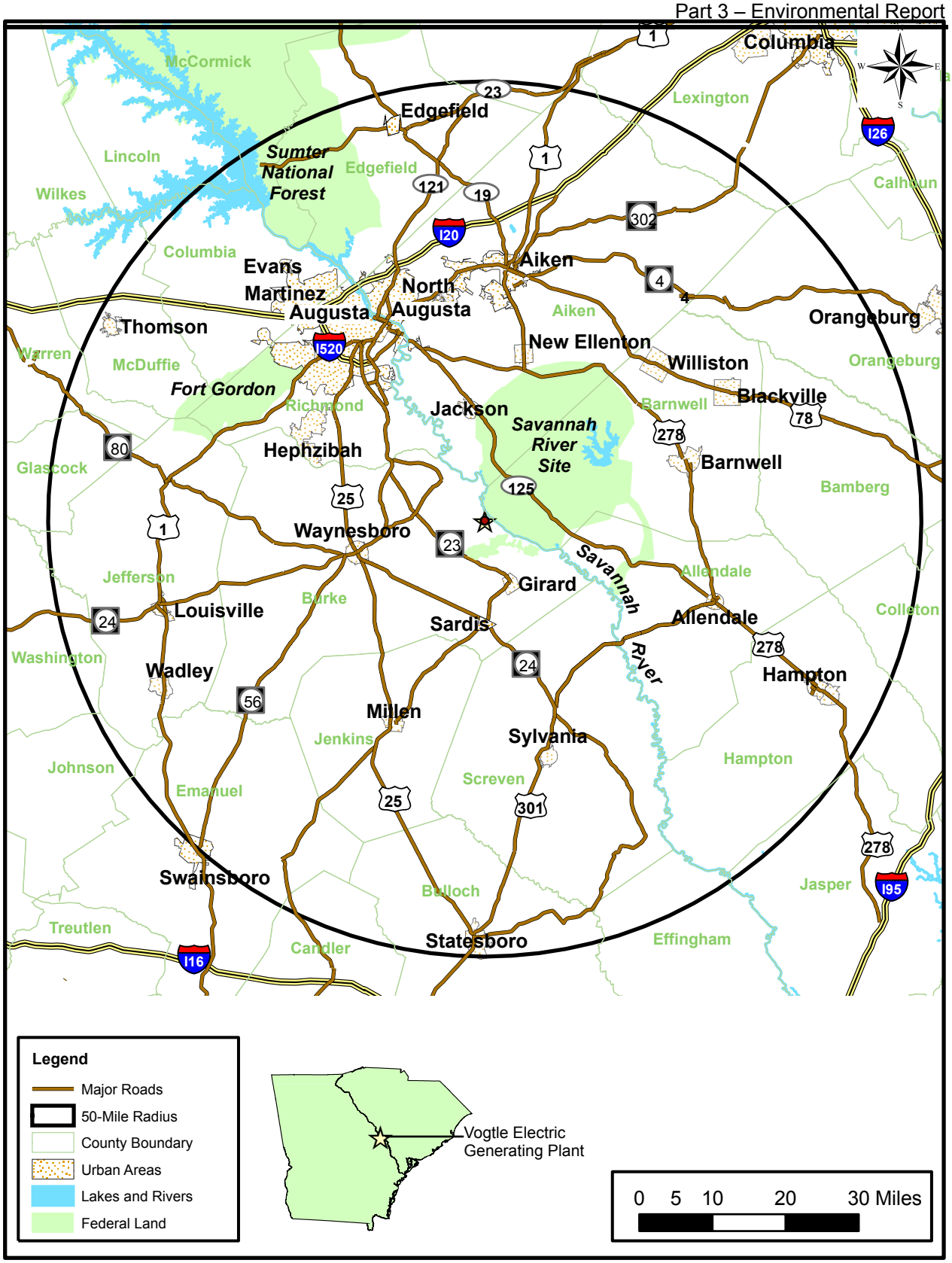

Figure 2.1-2 50-Mile Region

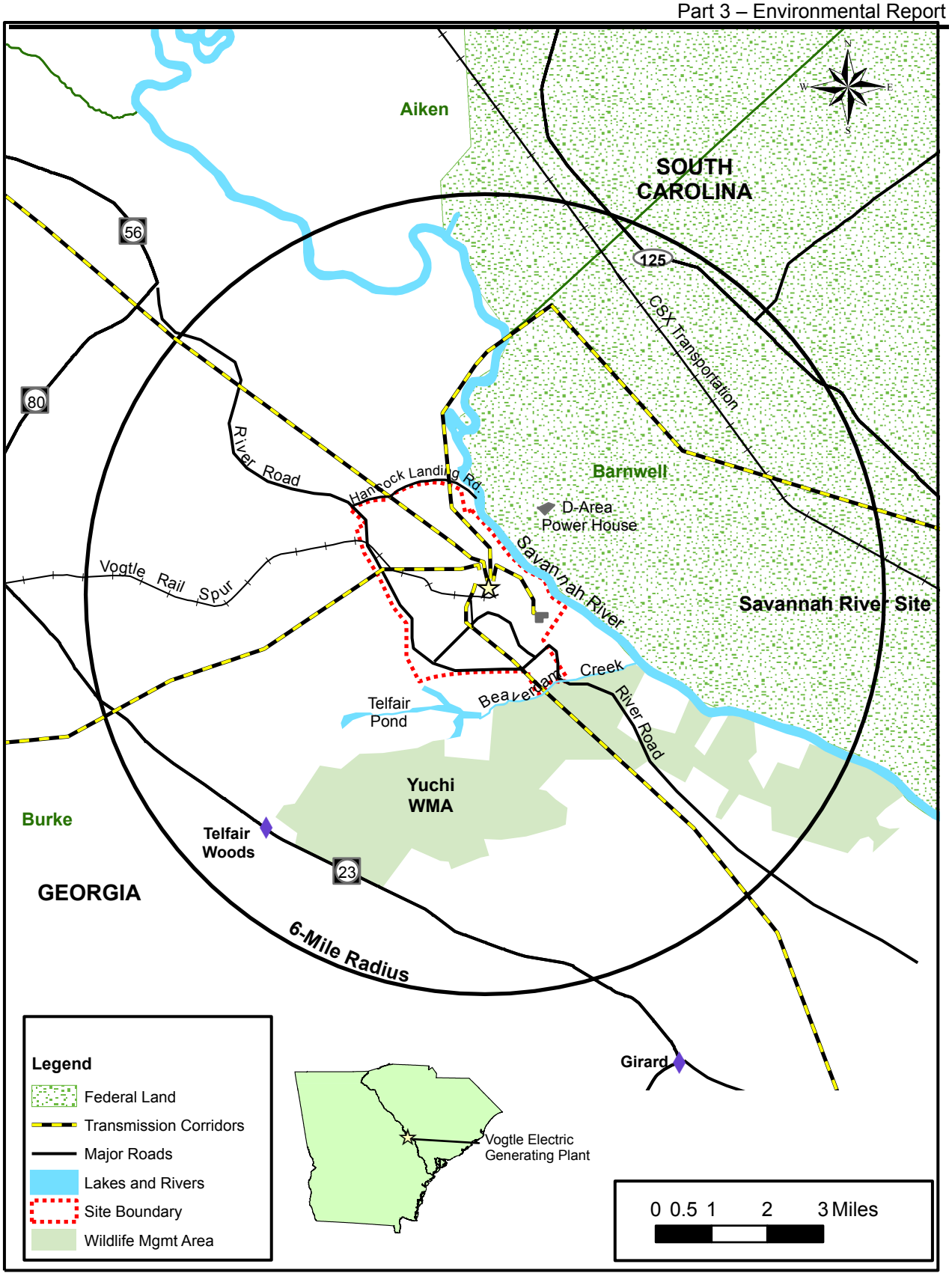

Figure 2.1-3 6-Mile Vicinity

2.2 Land

This section describes the land characteristics of the VEGP site and the vicinity, transmission corridors and offsite areas, and the region.

2.2.1 The Site and Vicinity

2.2.1.1 The Site

The 3,169-acre VEGP site is bounded by the Savannah River on the east, Hancock Landing Road on the north and River Road on the west and south (Figure 2.1-1). Georgia Power Company (GPC), Oglethorpe Power Corporation (OPC), Municipal Electric Authority of Georgia, and the City of Dalton, a municipality in the State of Georgia, doing business by and through the Water, Light and Sinking Fund Board of Commissioners (Dalton Utilities) own the VEGP Units 1 and 2 and most of the site property. Also on the VEGP site is the GPC-owned 354 MWe Plant Wilson facility composed of six oil-fueled combustion turbines. GPC provides support and direction for land management activities for the VEGP site property. Southern Nuclear Operating Company (SNC) is the Nuclear Regulatory Commission (NRC) licensed operator for VEGP Units 1 and 2 and manages and controls access to the site.

GPC developed a land management plan to ensure compliance with environmental regulations and permits and implemented a program with emphasis on forestry and wildlife. The plan also considers the needs of plant security, project management, construction, and power generation. The plan went into effect in January 1983 and is periodically updated. The plan dedicates undeveloped areas of the site to managing natural longleaf pine, and maintaining the existing hardwood communities. Slash pine and cover crops were used to revegetate parts of the original VEGP Units 1 and 2 construction site. **(GPC 1985)**

The 3,169-acre site includes land developed for industrial use, previously disturbed land and undeveloped land. The existing VEGP Units 1 and 2 and auxiliary facilities, including the Vogtle Training Center, Plant Wilson, construction facilities, and transmission rights-of-way occupy about 800 acres. Areas on the site that have been previously disturbed, including the proposed VEGP Units 3 and 4 footprint, have been revegetated with a mix of planted pines and old field vegetation. Much of the site is wooded. Figure 2.2-1 illustrates the U.S. Geological Survey (USGS) land use classifications on the VEGP site. Section 2.4.1.1 provides a description of the undeveloped portion of the site.

Several water bodies and streams exist on the site or border the site. Beaverdam Creek which drains Telfair Pond (located south of VEGP) is a major stream that borders the VEGP site south of the Vogtle Training Center. Several drainages drain from VEGP property to Beaver Dam Creek (Figure 2.1-3). A second, small stream drains north out of Mallard Pond, north of the proposed new plant footprint. Both ponds are impounded blackwater creeks **(GPC 1985).** Several borrow pits and two sediment retention basins constructed to control storm water runoff

are on site. The sediment retention basins south of the industrial area are permanent ponds and will be used to support management of stormwater from the new Unit 3 and 4 construction area.

Most of the VEGP site property lies outside the 500-year floodplain. The Savannah River 100-year floodplain ranges from approximately 100 to 800 feet wide at the VEGP site **(FEMA 1989)**. The floodplain is separated from the rest of the VEGP site by steep bluffs along virtually all of the VEGP site river shoreline. The Savannah River is not designated a wild and scenic river **(**16 USC 1271 – 1287; **NPS No Date)**.

In 1993, the VEGP site was designated as a Certified Wildlife Habitat by the Wildlife Habitat Council, a non-profit, Washington D.C.-based wildlife organization. The certification considered the wildlife enhancement work performed after original construction and a new plan developed in the early 1990's.

No railroads, transmission corridors (other than those owned and operated by GPC), natural gas pipelines, or major waterways traverse the VEGP site. Several communication facilities are on GPC property. West of the facility is the Vogtle Fiberoptic Site (the old Microwave Site). Fiberoptic fiber from offsite comes into VEGP through this building. The fiber to Augusta exits the building to the south on poles to the 150 kV line near River Road. The fiber that goes south goes underground to the 500 kV line tower just to the southwest of the building. The fiber into the facility leaves the building underground east-southeast to the Security duct. The tower is home to the antennas for the NOAA transmitter, the Emergency Alert Siren Radio, and a variety of radios for the emergency notification network. Southwest of the facility are two meteorological towers which are discussed in detail in Section 6.4. Southeast of the plant is the Motorola iDEN (Integrated Digital Enhanced Network) tower, a SouthernLinc (Southern Company communications) site but the tower is owned by Global Signal Inc. (formerly Pinnacle Towers Inc.). The tower at Plant Wilson has an antenna for the Georgia Department of Natural Resources and antenna for the Emergency Alert Siren Radio in South Carolina. Access to the VEGP site is primarily through a VEGP-owned and maintained road off River Road.

No prime farmland soils occur on the VEGP site **(USDA 1986)**. Burke County is developing zoning regulations, but the VEGP site currently is not zoned.

2.2.1.2 The Vicinity

The VEGP site is in the Coastal Plain, approximately 25 miles east of the Piedmont Province **(GPC 1972)**. The topography of the vicinity consists of low rolling hills with elevations ranging from 80 feet to 280 feet above mean sea level **(GPC 1985)**.

The Georgia side of the Savannah River within 6 miles of the VEGP site is primarily rural undeveloped land with a few homes and small farms. Figure 2.2-2 identifies USGS land use classifications in the vicinity of VEGP. The crossroads community of Telfair Woods is approximately 5 miles southwest of VEGP (Figure 2.1-3). Girard (population 230) is

approximately 8 miles to the south. A small, privately-owned airstrip, known as Rhodes Air Ranch, is located just north of the site boundary.

Much of the undeveloped land in the vicinity is sandhill-upland pine or oak-hickory hardwood communities. GPC provides access to the Savannah River via a concrete boat ramp, along with parking and a recreational area with picnic tables at its boat landing, immediately downstream of the VEGP property. The 7,000-acre Yuchi Wildlife Management Area (WMA) managed by Georgia Department of Natural Resources (DNR) is adjacent to VEGP property. Hunting, fishing, and primitive camping are allowed on the Yuchi WMA. No other recreation areas are within 6 miles of the VEGP site. No mineral deposits or mines occur in Burke County **(USGS 2003a)**. Forty-five percent of the soils in Burke County are classified as prime farmland **(USDA 1986)**. Forty-one percent of Burke County was farmland in 2002 **(NASS no date; Georgia.gov 2005)**. Of that 41 percent, 48 percent was in cropland, 42 percent was in woodland 6 percent was pasture and 4 percent was other uses. The largest money crops in the county are cotton and cottonseed, and milk and other dairy products from cows **(NASS no date)**. Burke County is revising its comprehensive plan, and has indicated zoning classifications will be established. Burke County currently does not have zoning classifications.

The Savannah River Site (SRS), a U.S. Department of Energy facility with restricted access, is directly across the Savannah River from VEGP. SRS has two industrial areas which are no longer active and have undergone remediation and one fossil-fueled power plant within the 6-mile radius. The remainder of the SRS within the 6-mile radius is river swamp, bottomland hardwood or upland pine-hardwood communities. The U.S. Forest Service maintains pine plantations on SRS land that is not industrial. Barnwell County, South Carolina has no mineral deposits or mines **(USGS 2003b)**.

2.2.2 Transmission Corridors and Offsite Areas

2.2.2.1 Existing Corridors

The existing transmission system supporting VEGP Units 1 and 2 has two 500 kV lines and four 230 kV lines in four corridors. There is an additional 230 kV line to the Wilson Station. The Wilson connection provides offsite power in case of emergency.

The two 500 kV transmission lines (Scherer and Thalmann) run in separate corridors, and the four 230 kV lines (Goshen [black], Goshen [white], Augusta Newsprint, and SCE&G), generally run in two additional corridors. The Plant Wilson line connects the Wilson Plant switchyard to the VEGP switchyard and is totally within the owners' property, and thus is not further discussed in this section. Figure 2.2-3 depicts the existing transmission system. The figure also shows major highway crossings and historically or environmentally significant areas. Table 2.2-1 provides information on land use along the corridors. Each corridor is described as follows:

Scherer – This corridor runs generally westward to Plant Scherer, north of Macon, Georgia. Built in 1986, it is 154 miles long and is mostly 150 feet wide, but up to 400 feet wide in some locations. The terrain is flat to rolling.

Thalmann – Running 159 miles to the south, this 150-foot-wide corridor connects VEGP to the West McIntosh substation near Plant McIntosh, just north of Savannah, Georgia then continues to its termination at the Thalmann substation near Brunswick. The VEGP Final Environmental Statement (FES) **(NRC 1985)** examined the entire 159 miles of transmission line, however, today, the VEGP line terminates at West McIntosh. Data for the entire Thalmann corridor are provided in Table 2.2-1. This line is also known as the McIntosh line.

South Augusta – This corridor contains three 230-kV transmission lines that run north to the Goshen and Augusta Newsprint substations. The Goshen substation (2 lines) is approximately 19 corridor miles from VEGP, and the corridor is 275 feet wide. The Augusta Newsprint substation is approximately 20 corridor miles from VEGP. Augusta Newsprint shares the South Augusta corridor with the Goshen lines for approximately 17 miles. From that point to its termination at the substation it is 100 to 125 feet wide. The Augusta Newsprint line was built in 1983 and the Goshen lines were built in 1986. The terrain is generally flat.

SCE&G – Built in 1986, this corridor runs north and east for 4.5 miles to cross the Savannah River and then an additional 17 miles to a substation operated by South Carolina Electric and Gas. The corridor in South Carolina is 100 feet wide and the 4.5-mile Georgia segment is 125 feet wide. The part of the corridor in South Carolina is wholly contained on the SRS. The terrain is mostly flat.

2.2.2.2 Proposed Transmission Corridor

The existing transmission corridors to the VEGP site will support generation from existing Units 1 and 2 as well as the new Units 3 and 4. GPC and SNC estimate one additional 500 kV line will be required to distribute the additional generation. The proposed new switchyard will contain an extra 500 KV bay to support an additional 500 KV line for potential future expansion. The final route of the new transmission line has not been determined. Initially, SNC developed a bounding analysis based on the known end point and counties the line will traverse. SNC evaluated the proposed new corridor route through Burke, Jefferson, McDuffie and Warren Counties. Land use in these counties is presented in Table 2.2-2 and Figure 2.2-4. The impact analysis is addressed at a county level in Section 4.1.2. GPC recently completed a study of the proposed route macro-corridor for this transmission line to provide detailed information to support the NRC NEPA analysis. This study (**Photo Science 2007**), was developed in early 2007 to identify potential corridors for the proposed transmission line relative to existing land uses and habitats, including special land use classifications (e.g., National or State Parks, military reservations, floodplains, wetlands), and previously-confirmed cultural resources and threatened or endangered species. The study also examined corridor route alternatives in

general, based on the attributes of the identified corridors. Corridors are defined as transmission line routes of variable widths though a larger land area (study area) between VEGP and the end point of the transmission line. The term right-of-way refers to a precisely described routing of a transmission line, such as an easement of specific width; whereas a "corridor" is a more general route of sufficient width to contain the eventual right-of-way. The macro-corridor study utilized an established process and techniques for identification of corridors supported by computerized, state-of-the-art data analysis and mapping. The study defined a macro-corridor that varies from less than one mile to a little over three miles in width over the more than 50-mile length of the corridor. GPC then prepared a study of route alternatives using the EPRI-GTC Transmission Line Siting Methodology **(EPRI 2006)** to develop options for final line routing based on environmental, social, and cultural impacts. Additional detailed analysis will be conducted by a GPC team that will evaluate each alternate route within the corridor and ultimately select the preferred route.

The EPRI-GTC Transmission Line Siting Methodology incorporates a computer-based methodology developed by the Electric Power Research Institute (EPRI) and Georgia Transmission Corporation (GTC). It is used as a tool to evaluate the suitability of individual land tracts (grid cells) based on land use types for locating transmission facilities. Based on analysis of a large area between and in the vicinity of the endpoints of a line, a macro-corridor and study area are developed. By evaluating more detailed information about the grid cells within the study area, alternate corridors are identified. The EPRI-GTC method is objective, comprehensive, and consistent. It allows the utility to consider vast amounts of information and to quantitatively consider stakeholder input to develop the alternate corridors that ultimately lead to selection of the preferred corridor.

2.2.2.3 Land Use Issues

Land use along the existing corridors is presented in Table 2.2-1. The table breaks the Thalmann corridor into two segments (VEGP-West McIntosh and West McIntosh-Thalmann) to facilitate an understanding of how the proposed action will affect existing transmission corridors.

Special land uses along these corridors include the following as depicted on Figure 2.2-3:

- 17.1 miles on the SRS, which has restricted public access except along South Carolina Highway 125, which the transmission line crosses
- 4.4 miles of Oconee National Forest, northeast of Plant Scherer
- Ebenezer Creek Swamp crossed by the VEGP-West McIntosh line near its termination. Although privately owned, Ebenezer Creek Swamp is designated as a National Natural Landmark. It is part of the 29,000-acre Savannah National Wildlife Refuge. The State of Georgia has designated 7 miles of Ebenezer Creek as a Georgia Scenic River (Georgia Code Chapter 12, Section 12-5-352). Appendix J of the VEGP Units 1 and 2 FES identifies this crossing as receiving attention by the U.S. Fish and Wildlife Service (USFWS), which

provided recommendations on crossing the swamp. GPC implemented special construction practices to protect the swamp and has procedures that specifically address corridor and transmission line maintenance in this swamp, in accordance with the VEGP Environmental Protection Plan.

- Francis Plantation in Washington County, crossed by the VEGP-Scherer transmission corridor. The current VEGP Units 1 and 2 Environmental Protection Plan specifies that vegetation trimming in the Plantation shall be performed manually.
- A Georgia Power Company Transmission Bulletin identifies 196 cultural properties on existing Vogtle transmission lines and provides specifications for protecting these sites based on the Cultural Resources Plan approved by the Georgia State Historic Preservation Officer.

Land use associated with the proposed 500 kV Vogtle-Thompson line is discussed in detail in the macro-Corridor Report (**Photo Science 2007**).

2.2.3 The Region

All or parts of 28 counties (12 in South Carolina and 16 in Georgia) are within 50 miles of the VEGP site (Figure 2.1-2). The 50-mile radius is bordered by interstates on all sides; I-16 from Atlanta to Savannah lies to the southwest, I-95 lies to the east, I-26 from Columbia to Charleston, SC, lies to the northeast and I-20 from Atlanta to Columbia, is to the northwest. Only I-20 actually has any mileage within the 50-mile radius. Additional major transportation infrastructure within the region is discussed in Section 2.5.2.2.

This section focuses on three Georgia counties as the region of impact for the construction and operation of new units at VEGP - Burke, Columbia and Richmond - where 79 percent of current VEGP employees reside (see Section 2.5.1). Most land use changes will be due to increases in tax revenues associated with new units at VEGP, which will be limited to the county where the site is located (Burke), or population changes in counties where the greatest number of construction or operations employees will live (Burke, Richmond, and Columbia).

The State of Georgia mandates that cities and counties have comprehensive land use plans, and Burke, Richmond and Columbia Counties have such plans. Table 2.2-3 shows a breakdown of land use type and area in those counties.

Burke County

Burke County has the second largest land area of any county in Georgia. The predominant land uses are agriculture and forestry (76 percent of the unincorporated area in the county in 1990). Fifteen percent of the county is classified as preferential agriculture, and thus bound by covenant to remain agricultural for a given time. Less than 1 percent of the land was classified as industrial or commercial in 1990. The only major park, recreation area or conservation area is the Yuchi Wildlife Management Area, owned by the Georgia DNR. **(Burke County 1991)**

In 2002, Burke County had 494 farms; 176 produced cattle (up from 157 in 1997), 18 had hogs. Very few farms had poultry. In 2002, 248 had harvested cropland: 54 farms produced cotton (down from 66 in 1997), 36 produced soybeans (down from 73 in 1997), and 50 produced peanuts (down from 56 in 1997). **(USDA 2004)**

Columbia County

Sixteen percent of the total land in Columbia County is non-forestry farmland. Crops include corn, soybeans, and wheat. Commodities include forestry, dairy, beef, and greenhouse production (nursery plants). Harvested crops and livestock production have been steadily decreasing. In 1992 the county reported 3,046 acres of harvested cropland. By 1997, harvested cropland had decreased to 2,292 acres. In 1992, 5,400 head of cattle were reported. In 1997, that number had declined to 4,600 head. **(Columbia County 2000)**

Currently 140,500 acres (76 percent) of Columbia County is forested. The forest industry owns 31,600 acres and timber is the highest-valued commodity in the county. **(Columbia County 2000)**

Major parks, recreation and conservation areas in Columbia County include a portion of Clarks Hill Lake, the Augusta Canal, Mistletoe State Park, Heggie's Rock, and Stallings Island. The county is developing a greenway system. Clarks Hill Lake (known as S. Strom Thurmond Lake in South Carolina) is a 70,000 acre U.S. Army Corps of Engineers reservoir on the Savannah River. It provides recreation, wildlife refuges and conservation, flood prevention and drinking water to Georgia and South Carolina. Heggie's Rock is near Appling and is one of Georgia's 12 natural landmarks. It is home to many endangered plant and animal species and is owned by The Nature Conservancy. Stallings Island is in the Savannah River and is thought to be the earliest Colonial settlement in the county. It is on the National Register of Historic Places. **(Columbia County 2000)**

Richmond County

Seven percent of Richmond County was non-forestry farmland in 1997. Crops include corn, soybeans, and peanuts. Commodities include forestry, dairy and beef production, and ornamental horticulture. Harvested cropland increased by 16 percent between 1992 and 1997. **(ARC 2004)**

Currently 121,000 acres (58 percent) of Richmond County is forested. Fifty-six thousand acres are owned by private individuals, 39,000 acres are owned by the Federal government (Fort Gordon), and 17,000 acres by the forest products industry. **(ARC 2004)**

Major parks, recreation and conservation areas in Richmond County include the Savannah River, the Augusta Canal, Phinizy Swamp WMA and Nature Park, Merry Brickyard Ponds, and Spirit Creek Education Forest. Phinizy Swamp WMA is a 1,500-acre, state-owned cypress wetland approximately 2 miles from downtown Augusta. Phinizy Swamp Nature Park is an

1,100-acre park south of Phinizy Swamp WMA. It is owned by the City of Augusta. Merry Brickyard Ponds are clay strip pits that have filled with water and evolved into nationally recognized waterfowl habitat. **(ARC 2004)**

There are no Native American tribal land use plans for areas within the region.

Table 2.2-1 Land Use Along Existing Transmission Corridors

Corridor	Land Use Categories			
	Agricultural	Forest	Industrial	Residential
VEGP-Scherer				
Percent	29	63	<1	<1
Area (acres)	1,041	2,299	21.5	34.5
VEGP-Thalmann				
VEGP-West McIntosh				
Percent	32	29	0	0
Area (acres)	397	362	0	0
West McIntosh-Thalmann[1]				
Percent	5	68	<1	3
Area (acres)	74.8	1,113	13.4	53.7
VEGP-South Augusta				
Percent	14	75	<1	2.8
Area (acres)	92.5	494	0.62	18.2
VEGP-SCE&G				
Percent	4	69	0	0
Area (acres)	11.4	188	0	0

Source: **EPA 1994**

[1] Provided to be consistent with the VEGP license renewal application.

Table 2.2-2 Land Use as Percent in Burke, Jefferson, McDuffie and Warren Counties

County	Land Use Categories					
	Agricultural	Forest	Water	Wetland	Barren	Urban[1]
Burke	46	43	<1	9	1	<1
Jefferson	40	48	<1	10	<1	1
McDuffie	16	78	3	<1	<1	3
Warren	22	76	<1	<1	<1	1

Source: **EPA 1994**

[1] Includes residential, commercial, industrial, transportation, communication, utilities, and other urban or built-up land.

Table 2.2-3 Land Use in Acres in Burke, Columbia and Richmond Counties

Land Uses	Burke County[1] (1990)	Columbia County[2] (2000)	Richmond County[3] (2003)
Residential	25,767	43,172	54,328
Commercial	731	2,416	5,772
Industrial	201	2,211	9,402
Transportation/ Communications/ Utilities	No data	7,671	11,893
Public/Institutional	9,254	4,322	52,890
Parks/Open Space/ Conservation	No data	10,304	5,903
Agriculture/Forestry/ Undeveloped	440,307 (includes open space)	126,727	70,020

1 **Burke County 1991**, Table 6-1
2 **Columbia County 2000**, Table L-1
3 **ARC 2004**, Table L-1

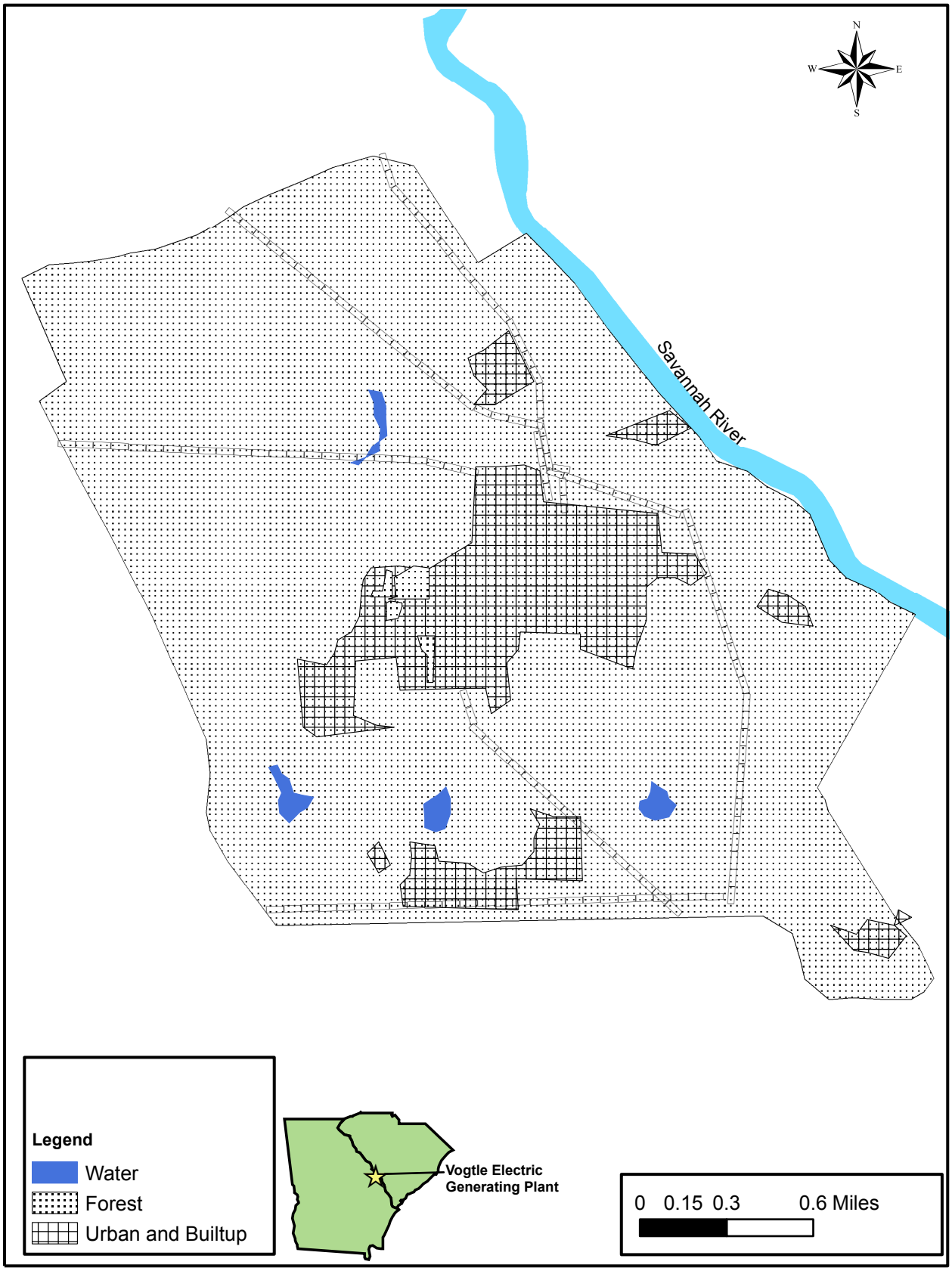

Figure 2.2-1 USGS Land Use Classifications at VEGP Site

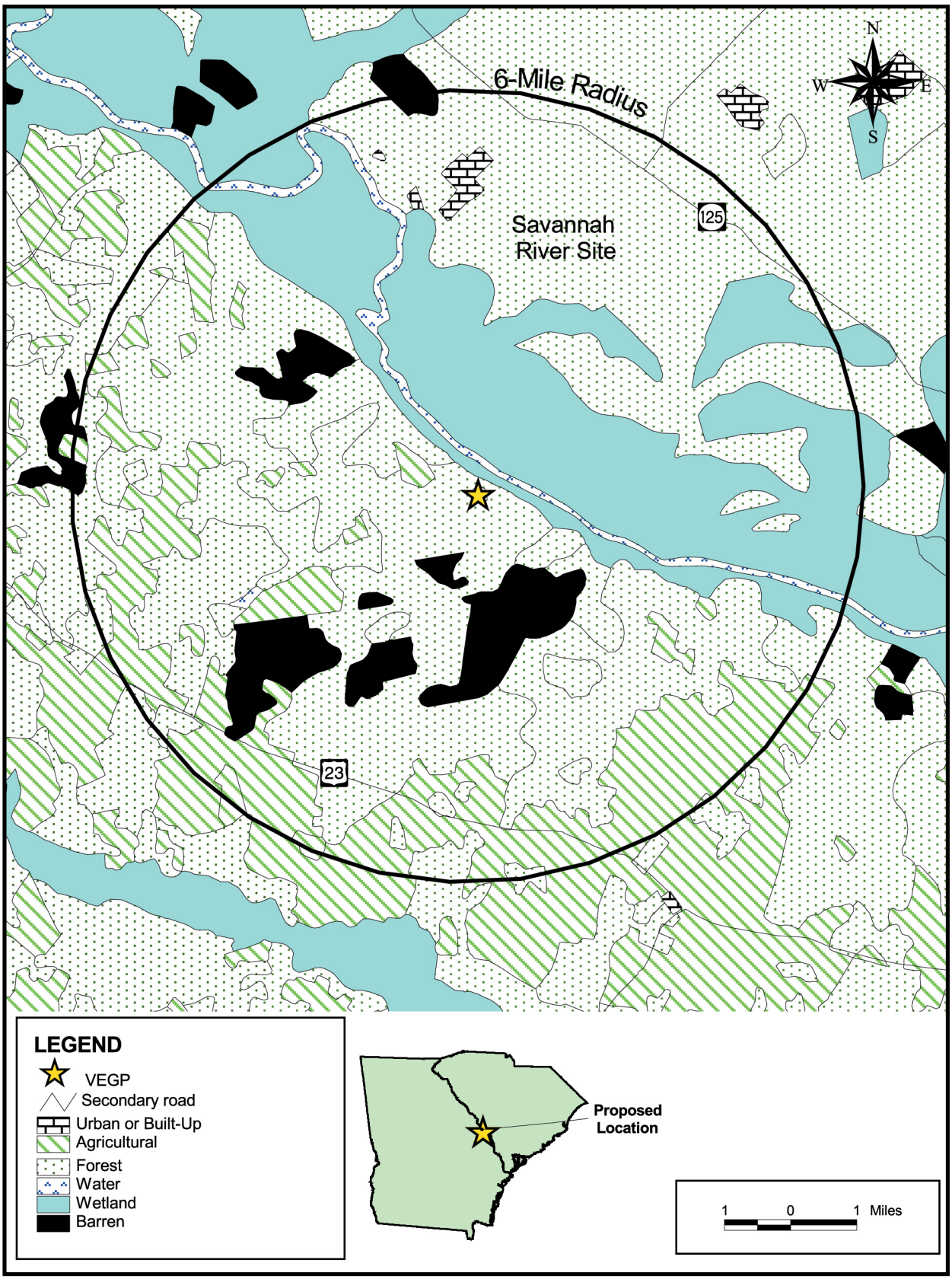

Figure 2.2-2 USGS Land Use Classifications in the vicinity of the VEGP site

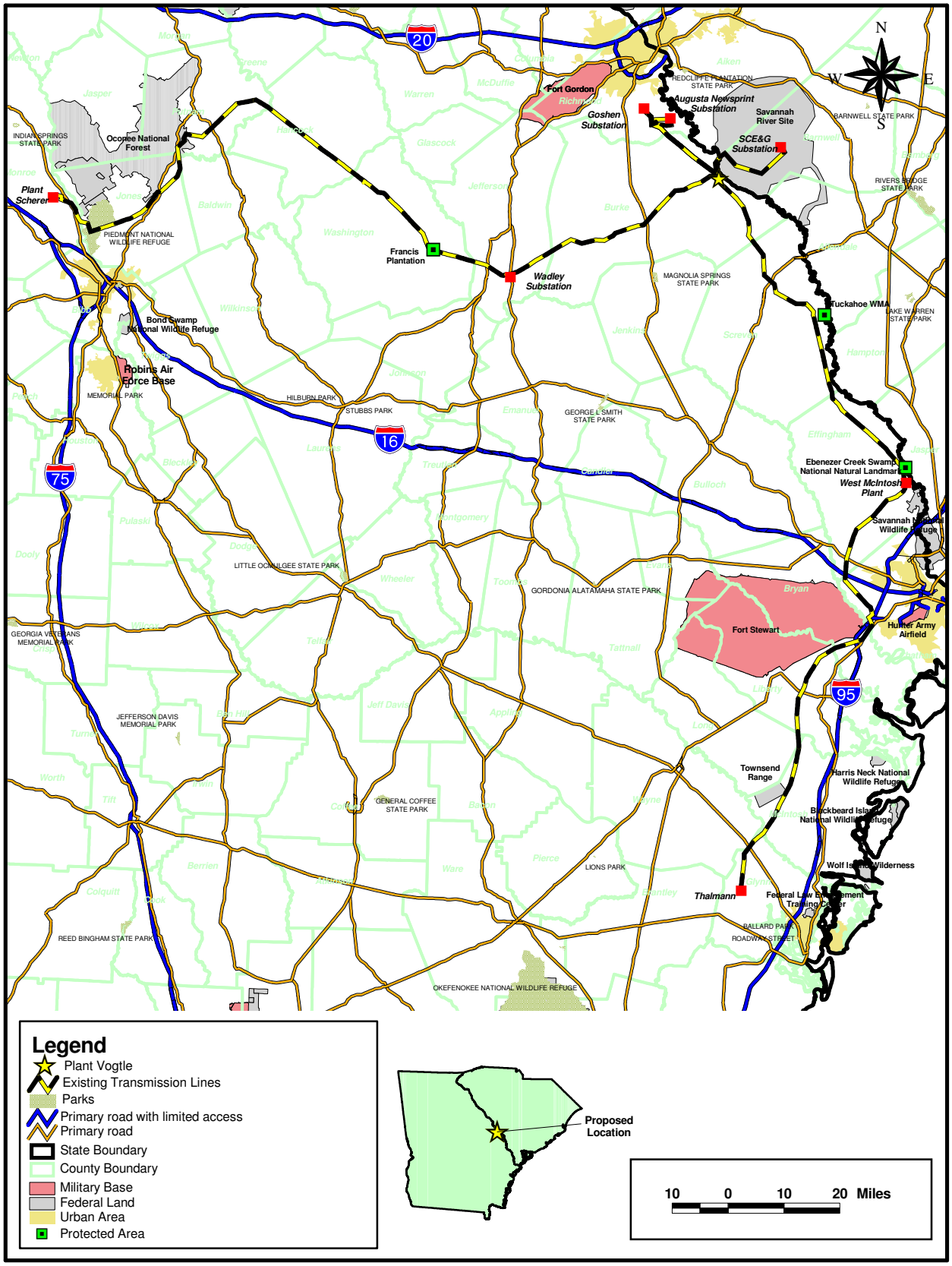

Figure 2.2-3 Existing Transmission System

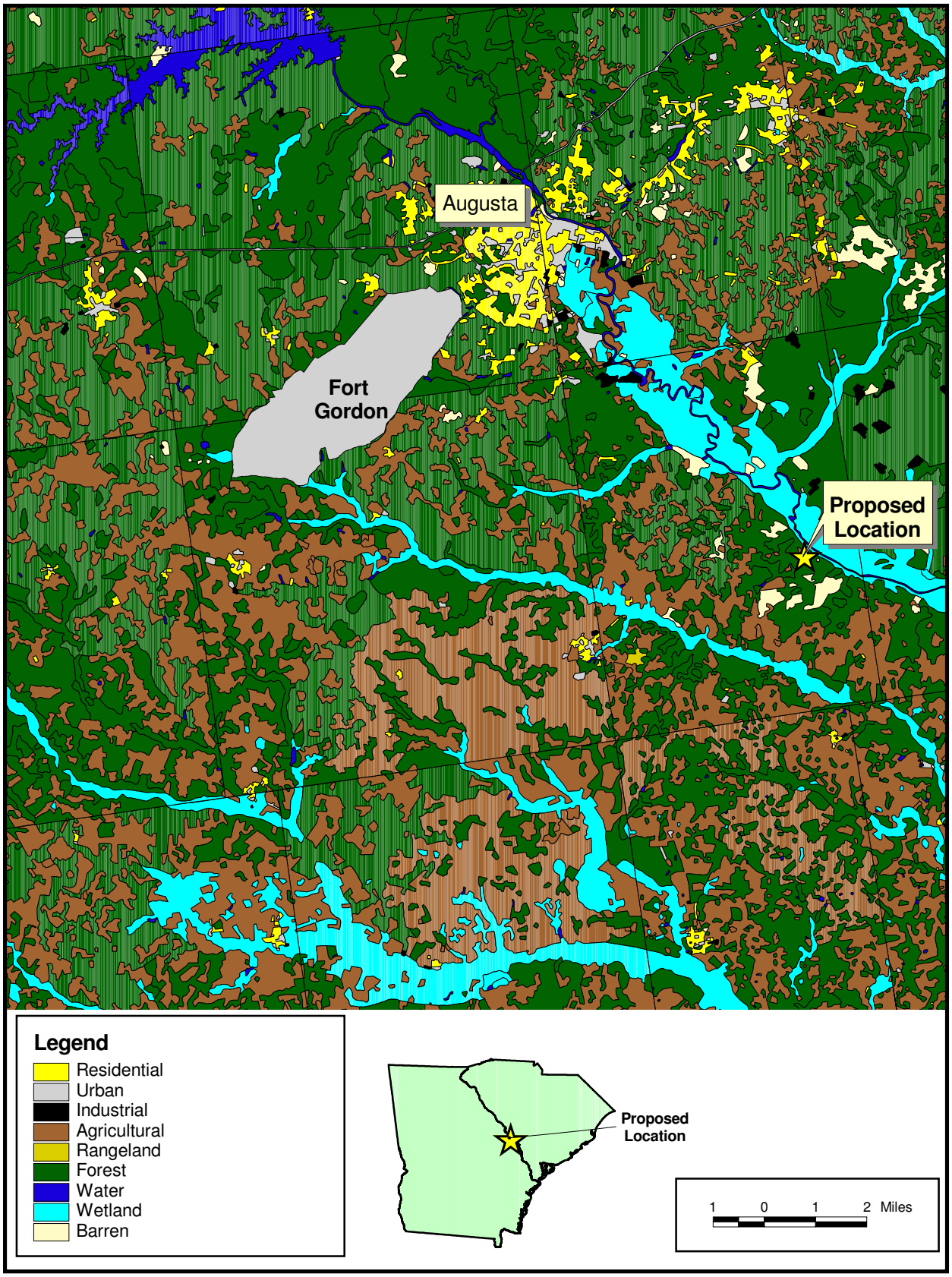

Figure 2.2-4 Land Use in the Area of the Proposed Corridor

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