

DOE/EIS-0575

**Final Environmental Impact Statement for the Proposed Equipment
Modernization and Digital Modernization of the Edwin I. Hatch
Nuclear Plant, Units 1 and 2 in Appling County, Georgia DOE/EIS-0575**

**U.S. Department of Energy Relied Upon Final Environmental Impact
Statement NUREG-1437, Supplement 4, Generic Environmental Impact
Statement for License Renewal of Nuclear Plants: Regarding Edwin I.
Hatch Nuclear Plant, Units 1 and 2 - Final Report**

**U.S. Department of Energy, Loan Programs Office:
Energy Dominance Financing, 1706 Program**



November 2025

Lead Federal Agency: U.S. Department of Energy

Title: Final Environmental Impact Statement for the Proposed Equipment Modernization and Digital Modernization of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 in Appling County, Georgia DOE/EIS-0575

DOE relied upon NUREG-1437, Supplement 4, Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Edwin I. Hatch Nuclear Plant, Units 1 and 2 - Final Report

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Proposed Action: The U.S. Department of Energy (DOE) is considering whether to issue a loan guarantee of a funding facility to the Georgia Power Company (GPC) pursuant to its authority under the EDF Program. In its application, GPC has identified the Hatch Nuclear Plant (HNP) Project (the Project), in Appling County, Georgia, for inclusion in the funding facility that is the subject of DOE's loan guarantee. GPC may request inclusion of multiple individual projects with independent utility in the funding facility that is the subject of the DOE loan guarantee; accordingly, DOE will complete an environmental review pursuant to the National Environmental Policy Act (NEPA) for these projects prior to their inclusion in the funding facility that is the subject of DOE's loan guarantee.

The subject of Federal financial assistance being sought from the DOE for HNP is for equipment modernization and digital modernization associated with the existing NRC license allowing power generation until 2034 (Unit 1) and 2038 (Unit 2). All Project activities will take place inside the facilities at HNP. No ground disturbing activities (e.g., site clearing, fill and excavation) or permanent above-ground construction or exterior alterations are anticipated to support any of the activities that are the subject of the proposed Federal financial assistance. Descriptions of the Project activities that are the subject of the proposed Federal financial assistance are provided below.

Equipment Modernization includes a range of capital upgrades and improvements that are crucial for maintaining the plant's efficiency, reliability, safety, and regulatory compliance. Proposed activities for HNP include:

1. Spare Generator Step-Up Transformer Replacement
2. Plant Service Water Stainless Steel Pump Upgrades (7 out of 8)
3. Unit 1 Steam Dryer Upgrade
4. Control Rod Drive Replacements
5. Turbine Valve Replacements
6. Recirculation Motor Replacement

Digital Modernization includes upgrades to plant analog control systems designed in the 1960s and 1970s with modern digital control systems. These projects are crucial for maintaining the plant's efficiency, safety, and regulatory compliance without interrupting its energy production. Proposed activities for HNP include:

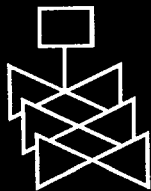
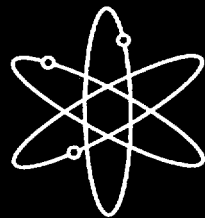
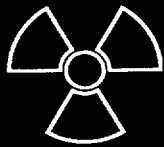
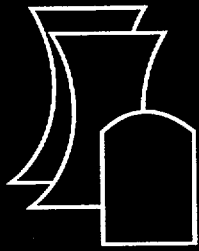
1. Turbine Controls Upgrade
2. EX2100 Upgrade
3. Steam Jet Air Ejector

National Environmental Policy Act (NEPA) Process:

The HNP in Appling County, Georgia, is an operating nuclear power generation facility that is licensed to operate until August 2034 (Unit 1) and June 2038 (Unit 2), see <https://www.nrc.gov/reactors/operating/licensing/renewal/applications/hatch#eis>). DOE completed an independent evaluation of the 2001 NRC Final SEIS, Supplement 4, and determined that the NRC Final SEIS fully encompasses the activities that are the subject of DOE's proposed Federal financial assistance (i.e. the actions are substantially the same), that the analyses in the original document remain sufficient, and that the documentation satisfies DOE's NEPA responsibilities.

In addition, DOE reviewed the 2001 NRC Final SEIS, Supplement 4 in accordance with the requirements of 10 CFR 1022 for floodplain and wetland assessments, as well as the regulatory agency consultations that were previously completed. The NRC Final SEIS provides floodplain and wetland information and analyses to support LPO's conclusion that no impacts on floodplains or wetlands are associated with the activities that are the subject of the proposed Federal financial assistance. LPO reviewed the regulatory agency consultations completed pursuant to the National Historic Preservation Act and issued a Finding of No Historic Properties Affected, consistent with 36 CFR § 800.4(d)(1). On October 2, 2025, the Georgia State Historic Preservation Officer concurred with LPO's finding of No Historic Properties Affected, due to the scope and location of work associated with DOE's undertaking (i.e. Federal financial assistance for equipment modernization and digital modernization at HNP).

Accordingly, DOE is relying on the 2001 NRC Final SEIS and the additional reviews and consultations and republishing the document as DOE Final EIS (DOE/EIS-0575).



Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 4

Regarding the Edwin I. Hatch Nuclear Plant, Units 1 and 2

Final Report

**U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555-0001**



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Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 4

Regarding the Edwin I. Hatch Nuclear Plant, Units 1 and 2

Final Report

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Date Published: May 2001

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001



Abstract

The U.S. Nuclear Regulatory Commission (NRC) considered the environmental effects of renewing nuclear power plant operating licenses for a 20-year period in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, and codified the results in 10 CFR Part 51. The GEIS (and its Addendum 1) identifies 92 environmental issues and reaches generic conclusions related to environmental impacts for 69 of these issues that apply to all plants or to plants with specific design or site characteristics. Additional plant-specific review is required for the remaining issues. These plant-specific reviews are to be included in supplements to the GEIS.

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC by Southern Nuclear Operating Company (SNC) to renew the operating licenses (OLs) for Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, for an additional 20 years under 10 CFR Part 54. This SEIS includes the staff's analysis that considers and weighs the environmental effects of the proposed action, the environmental effects of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse effects. It also includes the staff's recommendation regarding the proposed action.

Neither SNC nor the staff has identified significant new information for any of the 69 issues for which the GEIS reached generic conclusions and which apply to HNP. Therefore, the staff concludes for these issues that the impacts of renewing the HNP OLs will not be greater than the impacts identified in the GEIS for these issues. For each of these issues, the GEIS conclusion is that the impact is of SMALL significance (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel, which were not assigned a single significance level) and that additional mitigation measures are likely not to be sufficiently beneficial to be warranted.

Each of the remaining 23 issues that applies to HNP is addressed in this SEIS. For each applicable issue, the staff concludes that the significance of the potential environmental effects of renewal of the OLs is SMALL. The staff has not identified any new issue applicable to HNP that has a significant environmental impact. The staff also concludes that additional mitigation measures are not likely to be sufficiently beneficial to be warranted.

The NRC staff recommends that the Commission determine that the adverse environmental impacts of license renewal for HNP, Units 1 and 2, are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2) the Environmental Report submitted by SNC; (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments.

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Executive Summary

By letter dated February 29, 2000, Southern Nuclear Operating Company (SNC) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, for an additional 20-year period. If the operating licenses are renewed, Federal (other than NRC) agencies, State regulatory agencies, and the owners of the plant will ultimately decide whether the plant will continue to operate. This decision will be based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the operating licenses are not renewed, HNP, Units 1 and 2, will be shut down on or before the expiration dates of the current operating licenses, which are August 6, 2014, and June 13, 2018, respectively.

Under the National Environmental Policy Act of 1969 (NEPA), an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor operating license; 10 CFR 51.95(c) states that the EIS prepared at the operating license renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437.^(a)

Upon acceptance of the SNC application, the NRC staff began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and to conduct scoping. The staff visited the HNP site in May 2000 and held public scoping meetings on May 10, 2000, in Vidalia, Georgia. The staff reviewed the SNC Environmental Report (ER) and compared it with the GEIS; consulted with Federal, State, and local agencies; conducted an independent review of the issues following the guidance set forth in *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*, NUREG-1555, Supplement 1; and considered the public comments received during the scoping process for preparation of the draft supplemental environmental impact statement (SEIS) for HNP. Two public meetings were held in Vidalia, Georgia, on December 12, 2000. During that time, the staff described the preliminary results of the NRC environmental review and were available to answer questions related to it in order to provide members of the public with information to assist them in formulating their comments. All of the comments received on the draft SEIS were considered by the staff in developing the final document and are presented in Appendix A, Part II.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Executive Summary

This SEIS includes the NRC staff's analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse effects. It also includes the staff's recommendation regarding the proposed action.

The Commission has adopted the following definition of purpose and need for license renewal from the GEIS:

The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether HNP continues to operate beyond the period of the current operating licenses.

The GEIS contains the results of a systematic evaluation of the consequences of renewing an operating license and operating a nuclear power plant for an additional 20 years. It contains a summary of the evaluation of 92 environmental issues using a three-level standard of significance—SMALL, MODERATE, or LARGE—based on Council on Environmental Quality guidelines. These significance levels are as follows:

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.

For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent-fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues are identified in the GEIS as Category 1 issues. In the absence of significant new information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, are not categorized. Environmental justice was not evaluated on a generic basis and must be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared. The status of this issue must also be addressed in a plant-specific supplement to the GEIS.

This SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that are considered include the no-action alternative (not renewing the HNP operating licenses) and alternative methods of power generation. Among the alternative methods of power generation, coal-fired and gas-fired generation appear to be the most likely if the power from HNP is replaced. These alternatives are evaluated assuming that the replacement power-generation plant is located at either the HNP site or an unspecified "greenfield" site (an undisturbed, pristine site).

SNC and the staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither SNC nor the staff has identified any significant new information related to Category 1 issues

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that would call into question the conclusions in the GEIS. Similarly, neither SNC nor the staff has identified any new issue applicable to HNP that has a significant environmental impact. Therefore, the staff relies upon the conclusions of the GEIS for all 69 Category 1 issues.

The staff has reviewed the SNC analysis for each Category 2 issue and conducted an independent review of each issue. Five Category 2 issues are not applicable to HNP because they are related to plant design features or site characteristics not found at HNP. Four Category 2 issues are not discussed in this SEIS because they are specifically related to refurbishment. Five additional Category 2 issues and environmental justice apply to both refurbishment and to operation during the renewal term and are only discussed in relation to operation during the renewal term. SNC has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications necessary to support the continued operation of HNP beyond the end of the existing operating licenses. In addition, routine replacement of components or additional inspection activities are within the bounds of normal plant component replacement and, therefore, are not expected to affect the environment outside of the bounds of the plant operations evaluated in the final environmental statements for HNP.

Twelve Category 2 issues, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this SEIS. For all 12 Category 2 issues and environmental justice, the staff concludes that the potential environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff concluded that a consensus has not been reached by appropriate Federal health agencies that there are adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs and that none of the candidate SAMAs is cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted. In addition, no new issues that were not considered in the GEIS have been identified.

In the event that the HNP operating licenses are not renewed and the units cease operation on or before the expiration of their current operating licenses, the adverse impacts of likely alternatives will not be smaller than those associated with continued operation of HNP. The impacts may, in fact, be greater in some areas.

The NRC staff recommends that the Commission determine that the adverse environmental impacts of license renewal for HNP are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2) the ER submitted by SNC; (3) consultation with other Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments.

Abbreviations/Acronyms

AC	alternating current
ACC	averted cleanup and decontamination costs
ADAMS	Agencywide Document Access Management System
AEA	Atomic Energy Act of 1954
AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
ALI	annual limit on intake
AOC	averted offsite property damage costs
AOE	averted occupational exposure
AOSC	averted onsite costs
APE	averted public exposure
ATWS	Anticipated Transient Without Scram
BTU	British thermal unit
BWR	boiling-water reactor
CAA	Clean Air Act
CDF	core damage frequency
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeter
CoE	U.S. Army Corps of Engineers
COE	cost of enhancement
CWA	Clean Water Act
DAC	derived air concentration
DBA	design-basis accident
DC	direct current
DOE	U.S. Department of Energy
EIA	Energy Information Administration (of DOE)
EIS	environmental impact statement
ELF-EMF	extremely low frequency-electromagnetic field
EPA	U.S. Environmental Protection Agency
EPD	Environmental Protection Division (of GADNR)
EPRI	Electric Power Research Institute
ER	Environmental Report
ESA	Endangered Species Act of 1973

Abbreviations/Acronyms

ESRP	Environmental Standard Review Plan, NUREG-1555, Supplement 1, Operating License Renewal
FERC	Federal Energy Regulatory Commission
FES	final environmental statement
FR	Federal Register
ft	feet
FWPCA	Federal Water Pollution Control Act (also known as the Clean Water Act of 1977)
FWS	U.S. Fish and Wildlife Service
GADNR	Georgia Department of Natural Resources
GDA	Georgia Department of Audits
GDCA	Georgia Department of Community Affairs
GDL	Georgia Department of Labor
GEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437
GOPB	Georgia Office of Planning and Budget
GPC	Georgia Power Company
gpd	gallons per day
gpm	gallons per minute
GTC	Georgia Transmission Company
ha	hectare
HEPA	high-efficiency particulate air (filter)
HLW	high-level waste
HNP	Edwin I. Hatch Nuclear Plant
HPCI	high-pressure coolant injection
in.	inch
IPA	integrated plant assessment
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination for External Events
ISLOCA	Interfacing System Loss of Coolant Accident
kg	kilogram
km	kilometer
kV	kilovolt
kWh	kilowatt hour

L	liter
LERF	Large Early Release Frequency
LOCA	loss-of-coolant accident
m ³ /d	cubic meters per day
mA	milliampere
MAAP	Modular Accident Analysis Program
m	meter
MACCS	Melcor Accident Consequence Code System
mi	mile
min	minute
mrem	special unit of radiation dose equivalent, equal to 0.001 rem
MTHM	metric tonnes of heavy metal
MT	metric ton (or tonne)
MTU	metric ton-uranium
MW	megawatt
MW(e)	megawatt electric
MW(t)	megawatt thermal
MWh	megawatt hour
MWd/MTU	megawatt-days per metric ton of uranium
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act of 1969
NESC	National Electric Safety Code
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NO _x	nitrogen oxide(s)
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OL	operating license
PARS	Publicly Available Records (a component of ADAMS)
PM ₁₀	particulate matter, 10 microns or less in diameter
ppm	parts per million
PRA	Probabilistic Risk Assessment
PSA	Probabilistic Safety Assessment
PSW	plant service water

Abbreviations/Acronyms

RAI	request for additional information
RCRA	Resource Conservation and Recovery Act
rem	special unit of dose equivalent, equivalent to 0.01Sv
REMP	radiological environmental monitoring program
RPC	replacement power cost
ry	reactor year
SAMA	Severe Accident Mitigation Alternative
SEIS	supplemental environmental impact statement
SNC	Southern Nuclear Operating Company
SO ₂	sulfur dioxide
SO _x	sulfur oxide(s)
STI	Southeastern Technical Institute
Sv	Sievert, metric unit of dose equivalent
TCDA	Toombs County Development Authority
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture

1.0 Introduction

Southern Nuclear Operating Company (SNC) operates the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, in Appling County, Georgia, under operating licenses (OLs) DPR-57 and NPF-5 issued by the U.S. Nuclear Regulatory Commission (NRC). These OLs will expire on August 6, 2014, and June 13, 2018, respectively. By letter dated February 29, 2000, SNC submitted an application to the NRC to renew the HNP OLs for an additional 20 years under Title 10 of the Code of Federal Regulations (CFR) Part 54. SNC is a *licensee* for the purposes of its current OLs and an *applicant* for the renewal of the OLs. HNP is co-owned by Georgia Power Company (GPC), Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the city of Dalton, Georgia. Southern Company, based in Atlanta, Georgia, is the parent company of SNC. SNC provides services to Southern Company's nuclear power plants. Southern Company is also the parent company of five electric utilities, including GPC.

The National Environmental Policy Act (NEPA) requires an environmental impact statement (EIS) for major Federal actions significantly affecting the quality of the human environment. As provided in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999),^(a) under NRC's environmental protection regulations in 10 CFR Part 51 implementing NEPA, renewal of a nuclear power plant operating license is identified as a major Federal action significantly affecting the quality of the human environment. Therefore, an EIS is required for a plant license renewal review. The EIS requirements for a plant-specific license renewal review are specified in 10 CFR Part 51. Pursuant to 10 CFR 54.23 and 51.53(c), SNC submitted an Environmental Report (ER; SNC 2000a) in which SNC analyzed the environmental impacts associated with the proposed action, considered alternatives to the proposed action, and evaluated any alternatives for reducing adverse environmental effects.

As part of NRC's evaluation of the application for license renewal, the NRC staff is required under 10 CFR Part 51 to prepare an EIS for the proposed action, issue the statement in draft form for public comment, and issue a final statement after considering public comments on the draft. This report is the final plant-specific supplement to the GEIS (supplemental environmental impact statement [SEIS]) for the SNC license renewal application for HNP, Units 1 and 2. The EIS is a supplement to the GEIS because it relies in part on the findings of the GEIS. The staff will also prepare a separate safety evaluation report in accordance with 10 CFR Part 54.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Introduction

The following sections of this introduction describe the background and the process used by the staff to assess the environmental impacts associated with license renewal, describe the proposed Federal action, discuss the purpose and need for the proposed action, and present the status of compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies that have responsibility for environmental protection. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 and 4 discuss the potential environmental impacts of plant refurbishment and plant operation during the renewal term, respectively. Chapter 5 contains an evaluation of potential environmental impacts of plant accidents and includes consideration of severe accident mitigation alternatives. Chapter 6 discusses the uranium fuel cycle and solid waste management, and Chapter 7 discusses decommissioning. The alternatives to license renewal are considered in Chapter 8. Finally, Chapter 9 summarizes the findings of the prior chapters, draws conclusions related to the adverse impacts that cannot be avoided (the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and the irreversible or irretrievable commitments of resources), and presents the recommendation of the staff with respect to the proposed action. Additional information is included in Appendices. Appendix A contains a discussion of comments obtained during the public scoping meetings and the public meetings held to discuss the draft SEIS. Appendix B lists preparers of this supplement, and Appendix C lists the chronology of correspondence between NRC and SNC with regard to this supplement. The remaining appendices are identified in subsequent sections.

Generic Environmental Impact Statement

The NRC initiated a generic assessment of the environmental impacts associated with the license renewal term to improve the efficiency of the license renewal process by documenting the assessment results and codifying the results in the Commission's regulations. This assessment is provided in the GEIS, which serves as the principal reference for all nuclear power plant license renewal EISs.

The GEIS documents the results of the systematic approach that was taken to evaluate the environmental consequences of renewing the licenses of individual nuclear power plants and operating them for an additional 20 years. For each potential environmental issue, the GEIS (1) described the activity that affects the environment, (2) identified the population or resource that is affected, (3) assessed the nature and magnitude of the impact on the affected population or resource, (4) characterized the significance of the effect for both beneficial and adverse effects, (5) determined whether the results of the analysis applied to all plants, and (6) considered whether additional mitigation measures would be warranted for impacts that would have the same significance level for all plants.

The NRC established its standard of significance using the Council on Environmental Quality (CEQ) terminology for “significantly” (40 CFR 1508.27) for assessing environmental issues. Using the CEQ guidelines, the NRC established three significance levels, as follows:

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.

The GEIS assigned a significance level to each environmental issue, assuming that ongoing mitigation measures would continue.

The GEIS included a determination of whether the analysis of the environmental issue could be applied to all plants, and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, **Category 1** issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

Introduction

In the GEIS, the staff assessed 92 environmental issues and determined that 69 qualified as Category 1 issues, 21 qualified as Category 2 issues, and 2 issues were not categorized. The latter two issues, environmental justice and chronic effects of electromagnetic fields, are to be addressed in a plant-specific analysis. Of the 92 issues, 10 are related to refurbishment, 74 are related to operations during the renewal term, and 8 apply to both refurbishment and operation during the renewal term. A summary of the findings for all 92 issues of the GEIS is codified in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

License Renewal Evaluation Process

An applicant seeking to renew its OL is required to submit an ER as part of its application. This ER must provide an analysis of the issues listed as Category 2 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 in accordance with 10 CFR 51.53(c)(3)(ii). The ER must include a discussion of actions to mitigate adverse impacts associated with the proposed action and environmental impacts of alternatives to the proposed action. In accordance with 10 CFR 51.53(c)(2), the ER need not consider the economic benefits and costs of the proposed action and alternatives to the proposed action except insofar as such benefits and costs are either essential for determination of whether an alternative should be included in the range of alternatives considered, or relevant to mitigation. Section 51.53(c)(2) also provides that certain other issues, including the need for power and other issues not related to the environmental effects of the proposed action, need not be considered in the ER. In addition, the ER need not discuss any aspect of the storage of spent fuel within the scope of the generic determination in 10 CFR 51.23(a) in accordance with 10 CFR 51.23(b). Pursuant to 10 CFR 51.53(c)(3)(iii) and (iv), the ER is not required to contain an analysis of any Category 1 issues unless there is significant new information on a specific issue. New and significant information is (1) information that identifies a significant environmental issue not covered in the GEIS and codified in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, or (2) information that was not considered in the analyses summarized in the GEIS and that leads to an impact finding different from that codified in 10 CFR Part 51.

In preparing to submit its application to renew the HNP OLs, SNC developed a process to ensure that new and significant information regarding the environmental impacts of license renewal for HNP would be properly reviewed before submitting the ER and to ensure that new and significant information related to renewal of the HNP licenses would be identified, reviewed, and addressed during the period of NRC review. SNC reviewed the Category 1 issues appearing in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, to verify that the conclusions of the GEIS remained valid with respect to HNP. This review was performed by personnel from SNC's Corporate Environmental Services Organization and HNP staff.

The NRC staff also has a process for identifying new and significant information. That process is described in detail in *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (ESRP), NUREG-1555, Supplement 1 (NRC 2000a). The search for new information includes a review of an applicant's ER and process for discovering and evaluating the significance of new information; review of records of public meetings and correspondence; review of environmental quality standards and regulations; coordination with Federal, State, and local environmental protection and resource agencies; and review of the technical literature. Any new information discovered by the staff is evaluated for significance using the criteria set forth in the GEIS. For Category 1 issues where new and significant information is identified, reconsideration of the conclusions for those issues is limited in scope to the assessment of the relevant new and significant information; the scope of the assessment does not include other facets of the issue that are not affected by the new information. Neither SNC nor the staff has identified any new issue applicable to HNP that has a significant environmental impact.

Chapters 3 through 7 discuss the environmental issues considered in the GEIS that are applicable to HNP. At the beginning of the discussion of each set of issues, there is a table that identifies the issues to be addressed and lists the sections in the GEIS where the issues are discussed. Category 1 and Category 2 issues are listed in separate tables. For Category 1 issues for which there is no new and significant information, the table is followed by a set of short paragraphs that state the GEIS conclusion codified in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, followed by the staff's analysis and conclusion. For Category 2 issues, in addition to the list of GEIS sections where the issue is discussed, the tables list the subparagraph of 10 CFR 51.53(c)(3)(ii) that describes the analysis required and the SEIS sections where the analysis is presented. The SEIS sections that discuss the Category 2 issues are listed immediately following the table.

The NRC prepares an independent analysis of the environmental impacts of license renewal as well as a comparison of those impacts with the environmental impacts of alternatives to license renewal. The evaluation of SNC's license renewal application began with publication of a notice of acceptance for docketing and opportunity for a hearing in the *Federal Register* (65 FR 17543, April 3, 2000). The staff then published a notice of intent to prepare an EIS and to conduct scoping (65 FR 19797, April 12, 2000).

Two public scoping meetings were held on May 10, 2000, in Vidalia, Georgia. The comments received during the scoping meeting and comment period are summarized in the *Environmental Impact Statement Scoping Process, Hatch Nuclear Station, Units 1 and 2, Summary Report*, August 23, 2000 (NRC 2000b).

Introduction

The staff visited the HNP site on May 10 and 11, 2000, reviewed the comments received during scoping, and consulted with Federal, State, regional, and local agencies. A list of the organizations consulted is provided in Appendix D of this document. Other documents related to HNP were also reviewed and are referenced.

- | The staff followed the review guidance contained in the ESRP. The staff issued requests for additional information to SNC by letters dated May 30, 2000 (NRC 2000c) and June 23, 2000 (NRC 2000d). SNC provided its responses in letters dated July 26, August 11, and August 31, 2000 (SNC 2000b, 2000c, and 2000d). The staff reviewed this information and incorporated it into its analysis. The results of the staff evaluation and its recommendation are contained in this SEIS.
- | On the date of publication of the U.S. Environmental Protection Agency Notice of Filing of the draft SEIS (November 9, 2000), a 75-day comment period commenced, during which members of the public could comment on the preliminary results of the NRC staff's review. During this comment period, two public meetings were held in Vidalia, Georgia, on December 12, 2000. During these meetings, the staff described the preliminary results of the NRC environmental review and was available to answer questions related to it to provide members of the public with information to assist them in formulating their comments. The comment period for the HNP draft SEIS ended January 24, 2001.
- | This SEIS presents the staff's analysis that considers and weighs the environmental effects of the proposed renewal of the HNP licenses, the environmental impacts of alternatives to license renewal, and alternatives available for avoiding adverse environmental effects. The staff considered the comments that were received during the comment period, and the disposition of the comments is addressed in Appendix A of this final SEIS. The staff modified the analysis set forth in the draft SEIS to address certain comments, as appropriate. A vertical bar in the margin indicates where the staff made changes to the draft SEIS. In addition, Chapter 9, Summary and Conclusions, provides the NRC staff's final recommendation to the Commission on whether the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

1.1 The Proposed Federal Action

- The proposed Federal action is renewal of the OLs for HNP, Units 1 and 2. HNP is located in Appling County, Georgia, approximately 18 km (11 mi) north of Baxley, Georgia. The plant has two boiling-water reactors, each with a design rating for a net electrical power output of
- | 860 megawatts (MW[e]). Plant cooling is provided by a cooling-tower heat dissipation system. The current OL for Unit 1 expires on August 6, 2014, and for Unit 2 on June 13, 2018. By letter

dated February 29, 2000 (SNC 2000a), SNC submitted an application to renew these OLs for an additional 20 years of operation (i.e., until August 6, 2034, for Unit 1 and June 13, 2038, for Unit 2).

1.2 Purpose and Need for the Action

A licensee must have a renewed license to operate a plant beyond the term of the existing OL. However, the possession of this license is just one of a number of conditions that must be met for the licensee to continue plant operation during the term of the renewed license. Once an OL is renewed, State regulatory agencies and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners.

Thus, for license renewal reviews, the Commission has adopted the following definition of purpose and need (GEIS, Section 1.3):

The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and where authorized, Federal (other than NRC) decision makers.

This definition of purpose and need reflects the Commission's recognition that, unless there are findings in the safety review required by the Atomic Energy Act of 1954, as amended, or findings in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC does not have a role in the energy-planning decisions of State regulators and utility officials as to whether a particular nuclear power plant should continue to operate. From the perspective of the licensee and the State regulatory authority, the purpose of renewing an OL is to maintain the availability of the nuclear plant to meet system energy requirements beyond the current term of the plant's license.

1.3 Compliance and Consultations

SNC is required to hold certain Federal, State, and local environmental permits, as well as meet relevant Federal and State statutory requirements. SNC provided a list in its ER of the status of authorizations from Federal, State, and local authorities for current operations as well as environmental approvals and consultations associated with HNP license renewal. Authorizations most relevant to the proposed license renewal action are summarized in Table 1-1.

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The staff reviewed the list and has consulted with the appropriate Federal, State, and local agencies to identify any compliance or permit issues or significant environmental issues of concern to the reviewing agencies. These agencies did not identify any new and significant environmental issues. Correspondence related to these consultations is provided in Appendix E. The staff has also not identified any new and significant environmental issues.

Table 1-1. Federal, State, and Local Authorizations

Agency	Authority	Requirement	License Permit Number	Permit Expiration or Consultation Date	Activity Covered	
NRC	Atomic Energy Act, 10 CFR Part 50	Operating license	DPR-57 (Unit 1) NPF-5 (Unit 2)	August 6, 2014 (Unit 1) June 13, 2018 (Unit 2)	Operation of HNP, Units 1 and 2	
FWS and NMFS	Endangered Species Act, Section 7	Consultation Informal consultation	NA	Consultation initiated by NRC August 31, 2000	Operation during the renewal term	
EPA and GADNR	Clean Air Act, Section 112	State air quality permit	4911-001-0001-V-01-0	February 4, 2004	Air quality permit	
EPA and GADNR	Safe Drinking Water Act, 42 U.S.C. 300f	State drinking water quality	PG0010005 and NG0010011	March 31, 2009	SNC has a drinking water permit for two wells and a separate permit for a third well	
GADNR	Georgia Water Quality Control Act	State surface water withdrawal	001-0690-01	January 1, 2010	Authorized withdrawal of Altamaha River water for cooling water	
EPA and GADNR	FWPCA (33 U.S.C.) Section 402	State storm water discharge permit	GAR000000	May 31, 2003	General storm water permit	
EPA and GADNR	FWPCA (33 U.S.C.) Section 402	State NPDES discharge permit	GA0004120	August 31, 2002	Discharges of process waste water (NPDES permit)	
EPA and GADNR	RCRA Section 3005	State solid waste landfill	001-004 D(L)(I)	Upon closure	Part A Hazardous Waste Permit, Interim Storage Facility for Mixed Wastes	
GADNR	National Historic Preservation Act, Section 106	Consultation	NA	Licensee consulted with GADNR, completed October 29, 1999	Operation during the renewal term	
EPA - U.S. Environmental Protection Agency FWPCA - Federal Water Pollution Control Act (also known as the Clean Water Act) FWS - U.S. Fish and Wildlife Service GADNR - Georgia Department of Natural Resources NMFS - National Marine Fisheries Service NPDES - National Pollutant Discharge Elimination System RCRA - Resource Conservation and Recovery Act NA - Not applicable						

1.4 References

10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

10 CFR 51.23, "Temporary storage of spent fuels after cessation of reactor operation - generic determination of no significant environmental impact."

10 CFR 51.53(c), "Operating license renewal stage."

10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

10 CFR 54.23, "Contents of application - environmental information."

40 CFR 1508.27, "Terminology and Index - Significantly."

65 FR 17543, "Notice of Acceptance for Docketing of the Application, and Notice of Opportunity for a Hearing Regarding Renewal of Licenses Nos. DPR-57 and NPR-5, for an Additional Twenty-Year Period." April 3, 2000.

65 FR 19797, "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process." April 12, 2000.

Atomic Energy Act of 1954, as amended, 42 USC 2011, et seq.

Clean Air Act (CAA), as amended, 42 USC 7401, et seq.

Endangered Species Act of 1973, as amended, 16 USC 1531, et seq.

Federal Water Pollution Control Act (FWPCA) of 1977, as amended, 33 USC 1251, et seq. (also known as the Clean Water Act).

Georgia Water Quality Control Act, Georgia Law 1964, et seq.

National Environmental Policy Act (NEPA) of 1969, as amended, 42 USC 4321, et seq.

National Historic Preservation Act of 1966, as amended, 16 USC 470, et seq.

Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 USC 6901, et seq.

Safe Drinking Water Act of 1974, as amended, 42 USC 300f, et seq.

Southern Nuclear Operating Company (SNC). 2000a. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage, Edwin I. Hatch Nuclear Plant.*

Southern Nuclear Operating Company (SNC). 2000b. Letter from Mr. H. L. Sumner, Jr., Southern Nuclear Operating Company to U.S. Nuclear Regulatory Commission. Subject: Edwin I. Hatch Nuclear Plant, Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives (TAC Nos. MA8096 and MA8098). July 26, 2000.

Southern Nuclear Operating Company (SNC). 2000c. Letter from Mr. H. L. Sumner, Jr., Southern Nuclear Operating Company to U.S. Nuclear Regulatory Commission. Subject: Edwin I. Hatch Nuclear Plant, Additional Information Related to the Staff's Review of the License Renewal Environmental Report (TAC Nos. MA8096 and MA8098). August 11, 2000.

Southern Nuclear Operating Company (SNC). 2000d. Letter from Mr. H. L. Sumner, Jr., Southern Nuclear Operating Company to U.S. Nuclear Regulatory Commission. Subject: Edwin I. Hatch Nuclear Plant, Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives (TAC Nos. MA8096 and MA8098). August 31, 2000.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437, Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000a. Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal. NUREG-1555, Supplement 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000b. *Environmental Impact Statement Scoping Process, Hatch Nuclear Station, Units 1 and 2, Summary Report*. Washington, D. C. August 23, 2000.

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U.S. Nuclear Regulatory Commission (NRC). 2000c. Letter from Mr. James H. Wilson, U.S. NRC, to Mr. H. L. Sumner, Jr., Southern Nuclear Operating Company. Subject: Request for Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. May 30, 2000.

U.S. Nuclear Regulatory Commission (NRC). 2000d. Letter from Mr. James H. Wilson, U.S. NRC, to Mr. H. L. Sumner, Jr., Southern Nuclear Operating Company. Subject: Request for Additional Information Related to the Staff's Review of the License Renewal Environmental Report for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. June 23, 2000.

2.0 Description of Nuclear Power Plant and Site and Plant Interaction with the Environment

The Edwin I. Hatch Nuclear Plant (HNP) is located in Appling County, Georgia, southeast of where U.S. Highway 1 crosses the Altamaha River. It is approximately 18 km (11 mi) north of Baxley, Georgia; 32 km (20 mi) south of Vidalia, Georgia; 160 km (98 mi) southeast of Macon, Georgia; 120 km (73 mi) northwest of Brunswick, Georgia; and 107 km (67 mi) southwest of Savannah, Georgia, as shown in Figure 2-1. HNP is a two-unit steam-electric generating plant. Each unit is equipped with a General Electric Nuclear Steam Supply System that uses a boiling-water reactor with a Mark I containment design. The plant uses a closed-loop cooling-tower system for main condenser cooling that withdraws makeup water from and discharges to the Altamaha River via shoreline intake and offshore discharge structures. The electricity generated is transferred to the switchyards located at the HNP site. Each unit is licensed for 2763 megawatts-thermal (MW[t]) and rated at 860 megawatts-electric (MW[e]), for a combined power output of 1720 MW(e).^(a) The amount of electricity produced by HNP can supply the needs of more than 540,000 homes. Descriptions of the plant and its environs follow in Section 2.1 and the plant's interaction with the environment is presented in Section 2.2.

2.1 Plant and Site Description and Proposed Plant Operation During the Renewal Term

HNP is jointly owned by Georgia Power Company (GPC), Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the city of Dalton, Georgia. The HNP site is located in a rural part of southeastern Georgia, and totals approximately 910 ha (2240 acres). The area is characterized by low, rolling sandy hills that are predominantly forested. Figure 2-1 shows the location of HNP in relationship to Georgia, South Carolina, and the Atlantic Ocean. Figure 2-2 shows the details of the 16-km (10-mi) region surrounding HNP. A property plan is shown in Figure 2-3. The property includes approximately 360 ha (900 acres) north of the Altamaha River in Toombs County and approximately 540 ha (1340 acres) south of the river in Appling County.

HNP lies on the southern shore of the Altamaha River, which runs eastward past the plant. The Altamaha is the largest river of the Georgia coast and the second largest basin in the eastern United States. Located in southeastern Georgia, the river drains an area of approximately 30,000 km² (11,600 mi²). It is formed by the confluence of the Ocmulgee and Oconee rivers about 32 km (20 mi) upstream from HNP and ultimately discharges into the Atlantic Ocean just south of Darien, Georgia, approximately 190 river km (117 river mi) downstream of HNP.

(a) For purposes of comparison of alternatives in Chapter 8, the staff conservatively used 1690 MW(e) as the net output for HNP based on actual generation data for HNP.

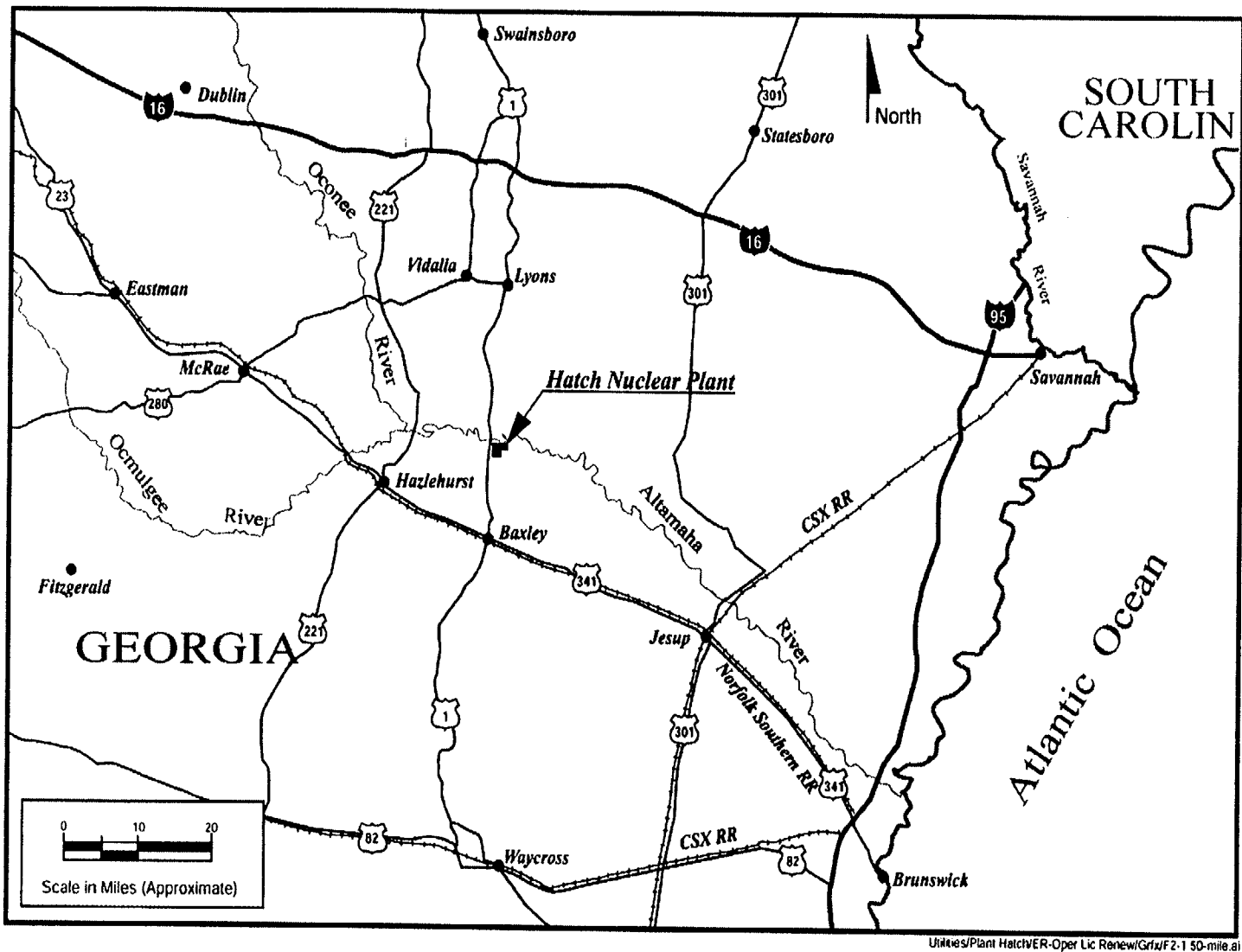


Figure 2-1. Location of Hatch Nuclear Plant in Southeast Georgia

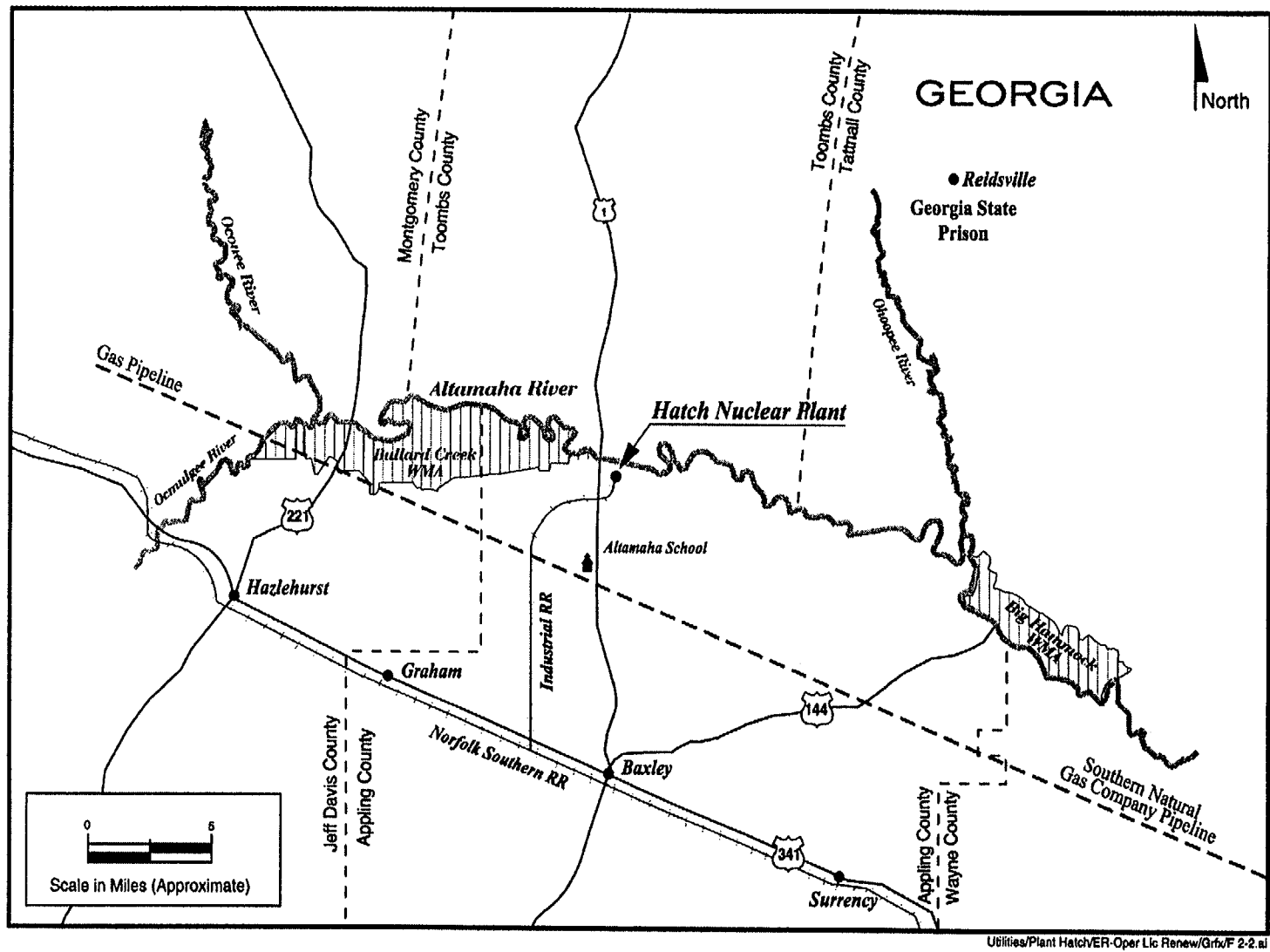


Figure 2-2. Region Surrounding Hatch Nuclear Plant

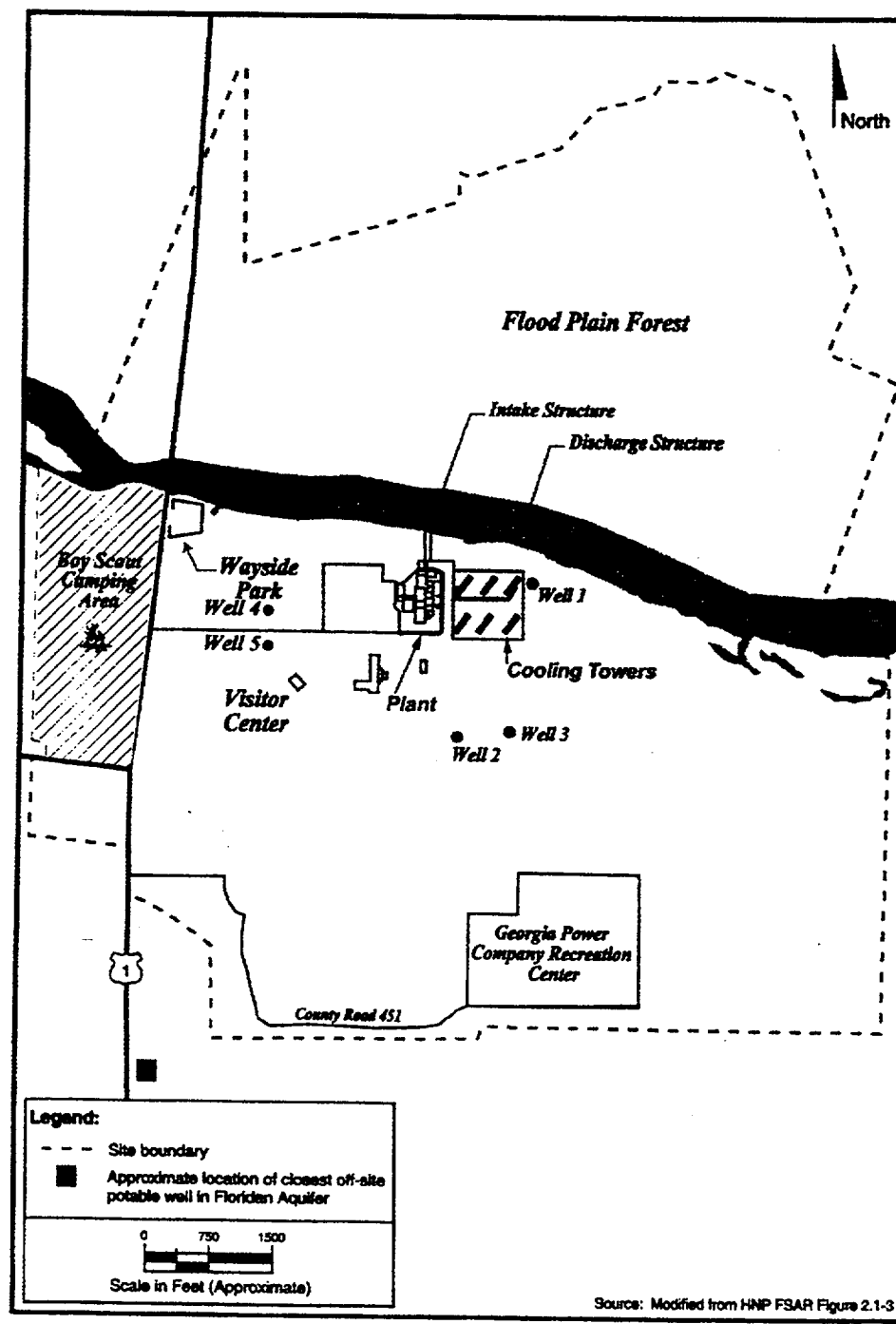


Figure 2-3. Hatch Nuclear Plant Property Plan

The region surrounding HNP was identified by the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999),^(a) as having a low population density. Approximately 975 persons make up the non-outage workforce at HNP. Up to an additional 800 workers are onsite during plant outages.

All industrial facilities associated with the site are located in Appling County. The restricted area, which comprises the reactors, containment buildings, switchyard, cooling-tower area, and associated facilities, is approximately 120 ha (300 acres) (Figure 2-4). Approximately 650 ha (1,600 acres) are managed for timber production and wildlife habitat.

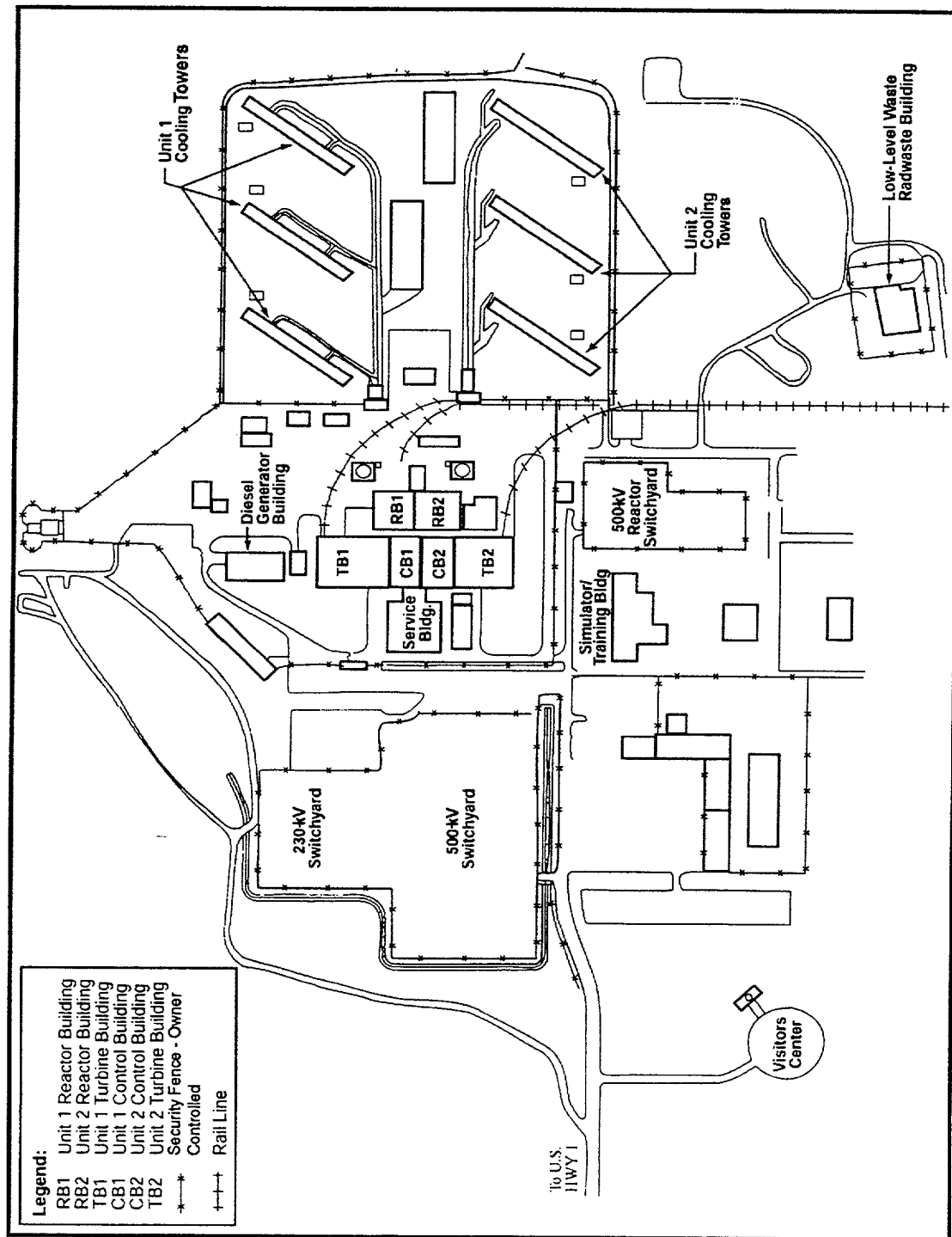
Controlled areas available for use with prior permission include 30 ha (75 acres) of wetlands wildlife habitat area and a 40-ha (100-acre) tract of land west of U.S. Highway 1 (Figure 2-3) used as a Boy Scout camp. Uncontrolled areas available to the public include a wayside park, a recreation area, and Visitors Center (Figure 2-3).

HNP is one of three nuclear plants operated by the Southern Nuclear Operating Company (SNC). The others are the Joseph M. Farley Nuclear Plant and the Alvin W. Vogtle Electric Generating Plant. Combined, these three plants provide over 20 percent of the electricity used in Georgia and Alabama. Construction of HNP Unit 1 began in 1968, and commercial operation began in December 1975. Unit 2 construction began in 1972 and commercial operation began in September 1979. GPC constructed the units and had sole responsibility for their operation until March 21, 1997, at which time SNC became the exclusive operating licensee.

2.1.1 External Appearance and Setting

The main generating facilities at HNP (including reactor buildings, turbine buildings, and control buildings) are relatively unobtrusive, neutral-colored buildings, but are visible from portions of U.S. Highway 1 and from the adjacent reach of the Altamaha River. The central area of HNP consists of the two reactor buildings, two control buildings, and two turbine buildings clustered in the center. Around the perimeter are the cooling towers and switchyards. Various other buildings and facilities are located at HNP to support the plant (Figures 2-4 and 2-5). The existing HNP reactor building and single main exhaust stack are approximately 61 m (200 ft) and 120 m (393 ft) tall, respectively. The mechanical draft cooling towers are approximately 18 m (60 ft) tall.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.



Utilities Plant Hatch/ER Oper Le Renew/Grnt/F2.4 Gen Layout El Hatch Nuc Plant

Figure 2-4. Hatch Nuclear Plant Site Plan

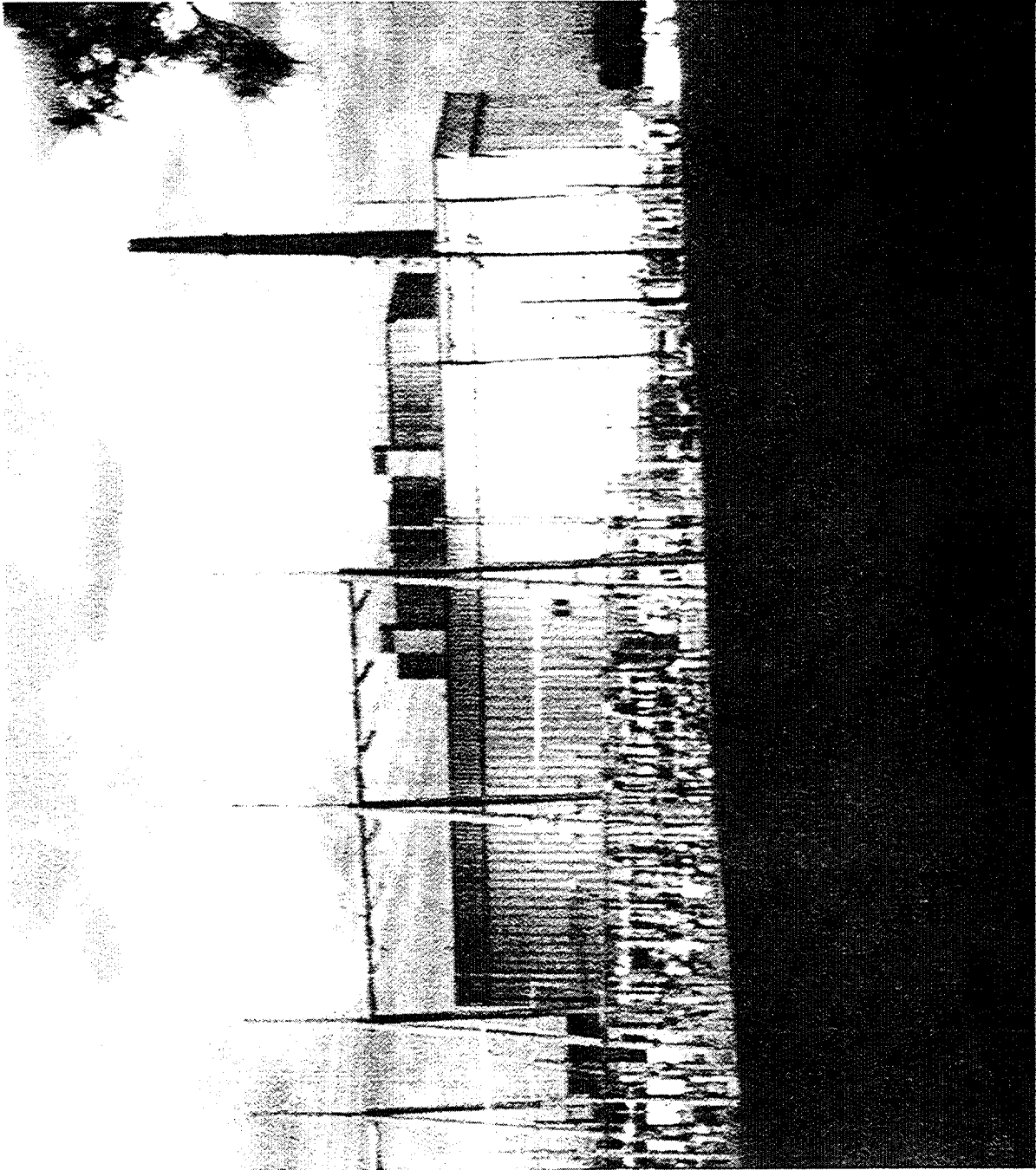


Figure 2-5. Hatch Nuclear Plant

Plant and the Environment

HNP stores its spent nuclear fuel onsite in a spent fuel pool and in dry storage casks. The dry storage pad has room for up to 48 dry storage casks.

In addition to the restricted operations facilities, areas controlled by GPC include a wetlands wildlife habitat area and a Boy Scout camp. The wetlands have been certified as wildlife habitat since 1994 by the Wildlife Habitat Council. A lease agreement with the Area Council of the Boy Scouts of America allows scouting groups to use the Boy Scout Camping Area. In the past, the area has been used on weekends by scouts, with the number using the area ranging between 25 and 50 per weekend. The area may be used in the future for Boy Scout Camporees that involve as many as 400 to 500 scouts.

Uncontrolled areas available to the public include a wayside park, a recreation area, and a Visitors Center. The wayside park, east of U.S. Highway 1 and south of the river, provides simple recreational facilities overlooking the Altamaha River. The area has parking and picnicking facilities, and can accommodate up to 10 groups at a time. The 5.3-ha (13-acre) GPC Recreation Area includes softball fields, tennis courts, an archery range, a swimming pool, and an office building that houses a multipurpose activities room. The Visitors Center is reached from the main plant access road that originates at U.S. Highway 1. The Visitors Center houses hands-on exhibits on nuclear power and exhibits depicting the history of nuclear power, the history of HNP, and an environmental exhibit featuring the Altamaha River. The Visitors Center also houses conference rooms and an auditorium that seats approximately 70 people. The typical number of visitors is approximately 50 daily and 12,000 annually.

The HNP site lies within the Coastal Plain physiographic province and is underlain by approximately 1200 m (4000 ft) of relatively unconsolidated Mesozoic and Cenozoic sand, gravel, clay, marl, claystone, sandstone, and limestone. These strata overlie basaltic basement rock of pre-Cretaceous age, and dip and thicken seaward. There was no evidence of faulting during the exploratory drilling and construction of the facility. The formations at the site, of interest due to their water-bearing characteristics, consist of the alluvium beneath the Altamaha River floodplain, the Brandywine Formation (the perched aquifer), the Hawthorn Formation, the Tampa Formation, the Suwanee Formation, the Ocala Formation, and the Lisbon Formation. The Brandywine Formation caps the upland areas adjacent to the stream drainage areas.

The perched water aquifer at the site (Brandywine) is approximately 3 m (10 ft) thick. This aquifer is recharged through direct precipitation. A few springs exist approximately 2.4 km (1.5 mi) southwest of the site at the base of the Brandywine Formation. Discharge is to the ground surface or to streams that have cut through the confining layer at the base of the formation. These springs are dry during droughts. No permeability or safe-yield data are available for this aquifer.

The water table in the unconfined aquifer is the surficial unit south of the Altamaha River. This aquifer unit is 14 to 15 m (45 to 50 ft) thick and yields less than 38 L/min (10 gpm). The water table reflects the topography of the site area. High water levels underlie the surrounding hills and low water levels are near valleys. The flow direction beneath the plant site is north and east toward the Altamaha River floodplain, along gradients ranging from 4 to 24 m/km (14 to 80 ft/mi). High-clay-content soils near the top of the aquifer and at the ground surface locally form a discontinuous, relatively impermeable zone. Recharge to the unconfined aquifer is by the infiltration of precipitation through and around the leaky clay zones.

The minor confined aquifer is recharged locally in the southwest portion of the site where the middle portion of the Hawthorn Formation is exposed. Natural discharge of the aquifer takes place where the aquifer comes into contact with the alluvium of the Altamaha River. Permeability of the aquifer increases with depth. The potentiometric surface of the aquifer has a gradient of 7 m/km (23 ft/mi) to the north, toward the Altamaha River. The aquifer unit is approximately 20 m (65 ft) thick and can yield up to 38 L/d (10 gpd). A confining unit separates the minor confined aquifer from the underlying aquifer.

The principal artesian aquifer (Floridan) beneath the site is approximately 305 m (1000 ft) thick. It is the major aquifer of interest. Recharge to the aquifer is about 97 km (60 mi) northwest of the site at the outcrop area for the formations that comprise the aquifer. The potentiometric surface of the aquifer slopes gently to the southeast beneath the site. The aquifer is isolated from the overlying aquifers and this prevents a downward migration of groundwater.

Within the immediate vicinity of HNP, the primary use of groundwater is for domestic needs, with a limited amount for livestock. Most domestic wells are screened within the unconfined aquifer. The closest offsite well that is screened to the principal aquifer is located approximately 305 m (1000 ft) southwest of the site (Figure 2-3). Currently, there is no industrial demand for groundwater within the vicinity of the site, and no groundwater is used for irrigation. The nearest appreciable demand is 16 km (10 mi) south of the site, where the town of Baxley has four wells withdrawing approximately 5300 m³/d (1.4 million gallons per day [gpd]) from the principal aquifer.

2.1.2 Reactor Systems

The two HNP reactors are boiling-water reactors operated by SNC with steam-electric turbines manufactured by General Electric Company. Both units were originally rated at 2436 MW(t) and designed for a power level corresponding to approximately 2537 MW(t). Each unit is now licensed to operate at a maximum core thermal power output level of 2763 MW(t) (63 FR 53473). Each unit is rated for a net electrical output of 860 MW(e).

HNP fuel is slightly enriched (currently 3.8 percent uranium-235 by weight, with an anticipated increase to 4.2 percent by weight) uranium dioxide in the form of high-density ceramic pellets. Each fuel rod consists of fuel pellets stacked in a Zircaloy-2 cladding tube, which is evacuated, back-filled with helium, and sealed by welding Zircaloy plugs in each end. SNC currently operates HNP at an equilibrium core average fuel discharge burnup rate of 42,100 megawatt-days per metric ton uranium (MWd/MTU), and plans to operate at 45,000 MWd/MTU in the future.

Reactor containment structures are designed with engineered safety features to protect the public and plant personnel from an accidental release of radioactive fission products, particularly in the unlikely event of a loss-of-coolant accident (LOCA). These safety features function to localize, control, mitigate, or terminate such events to limit exposure levels to below applicable dose guidelines. The reactor is controlled using control rods containing a neutron absorber material and by controlling the flow rate through the reactor.

2.1.3 Cooling and Auxiliary Water Systems

HNP withdraws groundwater for potable and process use from the Floridan Aquifer and surface water from the Altamaha River for cooling-tower makeup water. The excess heat produced by HNP's two nuclear units is absorbed by cooling water flowing through the condensers and the service water system. Main condenser cooling is provided by mechanical draft cooling towers. Each HNP circulating-water system is a closed-loop cooling system that uses one counter-flow and three cross-flow cooling towers for dissipating waste heat to the atmosphere. The cooling water does not come into contact with the water that passes through the reactor.

Cooling-tower makeup water is withdrawn from the Altamaha River through a single intake structure. The intake structure is located along the shoreline of the Altamaha River and is positioned so that water is available to the plant at both minimum flow and probable flood conditions. The intake is approximately 46 m (150 ft) long, 18 m (60 ft) wide, and the roof is approximately 18 m (60 ft) above normal river level. To account for varying river stages, the water passage entrance extends from 4.6 m (16 ft) below to 10 m (33 ft) above normal water levels.

Water is returned to the Altamaha River via a submerged discharge structure that consists of two 107-cm (42-in.) lines extending 37 m (120 ft) out from the south shore at an elevation of 17 m (54 ft) mean sea level. The point of discharge is 380 m (1260 ft) downriver from the intake structure and approximately 1.2 m (4 ft) below the surface when the river is at its lowest level.

2.1.4 Radioactive Waste Management Systems and Effluent Control Systems

HNP uses liquid, gaseous, and solid radioactive waste management systems to collect and treat the radioactive materials that are produced as a by-product of plant operations. These systems reduce radioactive liquid, gaseous, and solid effluents to levels as low as reasonably achievable (ALARA) before they are released to the environment. The HNP waste processing systems meet the design objectives of 10 CFR Part 50, Appendix I, and control the processing, disposal, and release of radioactive liquid, gaseous, and solid wastes. Radioactive material in the reactor coolant is the primary source of gaseous, liquid, and solid radioactive wastes in light-water reactors. Radioactive fission products build up within the fuel as a consequence of the fission process. These fission products are contained in the sealed fuel rods, but small quantities escape the fuel rods and contaminate the reactor coolant. Neutron activation of the primary coolant system is also responsible for coolant contamination.

Non-fuel solid wastes result from treating and separating radionuclides from gases and liquids and from removing contaminated material from various reactor areas. Solid wastes also consist of reactor components, equipment, and tools removed from service, as well as contaminated protective clothing, paper, rags, and other trash generated from plant design and operations modifications and routine maintenance activities. Solid wastes are shipped to a waste processor for volume reduction before disposal or are sent directly to the licensed disposal facility. Spent resins and filters are dewatered and stored or packaged for shipment to licensed offsite processing or disposal facilities; currently, solid wastes are shipped to Barnwell, South Carolina.

Reactor fuel assemblies that have exhausted a certain percentage of their fissile uranium content are referred to as spent fuel. Spent fuel assemblies are removed from the reactor core and replaced by fresh fuel during routine refueling outages. HNP currently operates on an 18-month refueling cycle for its two units. The spent fuel assemblies are currently stored onsite in a spent fuel pool and in dry storage casks. The dry storage pad has space for up to 48 dry storage casks.

HNP also provides for accumulation and temporary onsite storage of mixed wastes, which contain both radioactive and chemically hazardous waste. Storage of radioactive material is regulated by the NRC under the Atomic Energy Act of 1954 (AEA), and accumulation and temporary storage of hazardous wastes is regulated by the U.S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act of 1976 (RCRA).

The HNP Offsite Dose Calculation Manual (ODCM) provides the methodology that the licensee uses to calculate offsite doses based on gaseous and liquid effluent releases from the plant. These releases are reported in the licensee's annual radioactive effluent release report, which

also includes the ODCM as an appendix if it is revised during the year covered by the report (Southern Company 2000a). The ODCM specifies the parameters to be used to calculate potential offsite doses due to radioactive liquid and gaseous effluents and to ensure compliance with the following limits:

- The concentration of radioactive liquid effluents released from the site to the unrestricted area will be limited to levels that meet regulatory requirements.
- The exposure to any individual member of the public from radioactive liquid effluents will not result in doses greater than the design objectives of 10 CFR Part 50, Appendix I.
- The exposure to any individual member of the public from radioactive gaseous effluents will not result in doses greater than the design objectives of 10 CFR Part 50, Appendix I.
- The dose to any individual member of the public from the nuclear fuel cycle will not exceed the limits in 40 CFR Part 190 and 10 CFR Part 20.
- The dose rate from radioactive gaseous effluents at any time at the site boundary will be limited to (a) less than or equal to 5 mSv/yr (500 mrem/yr) to the whole body and less than or equal to 30 mSv/yr (3000 mrem/yr) to the skin for noble gases, and (b) less than or equal to 15 mSv/yr (1500 mrem/yr) to any organ for iodine-131 and -133, tritium, and for all radioactive materials in particulate form with half-lives greater than 8 days.

The systems used for processing liquid waste, gaseous waste, and solid waste are described in the following sections.

2.1.4.1 Liquid Waste Processing Systems and Effluent Controls

HNP, Units 1 and 2, have separate liquid radwaste treatment systems and release waste to separate discharge lines. Based on the water source and process train, radioactive liquid wastes from the operation of HNP are accumulated in storage tanks (i.e., waste collector tank, floor drain collector tank, and chemical waste tank). These wastes are collected in the Auxiliary Building and transferred to the radwaste facility for processing by filtration or demineralization or both. The radwaste facility processes high-activity, low-activity, and chemical liquid wastes from the Auxiliary Building.

HNP liquid wastes are disposed of by one of the following three methods based on the concentration of radioactive material in the waste:

- collected, sampled, analyzed, and then discharged directly to the discharge line, which flows into the Altamaha River
- processed by filtration or demineralization or both, collected, sampled, and then released to a condensate storage tank for re-use as makeup water
- processed by filtration or demineralization or both, collected, sampled, analyzed with the filters or resins or both; and then dewatered, packaged, and shipped to a licensed disposal facility or an offsite vendor waste processor.

The actual liquid waste generated in 1999 is reported in the licensee's annual radioactive effluent release report (Southern Company 2000a). For 1999, approximately 19,500 m³ (688,000 ft³) of prediluted liquid waste were released, which is within the range of liquid wastes generated annually at other boiling-water reactors.

The ODCM prescribes the effluent release rate that will ensure that offsite doses attributable to radioactive liquid effluents released from the site to the unrestricted area satisfy regulatory requirements. In addition, the ODCM provides calculations for the radiation monitor alarm/trip set points that define the relationship between the measured effluent activity, the maximum allowable effluent activity, and the effluent flow rate needed to ensure that an instantaneous release rate is not exceeded as well.

2.1.4.2 Gaseous Waste Processing Systems and Effluent Controls

Radioactive gases are generated by fission and neutron activation of materials in the plant. Gaseous wastes are monitored and released to the atmosphere at a permissible rate prescribed by the ODCM to ensure compliance with regulatory limits. HNP has four continuously monitored gaseous discharge points. The discharge points are (1) the Unit 1 reactor building vent stack, (2) the Unit 2 reactor building vent stack, (3) the Unit 1 recombiner building vent, and (4) the main stack. The maximum flow rate for the reactor building vents (Units 1 and 2) is 140 m³/s (300,000 ft³/min) for each vent; 0.24 m³/s (500 ft³/min) for the Unit 1 recombiner building vent (there is no such vent for Unit 2); and 9.4 m³/s (20,000 ft³/min) for the main stack. The reactor building vent stack is the discharge point for the following release sources: reactor building, refueling floor ventilation, turbine building, and radwaste facility. The main stack is the discharge point from the following release sources from each unit: mechanical vacuum pumps, off-gas treatment system, gland seal exhaust, and standby gas treatment system. All release points except the main stack are considered ground-level releases. At a height of 120 m (393 ft), the main stack is considered an elevated release point. Each of the four release points is continuously monitored for radioactive material.

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The off-gas treatment system treats noncondensable off-gas that is continuously removed from the main condenser by air ejectors during plant operations. The gaseous effluent treated by this system is the major gaseous release source from the plant, larger than all others combined. The system uses catalytic recombination and charcoal adsorption. The major system components are located in the turbine building, in the offgas recombiner building, and in the waste gas treatment building. The catalytic recombiner recombines radiolytically dissociated hydrogen and oxygen from the air ejector system. Air cooling strips the condensable gases and reduces the volume of material to be released. The remaining noncondensable gases (e.g., krypton, xenon) are delayed in the hold-up system to permit additional radioactive decay prior to release. The off-gas then passes through a charcoal adsorber, which further reduces the off-gas activity. The off-gas is monitored as it exits the charcoal adsorber, passes through the high-efficiency particulate air (HEPA) filter, and is then released through the monitored main stack.

Other gaseous effluent releases may occur from the reactor building, turbine building, and radwaste building. These effluents are either treated by hold-up or filtration prior to being released through the Unit 1 or Unit 2 reactor building vent stack.

The ODCM prescribes the effluent release rate to ensure that releases are less than the regulatory limits. In addition, the ODCM provides the calculational methodology for the radiation monitor alarm/trip set points that defines the relationship between the measured effluent activity, the maximum allowable effluent activity, and the effluent flow rate to ensure that the instantaneous release rate is below the licensed limit. For 1999, no gaseous release limits were exceeded at HNP (Southern Company 2000a).

2.1.4.3 Solid Waste Processing and Handling

Solid low-level radioactive waste at HNP is generated by removal of radionuclides from liquid waste streams, filtration of airborne gaseous emissions, and removal of contaminated material from the plant. Concentrated liquids, filter sludges, waste oils, and other liquid sources are segregated by type, flushed to storage tanks, stabilized for packaging in a solid form by dewatering, slurried into an appropriate container (i.e., carbon steel or high-integrity container), and stored onsite until suitable for offsite disposal. HEPA filters are compacted in volume-reduction facilities and disposed of as solid wastes. Dry active waste includes contaminated protective clothing, paper, rags, glassware, trash, and non-fuel irradiated reactor components. Volume reduction is performed both onsite and offsite.

Solid waste is packaged in containers to meet the U.S. Department of Transportation requirements in 49 CFR Parts 171 through 180. Disposal and transportation are performed in accordance with the applicable requirements of 10 CFR Part 61, Part 71, and 49 CFR Parts 171-180. There are no releases to the environment from radioactive solid wastes created

at HNP. During 1999, 34 shipments of solid radwaste were made to Barnwell, South Carolina. The radwaste shipments may be shipped to a waste processor to reduce the volume before disposal or may be sent directly to a licensed disposal facility.

From year to year, the volume of radioactive contaminated waste generated will vary. The average volume of disposal waste at HNP over a recent 5-year period (1995-1999) is about 320 m³ (11,300 ft³), which is comparable to waste volumes generated at other boiling-water reactors based on information in the GEIS.

2.1.5 Nonradioactive Waste Systems

The primary nonradioactive chemical wastes generated at HNP are from reactor coolant system makeup water and water-treatment demineralizers. Nonsanitary, nonradioactive wastes are neutralized, routed to holding ponds, and eventually discharged to the Altamaha River. Sanitary wastes from the HNP are treated in a secondary treatment plant that was designed and constructed, and is operated according to applicable State and Federal water-quality standards. The plant chlorinates the effluent prior to discharge. The plant can treat up to 28,400 L (7500 gal) of raw sewage per day and would use about 4.5 kg (10 lb) of chlorine at maximum volume. The plant operation is regulated so that the effluent contains no more than 2 parts per million (ppm) of chlorine. The effluent from this treatment plant is discharged into the Altamaha River. Solid wastes (i.e., paper, metals, garbage, and other nonradioactive items) are collected and removed to a landfill.

2.1.6 Plant Operation and Maintenance

Routine maintenance performed on plant systems and components is necessary for safe and reliable operation of a nuclear power plant. Some of the maintenance activities conducted at HNP include inspection, testing, and surveillance to maintain the current licensing basis of the plant and to ensure compliance with environmental and public safety requirements. Certain activities can be performed while the reactor is operating. Others require that the plant be shut down. HNP units are on an 18-month refueling interval, and SNC generally schedules outages on staggered schedules, resulting in one outage per year for 2 years and two outages in the third year (cycle repeats).

SNC performed an aging management review and developed an integrated plant assessment (IPA) for managing the effects of aging on systems, structures, and components in accordance with 10 CFR Part 54. The IPA identified the programs and inspections that are managing the effects of aging at HNP. SNC determined that no refurbishment activities will be required for license renewal. Existing programs for surveillance, monitoring, inspections, testing, and modifications to plant systems, structures, and components will continue through the period of

extended operations as part of normal maintenance activities. Continuation of these programs will result in modifications to plant systems, structures, and components that are required to achieve performance improvements in the plant systems or by changes in regulations. The existing programs that control modifications at the plant require a review for environmental impact for each modification. SNC does not anticipate that any additional personnel or resources above the current plant staffing will be required for the performance of the identified aging management programs.

During the license renewal period, SNC does not anticipate the need to increase onsite or offsite personnel and expects the outage workforce to be within the range supporting current operations. Strategic planning for HNP projects a constant or slightly reduced workforce in the future based on industry benchmarks for boiling-water reactor units similar to HNP.

2.1.7 Power Transmission System

According to the SNC Environmental Report (ER; SNC 2000), six transmission lines were built by GPC to connect the HNP to the transmission system. Four of the lines—Eastman, S. Hazlehurst (Douglas), North Tifton, and Bonaire—were evaluated as part of the HNP Final Environmental Statement (FES; AEC 1972). The first three of these lines were built in 1971 to support HNP Unit 1 operation, and the last was built in 1976 to support HNP Unit 2 operation. Two additional lines were built in 1981 to support expansion of the GPC transmission system to Florida. All six lines, including those that were not evaluated in the 1972 FES, are evaluated in this supplemental environmental impact statement (SEIS).

The six transmission lines lie in four corridors as shown in Figure 2-6. Statistics associated with these corridors are listed in Table 2-1. SNC has stated that GPC plans to maintain these transmission lines indefinitely as a permanent part of the transmission system after HNP is decommissioned (SNC 2000).

The 1972 FES (AEC 1972) states that GPC used criteria published by the U.S. Department of the Interior to minimize the environmental effects resulting from the construction of its transmission lines. In general, routes are selected to minimize land-use conflicts, including selection to avoid all known national forests, areas of historical significance, and areas of archaeological significance. To minimize adverse visual effects, routes are selected to cross roads at an angle, where practical. When possible, trees and ground cover are left undisturbed near road crossings to provide additional visual protection. All rights-of-way are seeded with grasses, or other forage game foods after they are cleared. Owners of rights-of-way are encouraged to plant the rights-of-way in pasture, crops, or game-food plots. Uncultivated rights-of-way are cleared of brush about every 3 years.

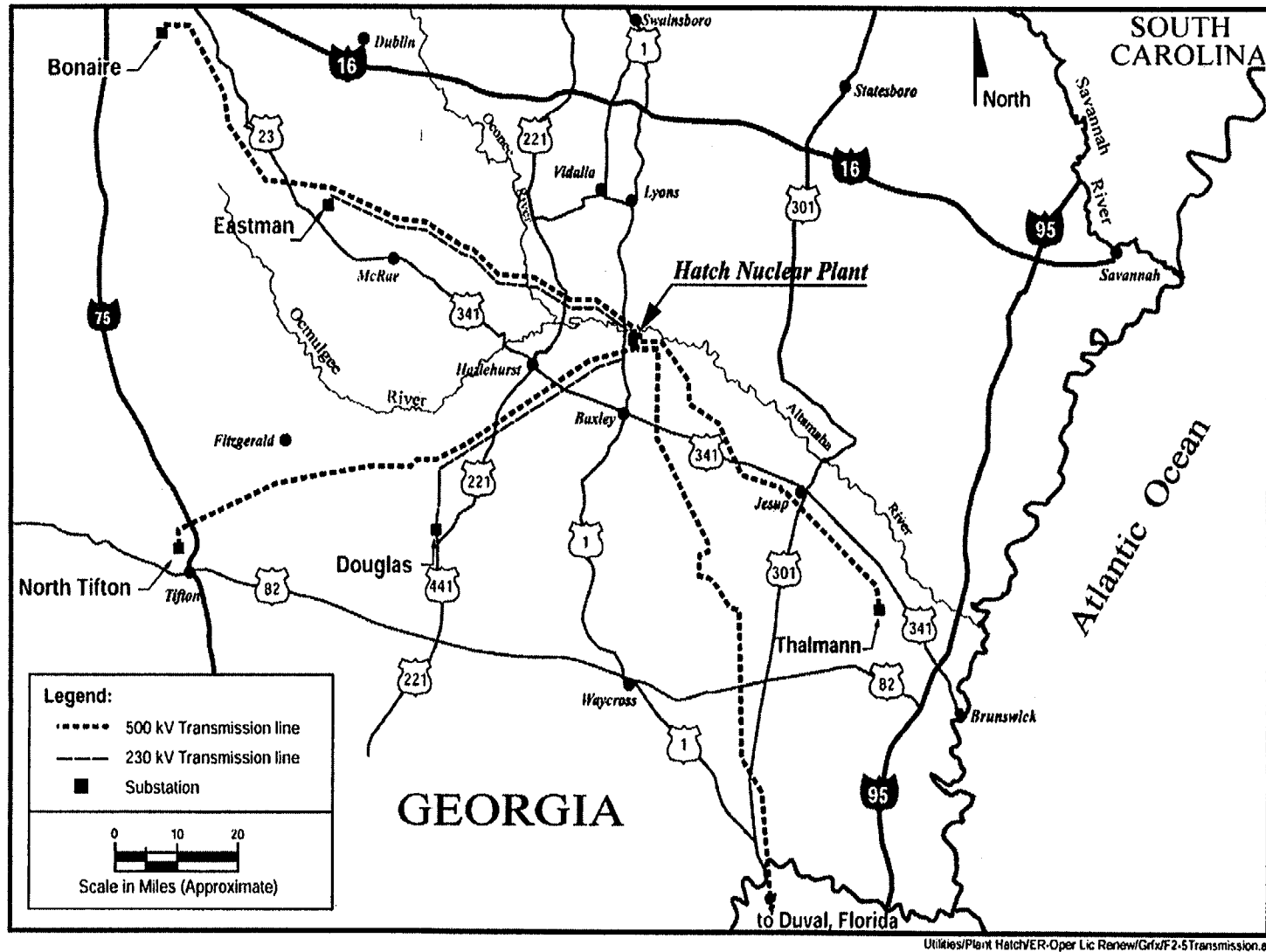


Figure 2-6. Hatch Nuclear Plant Transmission Lines

According to the SNC ER (SNC 2000), GPC sold the Eastman, Douglas, North Tifton, and Bonaire lines to Oglethorpe Power Corporation (OPC). As part of restructuring, OPC transferred ownership and maintenance responsibility for its transmission system to the Georgia Transmission Corporation (GTC). GTC uses maintenance practices similar to those used by GPC. The ER states that

HNP transmission line corridors pass through land that primarily is a mixture of cultivated land, grazing land, and managed timberlands (paper and pulp stock). Corridors that pass through farmlands generally continue to be used in this fashion. Corridors in timberlands and in the vicinity of road crossings are maintained on a 3-year cycle by mowing or, if inaccessible to mowers, by use of non-restricted herbicides.

These practices are consistent with the practices described in the FES (AEC 1972).

Table 2-1. Transmission Lines from Hatch Nuclear Plant (SNC 2000)

Corridor	kV	Date Built	Distance			Right-of- way Width		Area	
			km	(mi)		m	(ft)	ha	(acres)
Eastman	230	1971	85	(53)	joint	76	(250)	654	(1610)
Bonaire	500	1976	6	(4)	Eastman	38	(125)	25	(61)
			60	(37)	Bonaire	46	(150)	274	(673)
Douglas	230	1971	55	(34)	joint	76	(250)	419	(1030)
North Tifton	500	1971	16	(10)	Douglas	38	(125)	62	(152)
			77	(48)	North Tifton	46	(150)	355	(873)
Duval	500	1981	140	(87)		46	(150)	644	(1580)
Thalmann	500	1981	105	(65)		46	(150)	481	(1180)
Total			544	(338)				2914	(7159)

2.2 Plant Interaction with the Environment

Sections 2.2.1 through 2.2.8 provide general descriptions of the environment as background information. They also provide detailed descriptions where needed to support the analysis of potential environmental impacts of refurbishment and operation during the renewal term as discussed in Chapters 3 and 4. Section 2.2.9 describes the historic and archaeological resources in the area, and Section 2.2.10 describes possible impacts on other Federal project activities.

2.2.1 Land Use

HNP is located in Appling County, Georgia, southeast of where U.S. Highway 1 crosses the Altamaha River. The plant site is approximately 18 km (11 mi) north of Baxley, Georgia, which is the county seat of Appling County.

The HNP site consists of two tracts of land. The first is an approximately 360-ha (900-acre) parcel located north of the Altamaha River in Toombs County. The second is an approximately 540-ha (1340-acre) parcel south of the Altamaha River on which the plant is sited. All industrial facilities associated with the site are located in Appling County.

Of the approximately 910 ha (2240 acres) that make up the site, approximately 120 ha (300 acres) are committed to generation facilities, parking lots, laydown areas, roads, and maintenance facilities. Approximately 140 ha (350 acres) comprise wetlands and/or transmission corridors. The remaining 650 ha (1600 acres) are actively managed for wildlife and timber production.

The HNP site is not subject to the Georgia Coastal Zone Management Act because the plant is not sited on tidally influenced waters where the tide ebbs and floods daily and because the site is not within one of the designated Georgia coastal zone counties (Official Code of Georgia Annotated, §12-5-322).

The HNP site is not in an incorporated area of Appling County. There are no land-use or zoning restrictions applicable to land within unincorporated portions of Appling County.

2.2.2 Water Use

The Altamaha River is the major source of water for the plant. The Altamaha River is approximately 150 m (500 ft) wide and a maximum of 9 m (30 ft) deep at HNP. The river remains relatively undisturbed and has no major channelization, dredging, or major reservoirs. The U.S. Geological Survey maintains a gauging station (Number 02225000) on the right bank of the river 121 m (400 ft) downstream from the U.S. Highway 1 bridge, approximately 160 m (530 ft) upstream from HNP. Based on 49 years of record, the average annual flow rate at this station is 328 m³/s (11,580 ft³/s). Highest monthly flows normally occur in March and lowest monthly flows normally occur in September. The historical single day low flow is 46 m³/s (1620 ft³/s).

Presently there are no other competing industrial consumptive users of water from the Altamaha River in the vicinity of HNP, nor are there plans for any new major consumptive users

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in the foreseeable future. There are no water-quality issues with the river in the vicinity of HNP and no restrictions have been imposed on HNP during low-flow periods.

Water is withdrawn from the river to provide cooling for certain once-through loads and makeup water to the cooling towers. SNC is permitted (Georgia Department of Natural Resources [GADNR] Permit 001-0690-01) to withdraw a monthly average of up to 322,000 m³/d (85 million gpd) with a maximum 24-hour rate of up to 392,000 m³/d (104 million gpd). As a condition of this permit, SNC is required to monitor and report withdrawals. Based on reported withdrawals for the years 1989 through 1997, HNP withdraws an annual average of 216,000 m³/d (57 million gpd). Using the average water withdrawal rate, the velocity of the water approaching the intake screen is approximately 0.094 m/s (0.31 ft/s). At the extrapolated low river flow rate of 25 m³/s (900 ft³/s), the approach velocity is approximately 0.2 m/s (0.8 ft/s).

Water vapor is lost to the atmosphere ("consumed") through the evaporative cooling process. Thus the volume of water returned to the river (approximately 95,000 m³/d [25 million gpd]) is less than the volume withdrawn. The average HNP surface water consumption rate is approximately 123,000 m³/d (33 million gpd). When compared to the average river discharge, the consumptive loss represents about 0.44 percent of river flow. During minimum river discharge periods, the consumptive loss amounts to 3.1 percent.

The evaluation of surface water use in the 1978 FES (NRC 1978) concluded that the consumptive losses would be approximately 46 percent of the total water withdrawn from the river. In NRC's environmental assessment for an extended power uprate (63 FR 53474), NRC concluded that the necessary increase in makeup water to support the higher heat load would be insignificant and that cooling-tower discharge back to the river would decrease by approximately 2.4 m³/min (626 gpm).

HNP withdraws groundwater for potable and process use from the Floridan Aquifer. HNP is permitted (GADNR Permit 001-0001) to withdraw a monthly average of 4200 m³/d (1.1 million gpd) or 2.9 m³/min (764 gpm) with an annual average of 2.1 m³/d (0.5 million gpd) from its wells. Although the current permit indicates six onsite wells, there are actually only three wells that provide groundwater for domestic and process use. Wells 4 and 5 provide water for irrigation of ornamental vegetation. The sixth well was intended to provide makeup water for a wildlife habitat pond that was not completed; therefore, the well has not been installed.

Site Well 3 provides water for potable use only at the site recreational facility. Operation of this well as the source water supply for the GPC Recreation Facility potable water system is conducted under GADNR Permit NG0010011. Site Wells 1 and 2 provide water for potable use, sanitary facilities, and process use (e.g., demineralized water, fire protection). Operation

of these wells as the source water supply for the plant is conducted under GADNR Permit PG0010005. Figure 2-3 shows the locations of the three production wells.

GADNR requires SNC to monitor and report withdrawals from these five wells. Based on the reported withdrawals from 1990 to 1997, the two-unit operation requirements for this period averaged 0.48 m³/min (126 gpm) with a high month (January 1992) average of 0.89 m³/min (236 gpm).

2.2.3 Water Quality

Pursuant to the Federal Water Pollution Control Act of 1977 (FWPCA), commonly known as the Clean Water Act (CWA), the water quality of plant effluent discharges is regulated through the National Pollutant Discharge Elimination System (NPDES). The Environmental Protection Division (EPD) of GADNR is the State of Georgia agency delegated by EPA to issues discharge permits.

The NPDES permit for HNP (GA0004120), issued by GADNR's EPD in 1997, requires weekly monitoring of discharge temperatures, but it does not stipulate a maximum discharge temperature or maximum temperature rise across the condenser. Maximum discharge temperatures in the mixing box, which are reported to EPD quarterly, range from 17°C (62°F) in winter to 34°C (94°F) in summer.

To control biofouling of cooling system components, such as condenser tubes and cooling towers, an oxidizing biocide (typically sodium hypochlorite or sodium bromide) is injected into the system, as needed, to maintain a concentration of free oxidant sufficient to kill most microbial organisms and algae. When the system is being treated, blowdown is secured to prevent the discharge of residual oxidant into the river. After biocide addition, water is recirculated within the system until residual oxidant levels are below the discharge limits specified in the NPDES permit (GA0004120).

There are no water-quality issues related to the river in the vicinity of HNP. GADNR is unaware of any major issues likely to prevent renewal of the HNP NPDES permit due to expire in 2003. Any new regulation promulgated by EPA or GADNR would be included in future permits.

2.2.4 Air Quality

HNP is located on the Altamaha River between Savannah and Macon in south-central Georgia. It is approximately 18 km (11 mi) north of Baxley and 32 km (20 mi) south of Vidalia.

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Climatological records for Macon, Georgia,^(a) which should be generally representative of the site, show normal daily maximum temperatures ranging from about 14°C (57°F) in January to about 33°C (92°F) in July; normal daily minimum temperatures range from about 1°C (34°F) in January to about 21°C (70°F) in July. Precipitation averages about 115 cm (45 in.) per year.

Severe storms occur occasionally in the area, with thunderstorms occurring on about 40 percent of the days from June through August. Because of its distance from the coast, hurricanes do not generally pose a direct threat to HNP, although secondary effects may be felt at the site. Based on statistics for the 30 years from 1954 through 1983 (Ramsdell and Andrews 1986), the probability of a tornado striking the site is estimated to be approximately 9×10^{-5} per year.

The wind resource in Georgia near HNP is limited. The annual average wind power is rated as 1 on a scale of 1 to 7 with 1 being the lowest (Elliott et al. 1987). The closest region with a significant wind resource is the southern Appalachian Mountains in northeastern Georgia. Even there, the resource is limited because the area is highly confined and represents an extremely small percentage of the exposed land.

HNP has several diesel generators and boilers. Emissions from these generators and boilers are covered by a GADNR permit (4911-001-0001-V-01-0) under the Clean Air Act (CAA). Typically each source is operated 1 to 2 hr/month. In addition, the emergency diesel generators are operated for a 24-hour period each fuel cycle.

During most of the year, the region is under the influence of the Bermuda high-pressure system. High-pressure systems are typically associated with low winds and increased potential for air pollution problems. However, the region of Georgia in which HNP is located is in attainment of the National Ambient Air Quality Standards (40 CFR 81.311). The closest nonattainment area is the Atlanta area, which is more than 160 km (100 mi) to the northwest. The wilderness areas closest to HNP, designated in 40 CFR 81.408 as mandatory Class I Federal areas in which visibility is an important value, are the Okefenokee and Wolf Island wilderness areas. These wilderness areas are more than 80 km (50 mi) south and southeast, respectively, from HNP.

2.2.5 Aquatic Resources

The fish of the Altamaha River in the vicinity of HNP were characterized by the fish collections made during the monitoring of entrained and impinged fish at the water-intake structure. Five

(a) Climatological data for Macon, Georgia are available at <http://www.ncdc.noaa.gov/ol/climate/climatedata.html>

years (1975, 1976, 1977, 1979, and 1980) of impingement samples were collected at the plant (Nichols and Holder 1981). One hundred and sixty-five fish representing twenty-two species were collected (Table 2-2). The lowest rate of impingement during the 5-year study was 0.4 fish per day. The highest for the same period was 1.2 fish per day. The hogchoker, *Trinectes maculatus*, was the most abundant and the only species collected consistently each year. Most species were only collected once during the 5 years.

Table 2-2. Scientific and Common Names of Fish Collected During Entrainment and Impingement Studies at Hatch Nuclear Plant

Scientific Name	Common Name
<i>Alosa aestivalis</i>	Blueback herring
<i>Alosa sapidissima</i>	American shad
<i>Dorosoma</i> spp.	Shad
Clupeidae	Herring and shad
<i>Esox</i> spp.	Pickrel
<i>Esox americanus</i>	Redfin pickerel
<i>Hybognathus nuchalis</i>	Silvery minnow
<i>Notropis chalybaeus</i>	Ironcolor shiner
<i>Notropis petersoni</i>	Coastal shiner
Cyprinidae	Minnows
<i>Carpodes velifer</i>	Highfin carpsucker
<i>Minytrema melanops</i>	Spotted sucker
<i>Moxostoma anisurum</i>	Silver redhorse
<i>Ictalurus brunneus</i>	Snail bullhead
<i>Ictalurus nebulosus</i>	Brown bullhead
<i>Ictalurus punctatus</i>	Channel catfish
<i>Noturus gyrinus</i>	Tadpole madtom
<i>Aphredoderus sayanus</i>	Pirate perch
<i>Labidesthes sicculus</i>	Brook silverside
<i>Strongylura marina</i>	Atlantic needlefish
<i>Lepomis</i> spp.	Sunfish
<i>Lepomis auritus</i>	Redbreast sunfish
<i>Micropterus salmoides</i>	Largemouth bass
<i>Pomoxis</i> spp.	Crappie
<i>Perca flavescens</i>	Yellow perch
Percidae	Darters
<i>Trinectes maculatus</i>	Hogchoker

One Federal-listed aquatic species, the anadromous shortnose sturgeon, *Acipenser brevirostrum*, is known to occur in the Altamaha River in the vicinity of HNP. During the

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preoperational monitoring near HNP, one adult shortnose sturgeon was collected from the river channel by gill net. Other sampling efforts during 1973 to 1975 resulted in the collection of three other subadult specimens. The subadult specimens were only identified to genus (NUREG-0417). No sturgeon were collected during entrainment and impingement sampling conducted while HNP was operating (Nichols and Holder 1981).

SNC has committed to the conservation of significant natural habitats and protected species (SNC 1999). SNC has no plans to alter current patterns of operation over the license renewal period. SNC states that (1) any maintenance activities necessary to support license renewal would be limited to previously disturbed areas, (2) no expansion of existing facilities is planned, and (3) no major structural modifications are anticipated in support of license renewal.

The shoreline of the Altamaha River in the vicinity of HNP and immediately downstream for several miles is characterized by steep bluffs, floodplain forests, and sandbars. The riparian communities experience an average annual surface elevation fluctuation of approximately 2.7 m (9 ft). This conclusion is based on average daily flows for a 1-month period over the last 22 years. The consumptive loss incurred by plant operations has the greatest effect on surface elevation during low-flow periods. The duration of low-flow conditions is approximately 2 to 3 months during the late summer. The shoreline exposed during these periods is under water during the other 9 to 10 months of the year. Vegetation is found at elevations that are not flooded for most of the year by the river.

2.2.6 Terrestrial Resources

The HNP site encompasses approximately 910 ha (2240 acres), including 360 ha (900 acres) in southern Toombs County and 540 ha (1340 acres) south of the Altamaha River in northern Appling County, Georgia. Approximately 120 ha (300 acres) are used by SNC for general operation and maintenance of HNP (i.e., generation facilities, roads, parking lots, support buildings, laydown areas, etc). Approximately 140 ha (350 acres) are composed of wetlands and transmission corridors, and approximately 650 ha (1600 acres) are actively managed for wildlife and timber production (SNC 2000).

The largest wetland area covers approximately 40 ha (100 acres) just east of the generating facilities and cooling towers. Wetlands on the site are typically dominated by cypress and black gum. There are approximately 280 ha (700 acres) of deciduous floodplain forest in the Altamaha River floodplain; this forest is dominated by black gum, cypress, oak, and hickory trees. There are approximately 160 ha (400 acres) of planted pine forests (Loblolly and long-leaf pines) on the HNP site, mostly south and southwest of the generating facilities.

The HNP transmission lines are primarily within the Coastal Plain physiographic province, but the western portion of the Bonaire 500-kV line enters the Sandhills physiographic province. These lines extend for a distance of nearly 160 km (100 mi) in several different directions from the plant site, and therefore traverse the full range of habitat types and geophysical conditions typically found in south-central Georgia.

SNC commissioned a survey of the HNP site and transmission lines to evaluate the presence of plant and animal species listed or proposed by the U.S. Fish and Wildlife Service (FWS) as endangered or threatened, or listed by GADNR as endangered, threatened, rare, or unusual. This survey also included several 115-kV transmission lines that are not considered elsewhere in this SEIS; these lines were in place prior to plant construction and extend to the vicinities of Vidalia and Baxley, Georgia. Tables 2-3 and 2-4 list the plant and animal species that are

Table 2-3. Federal- and State-Listed Plant Species Evaluated as Potentially Occurring at the HNP Site or Within the Associated Transmission Line Rights-of-Way

Species	Common Name	Federal Status ^(a)	State Status ^(a)
<i>Baptisia arachnifera</i>	Hairy rattleweed	E	E
<i>Echinacea laevigata</i>	Smooth purple coneflower	E	E
<i>Lindera melissifolia</i>	Pondberry	E	E
<i>Oxypolis canbyi</i>	Canby dropwort	E	E
<i>Ptilimnium nodosum</i>	Mock bishop-weed	E	E
<i>Rhus michauxii</i>	Dwarf sumac	E	E
<i>Sarracenia oreophila</i>	Green pitcherplant	E	E
<i>Schwalbea americana</i>	Chaffseed	E	E
<i>Thalictrum cooleyi</i>	Cooley meadowrue	E	E
<i>Trillium reliquum</i>	Relict trillium	E	E
<i>Hymenocallis coronaria</i>	Shoals spiderlily	SC	E
<i>Panicum hirtii</i>	Hirst panic grass	SC	E
<i>Sarracenia leucophylla</i>	Whitetop pitcherplant	SC	E
<i>Sideroxylon thornei</i>	Swamp buckthorn	SC	E
<i>Asplenium heteroresiliens</i>	Wagner spleenwort	SC	T
<i>Calamintha ashei</i>	Ohoopee dunes wild basil	SC	T
<i>Cuscuta harperi</i>	Harper dodder	SC	T
<i>Hartwrightia floridana</i>	Hartwrightia	SC	T
<i>Litsea aestivalis</i>	Pondspice	SC	T
<i>Matelea alabamensis</i>	Alabama milkvine	SC	T
<i>Myriophyllum laxum</i>	Lax water-milfoil	SC	T
<i>Scutellaria ocmulgee</i>	Ocmulgee skullcap	SC	T
<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	Pickering morning-glory	SC	T
<i>Balduina atropurpurea</i>	Purple honeycomb head	SC	R
<i>Marshallia ramosa</i>	Pineland barbara buttons	SC	R

(a) Status Codes: E= Endangered, T = Threatened, R = Rare, SC = Federal species of concern (unofficial category, primarily former Category 2 candidates).

Table 2-4. Federal- and State-Listed Terrestrial Animal Species Evaluated as Potentially Occurring at the HNP Site or Within the Associated Transmission Line Rights-of-Way

Species	Common Name	Federal Status ^(a)	State Status ^(a)
<i>Dendroica kirtlandii</i>	Kirtland's warbler	E	E
<i>Mycteria americana</i>	Wood stork	E	E
<i>Myotis sodalis</i>	Indiana myotis	E	E
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	E
<i>Vermivora bachmanii</i>	Bachman's warbler	E	E
<i>Sterna antillarum</i>	Least tern	E	R
<i>Haliaeetus leucocephalus</i>	Bald eagle	T	E
<i>Ambystoma cingulatum</i>	Flatwoods salamander	T	R
<i>Drymarchon couperi</i>	Eastern indigo snake	T	T
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	-
<i>Falco peregrinus</i>	Peregrine falcon	SC*	E
<i>Gopherus polyphemus</i>	Gopher tortoise	SC**	T
<i>Macroclmys temminckii</i>	Alligator snapping turtle	SC	T
<i>Neofiber alleni</i>	Round-tailed muskrat	SC	T
<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	R
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	SC	R
<i>Notophthalmus perstriatus</i>	Striped newt	SC	R

(a) Status Codes: E= Endangered, T = Threatened, T(S/A) = Threatened due to similarity of appearance, R = Rare, U = Unusual, SC = Federal species of concern (unofficial category, primarily former Category 2 candidates), SC* = the Peregrine falcon was removed from the Federal list of threatened or endangered species (64 FR 46541), SC** = gopher tortoise is not listed in the State of Georgia, but is listed as threatened in other parts of its range, - = no listing status.

either listed or proposed for listing by FWS or species that are listed by the State of Georgia and are former FWS candidate species that were considered in the field evaluations. The complete list of species evaluated, including a number of additional State-listed species was provided in the threatened and endangered species survey report commissioned by SNC (Tetra Tech, Inc. 1999).

The applicant's survey identified several Federal- and State-listed species of concern on the HNP site or within the transmission corridors (Table 2-5). Bald eagles and wood storks were not detected during the 1998 and 1999 field surveys. They have been observed near the HNP site at other times, but are not considered residents of the area (SNC 2000).

GPC participates in several cooperative wildlife management programs, and maintains numerous feed plots for deer and turkey within transmission corridors as well as on portions of the HNP site. HNP also has an active onsite program to encourage wildlife usage of the HNP site, including the construction and monitoring of numerous nest boxes for song birds, kestrels, and wood ducks, as well as bat boxes (Southern Company 1999).

Table 2-5. Federal- or State-Listed Species Identified Within the HNP Site or Associated Transmission Line Rights-of-Way

Species	Common Name	Federal Status ^(a)	State Status ^(a)	Location ^(b)
PLANTS				
<i>Balduina atropurpurea</i>	Purple honeycomb head	SC	R	T, V, F
<i>Penstemon dissectus</i>	Cutleaf beardtongue	-	R	Th
<i>Sarracenia flava</i>	Yellow pitcherplant	-	U	B, T, Th, V, HNP
<i>Sarracenia minor</i>	Hooded pitcherplant	-	U	B, T, Th, V, Bx
<i>Sarracenia psittacina</i>	Parrot pitcherplant	-	T	F, T
<i>Sioxylon sp. nov.</i>	Ohoopie bumelia	-	N	F, T, V
ANIMALS				
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	E	F
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T	T	T
<i>Haliaeetus leucocephalus</i>	Bald eagle	T	E	HNP
<i>Mycteria americana heronry</i>	Wood stork	E	E	HNP
<i>Gopherus polyphemus</i>	Gopher tortoise	SC*	T	F, T, D, Th, B, V, HNP
<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	R	F, Th
<i>Alligator mississippiensis</i>	American alligator	T(SA)	-	B, T, Th

(a) Status Codes: E= Endangered, T = Threatened, T(S/A) = Threatened due to similarity of appearance, R = Rare, U = Unusual, SC = Federal species of concern (unofficial category, primarily former Category 2 candidates), SC* = gopher tortoise is not listed in the State of Georgia, but is listed as threatened in other parts of its range, N = species new to science - = no listing status.

(b) Location codes: HNP = Hatch Nuclear Plant Site, B = Bonaire 500-kV transmission line, T = North Tifton 500-kV transmission line, Th = Thalmann 500-kV transmission line, F = Florida (Duval) 500-kV transmission line, D = Douglas (South Hazlehurst) 230-kV transmission line, V = Vidalia 115-kV transmission line, Bx = Baxley 115-kV transmission line.

2.2.7 Radiological Impacts

SNC and its predecessor organizations have conducted a Radiological Environmental Monitoring Program (REMP) around the HNP site since 1974. The radiological impacts to the public and the environment have been carefully monitored, documented, and compared with the appropriate standards. The purposes of the REMF are to

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- verify that radioactive materials and ambient radiation levels attributable to plant operation are within the NRC regulatory limits and the U.S. Environmental Protection Agency environmental radiation standards in 40 CFR Part 190
- detect any measurable buildup of long-lived radionuclides in the environment
- monitor and evaluate ambient radiation levels
- determine whether any statistically significant increase occurs in the concentration of radionuclides in important pathways.

Radioactivity levels in the environment that are measured as part of the REMP are reported in the licensee's annual radiological environmental operating report (e.g., Southern Company 2000b). The REMP includes monitoring of the aquatic environment (aquatic organisms, shoreline sediment and water samples from the Altamaha River), atmospheric environment (air particulates and iodine), and terrestrial environment (vegetation, milk, and direct radiation).

Review of historical data on releases and the resultant dose calculations revealed that the doses to the maximally exposed individual for each pathway in the vicinity of HNP were a small fraction of the limits specified in EPA's environmental radiation standards, 40 CFR Part 190, as required by 10 CFR 20.1301(d). For 1999, dose estimates were calculated based on 1999 liquid and gaseous effluent release data. Calculations were performed using the plant effluent release data, onsite meteorological data, and appropriate pathways identified in the ODCM.

Southern Company reported the following estimated whole body doses to the most limiting member of the public for 1999:

- approximately 0.00074 mSv/yr (0.074 mrem/yr) based on gaseous and liquid effluent releases (Southern Company 2000a).

Cesium-137 was the major contributing radionuclide. These doses, which are representative of the doses from the period 1995-1999, are illustrative of the fact that doses are very small fractions of the 40 CFR Part 190 limits.^(a)

For 1999, dose estimates were also calculated based on radioactivity detected in the environment and attributed to plant operation a part of the REMP. Southern Company reported the following potential whole body doses to the most limiting member of the public for 1999:

(a) Annual dose equivalent not to exceed 0.25 mSv (25 mrem) to the whole body, 0.75 mSv (75 mrem) to the thyroid, and 0.25 mSv (25 mrem) to any other organ of any member of the public.

- approximately 0.00046 mSv/yr (0.046 mrem/yr) based on vegetation, 0.00013 mSv/yr (0.013 mrem/yr) based on fish, and 0.000049 mSv/yr (0.0049 mrem/yr) based on sediment results from the HNP environmental monitoring program (Southern Company 2000b)

In addition to the SNC REMP, GADNR conducts an environmental surveillance program around the HNP site and to a distance of up to 140 km (90 mi) for different sample types. The State program monitors the following: direct radiation, air, precipitation, vegetation, soil, groundwater, Altamaha River water, river sediment, and fish.

In its *Environmental Radiation Surveillance Report, 1997-Mid 1999* (GADNR 1999), GADNR found only trace quantities of zinc-65, manganese-54, and cesium-137 within 8 km (5 mi) downstream of the plant. In addition, trace quantities of cobalt-60 were observed over a 140-km (90-mi) stretch of the Altamaha River downstream to Darien, Georgia. GADNR concluded that measured concentrations were well below levels of concern and that there was no measurable impact on water, fish, or seafood downstream of HNP.

The applicant does not anticipate any significant changes to the radioactive effluent releases or exposures from HNP operations during the renewal period and, therefore, the impacts to the environment are not expected to change.

2.2.8 Socioeconomic Factors

The staff reviewed the applicant's ER and information obtained from several county staff members, local real estate agents/appraisers, and social services providers during the May 2000 site visit. The following sections describe the community and its housing, public services, offsite land use, visual aesthetics, noise, demography, and economy near HNP. The discussion is limited primarily to Toombs and Appling counties, which are the most impacted by actions undertaken by SNC.

2.2.8.1 Housing

Housing availability in Appling and Toombs counties is not limited by growth-management measures. The total housing and vacant units in Toombs and Appling counties in 1990 are shown in Table 2-6. More recent information is not available.

SNC has approximately 950 employees at HNP during routine operations. The number of onsite vendor and contract staff varies throughout the year by as many as 50 workers, yielding a total onsite workforce that ranges between 925 and 975 during routine operations. The onsite workforce increases by up to 800 temporary duty employees for a period of 1 to 2 months

Table 2-6. Housing Units and Housing Units Vacant (Available) by County (1990)

	Appling	Toombs
Housing Units	6629	9952
Occupied Units	5843	8804
Vacant Units	795	1148
Source: SNC 2000.		

during refueling outages, which are on an 18-month cycle (SNC 2000). In addition to the site employees, there are approximately 130 corporate staff dedicated to HNP who are located offsite in Birmingham, Alabama.

The SNC employees employed at the site reside in 33 Georgia counties. More than 85 percent of the employees reside in the five counties shown in Table 2-7. Seventy-one percent of those employees live in Appling (30 percent) and Toombs (41 percent) counties. The remaining employees' residences are distributed throughout the remaining 28 counties, mostly within 80 km (50 mi) of the site.

Table 2-7. Hatch Nuclear Plant—Employee Residence Information

County	Number of Personnel	Percent of Total Personnel
Tombs	367	41
Appling	290	30
Montgomery	61	6
Tattnall	46	5
Jeff Davis	40	4
Other	129	14
Total (approximately)	950	100
Source: SNC 2000.		

As displayed in Table 2-8, the 1970 resident population in Appling County was 12,726. In 1980, the population was 15,565, rising to 15,744 by 1990 (Georgia Department of Community Affairs [GDCA] 2000a) and increasing to an estimated 16,675 by July 1, 1999 (U.S. Census Bureau [USCB] 2000), or 5.9 percent over 1990 values. The 2010 population projection is 18,318 (Georgia Office of Planning and Budget [GOPB] 2000) or 9.9 percent over 1999.

Table 2-8. Population Growth in Appling and Toombs Counties, Georgia (1970-2010)

Year	Appling		Toombs	
	Population	Growth %	Population	Growth %
1970	12,726	--	19,151	--
1980	15,565	22.3	22,592	18
1990	15,744	1.2	24,072	6.6
1999 (estimated)	16,675	5.9	25,990	8
2010 (estimated)	18,318	9.9	28,934	11.3

Sources: GDCA 2000a; GDCA 2000b; USCB 2000; GOPB 2000.

Table 2-8 also contains data on Toombs County population growth and projections. The 2010 population projection is 28,934 (GOPB 2000) or 11.3 percent over 1990 values. It was only during the 1970 to 1980 period that Appling County had a higher percentage population growth rate than Toombs County. One potential reason for the higher growth rate was the construction of HNP, Units 1 and 2, during the decade of the seventies.

2.2.8.2 Public Services

- **Water Supply**

Table 2-9 provides a summary of water supply, use, and reserve capacity for public water supplies in Appling and Toombs counties. In Appling County, the municipalities of Baxley and Surrency are the only county areas served by public water supply systems. Baxley provides water service within the city and outside the city limits in certain areas through a distribution system that currently uses four wells screened to the Floridan Aquifer. The wells can produce approximately 11,800 m³/d (3.1 million gpd). The estimated demand on

Table 2-9. Groundwater Supply and Use

County	Town	Capacity (million gpd)	Use (million gpd)	Reserve Capacity (million gpd)
Appling	Baxley	3.1	0.6	2.5
	Surrency	0.3	Unknown	Unknown
Toombs	Lyons	4.3	0.7	3.6
	Santa Claus	Unknown	Unknown	Unknown
	Vidalia	4.9	2	2.9

Source: SNC 2000.

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the wells is 2300 m³/d (600,000 gpd). Considering the current demand, Baxley has approximately 9500 m³/d (2.5 million gpd) of available capacity (SNC 2000). The town of Surrency has two wells also pumping from the Floridan Aquifer. These wells are capable of producing 1100 m³/d (290,000 gpd) (SNC 2000).

Toombs County has three municipal water systems—Vidalia, Lyons, and Santa Claus. All three municipalities withdraw their water from the Floridan Aquifer. Lyons has a capacity of 16,300 m³/d (4.3 million gpd), with current demand of 2700 m³/d (700,000 gpd). This leaves a reserve capacity of 14,000 m³/d (3.6 million gpd). Vidalia has the capacity to pump 18,500 m³/d (4.9 million gpd). Current demands require 7600 m³/d (2.0 million gpd), leaving a reserve capacity of approximately 11,000 m³/d (2.9 million gpd). Santa Claus is served by one well. Its current demand was not available (SNC 2000).

• Education

Appling County has four elementary schools, one middle school, and one high school. Total enrollment in all the schools was 3510 during the 1998-1999 school year. Appling County is considering building a new high school because of the condition of the high school's aging physical plant (SNC 2000).

Toombs County has two elementary schools, one middle school, and one high school. Total enrollment for the 1998-1999 school year was approximately 2660 (SNC 2000). The city of Vidalia has its own school system. It has primary, elementary, and middle schools, and one high school. Total enrollment in the Vidalia school system for the 1999-2000 school year for preschool through grade twelve is 2367 students.^(a)

The Southeastern Technical Institute (STI) is located in Vidalia. The mission of the Institute "...is to contribute to the economic, educational, and community development of Montgomery, Tattnall, and Toombs counties by providing quality technical education, adult literacy education, continuing education, and customized business training" (STI 2000). Total enrollment for the 1999-2000 school year at the main and branch campuses in Vidalia and Toombs County averaged 864.^(b)

Of the adult population (age 25 and over) in Toombs County in 1990, at least 59.0 percent had completed high school, compared with the Georgia State average of 70.9 percent. A total of 27.4 percent of the county's population had at least some college education compared with the State average of 41.3 percent. Between 1990 and 1994, Toombs

(a) Personal Communication, Lucy Calroni, Curriculum Director, June 2, 2000.

(b) Personal Communication, Diana Lang (Registrar), STI, August 24, 2000.

County spent an average of \$3413 per pupil per year for public education, which was less than the statewide average of \$4002 for the same period (GDCA 2000b).

In contrast, at least 57.2 percent of the adult population (age 25 and over) in Appling County had completed their high school education. A total of 22.7 percent of the county's population had at least some college-level education. Appling County spent an average of \$4150 per pupil per year for the period 1990 through 1994, higher than Toombs County by 22 percent (GDCA 2000a). One reason for the higher expenditure is that HNP is located largely in Appling County. HNP is the largest contributor to the ad valorem property tax base of the county (see discussion in Section 2.2.8.6 of this report).

- **Transportation**

U.S. Highway 1 is the major north-south highway route bisecting Appling and Toombs counties. U.S. Highway 1 is a four-lane highway from Baxley past HNP where it enters Toombs County and becomes a two-lane road north of HNP to Interstate 16. Interstate 16 is the major east-west freeway serving the area. In 1998, the annual average daily traffic count for the highway south of the HNP site was 5314 vehicles and 4339 vehicles north of the site (SNC 2000). The State plans to widen the entire highway to four lanes, which would provide four-lane access from Baxley all the way to Interstate 16. The widening project is anticipated to begin within 5 years (SNC 2000).

U.S. Highway 341 runs east-west, linking the municipalities and developed areas of Appling County. It and U.S. Highway 1 are part of the Governor of Georgia's Economic Development System established to provide access to smaller cities and to encourage economic development. U.S. Highway 280 and State Highway 292 are the major east-west highways in Toombs County.

2.2.8.3 Offsite Land Use

- **Appling County**

Land-use projections for the county show that new commercial and industrial developments are expected to concentrate in Baxley and along the U.S. Highway 341 corridor, which parallels the Norfolk Southern rail line. New residential development is being encouraged near the cities of the county, particularly Baxley. The rest of the county is expected to remain in agricultural and forest use. Appling County does not have specific regulations concerning zoning, subdivisions, or land-use controls to implement or control development (SNC 2000).

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The Appling County Joint Planning Board has prepared a comprehensive plan to guide county development and growth. The county has an industrial park of approximately 30 ha (77 acres) with water, natural gas, and sewer available. Sites are available in the industrial park adjacent to the Norfolk Southern rail line. Fiber-optic lines and industrial buildings are also available.

The county's property tax rate is among the lowest 10 percent in Georgia (due in part to the presence of HNP in the county). Appling County has established incentives to assist industry in locating to the county, including, but not limited to, tax incentives, reduced interest loans, relocation assistance for equipment and facilities, and one-stop county permitting (Appling County Development Authority, Not Dated).

The county also can avail itself of Georgia State incentive programs, including job tax credits, a \$2 million revolving loan fund for wastewater treatment and pretreatment facilities, and education tax credits, among other incentives (Appling County Development Authority, Not Dated).

- **Toombs County**

Toombs County has an agricultural and industrial base. The most well-known agricultural crop in the county is the Vidalia sweet onion. Other crops contributing to the agricultural base include row crops, livestock, dairy products, poultry, eggs, and timber. The industrial base includes manufacturing facilities that in the past have focused on the textile industry. This is now changing, with more economic diversification taking place in the areas of retail trade, medical services, and non-textile manufacturing.

Toombs County has made an assertive effort to promote economic development. The county is the regional retail, wholesale, transportation, and distribution center for a population base of 126,000 in a 10-county area. Vidalia is the regional shopping center for a 48-km (35-mi) radius.^(a)

The Toombs County Development Authority (TCDA) and the Toombs County Chamber of Commerce promote economic development through programs that focus on expansion and leveraging of the existing industrial base. The TCDA has a new industrial park available in Lyons of 110 ha (260 acres) near U.S. Highway 1. The Toombs Corporate Center has a 5600-m² (60,000-ft²) speculative building expandable to 6500 m² (70,000 ft²). The Center is

(a) Personal Communication. May 11, 2000. John Ladson, Chairman, Toombs County Economic Development.

located on 80-plus ha (200-plus acres), most of which are developed. The county does not have growth-control measures that limit housing development (SNC 2000).

2.2.8.4 Visual Aesthetics and Noise

Access to the site is provided by U.S. Highway 1, which runs north-south by the plant site. The buildings on the site are largely screened from public view by the woods that surround the plant. Travelers on U.S. Highway 1 from the north, heading south, can see the steam rising from the cooling towers from several miles north of the plant site and entrance.

Because of the woods, topography, and lack of any close neighbors, noise from HNP is generally not an issue. The only sounds that may be heard offsite are the plant loudspeakers and gun firing range.

2.2.8.5 Demography

Resident and transient populations are described in the following sections.

- **Resident Population Within 16 km (10 mi)**

Table 2-10 shows the estimated population distribution in a 16 km (10 mi) radius of the HNP site in the 16 sectors centered on the points of the compass. Of note is the fact that there is zero population within 1.6 km (1 mi) of the site. In several sectors, there is zero or little population living within the sectors up to approximately 6.5 km (4 mi) to 8 km (5 mi) from the plant.

Table 2-11 shows the estimated population within a 16-km (10-mi) radius of the HNP site in 2030. Of note is the fact that, just as in 1990, there is little expected increase in population (in absolute, not percentage, terms) within the first 8 km (5 mi) of the site. Again of note is the fact that there is zero population within 1.6 km (1 mi) of the site. And, as before with the 1990 population data (Table 2-10), the same sectors have zero or little population in them out to approximately 6.5 km (4 mi) to 8 km (5 mi) from the plant.

- **Resident Population Within 80 km (50 mi)**

The population for the 80-km (50-mi) radius surrounding HNP in 1970 was 211,145 (NRC 1978). Total population within the 80 km (50-mi) radius increased 1.9 percent between 1970 and 1975.

Table 2-10. Estimated Population Distribution in 1990 Within a 16-km (10-mi) Radius of HNP

Sector	0 - 1 Miles	1 - 2 Miles	2 - 3 Miles	3 - 4 Miles	4 - 5 Miles	5 - 10 Miles	10-Mile Total
N	0	10	26	0	81	378	495
NNE	0	1	0	0	6	280	287
NE	0	0	0	15	27	259	301
ENE	0	0	0	0	3	108	111
E	0	0	0	0	22	23	45
ESE	0	0	34	0	0	229	263
SE	0	0	19	12	45	275	351
SSE	0	0	38	24	122	428	612
S	0	21	137	53	46	1900	2157
SSW	0	27	82	62	32	313	516
SW	0	55	23	15	9	218	320
WSW	0	0	32	0	14	372	418
W	0	72	0	128	0	103	303
WNW	0	0	0	38	0	324	362
NW	0	0	0	8	21	384	413
NNW	0	2	95	70	40	343	550
Total	0	188	486	425	468	5937	7504

Source: SNC 2000.

Table 2-11. Estimated Population Distribution in 2030 Within a 16-km (10-mi) Radius of HNP

Sector	0 - 1 Miles	1 - 2 Miles	2 - 3 Miles	3 - 4 Miles	4 - 5 Miles	5 - 10 Miles	10-Mile Total
N	0	14	38	0	116	540	708
NNE	0	1	0	0	10	400	411
NE	0	0	0	23	39	370	432
ENE	0	0	0	0	3	155	158
E	0	0	0	0	30	30	60
ESE	0	0	46	0	0	306	352
SE	0	0	27	16	61	368	472
SSE	0	0	50	32	163	573	818
S	0	29	185	70	62	2545	2891
SSW	0	35	109	83	44	420	691
SW	0	74	31	19	13	312	449
WSW	0	0	44	0	20	542	606
W	0	97	0	180	0	150	427
WNW	0	0	0	51	0	445	496
NW	0	0	0	12	29	534	575
NNW	0	2	136	100	57	490	785
Total	0	252	666	586	647	8180	10,331

Source: SNC 2000.

The 1990 resident population distributed between zero and a 80-km (50-mi) radius of HNP is shown by Table 2-12. By 1990, the total population living within a 80-km (50-mi) radius of HNP had increased to over 336,600—an increase of more than 125,500 (or 60 percent) since 1970 (SNC 2000). Populations for the sectors were calculated using population values at the census block level, the smallest enumeration used by the USCB. The 80-km (50-mi) radius from HNP contained 78 census blocks. The census blocks were included in the analysis if 50 percent of their area lay within the 80-km (50-mi) radius. Census blocks with less than 50 percent of their area within the 80-km (50-mi) radius were excluded from the analysis (SNC 2000).

Table 2-12. Estimated Population Distribution in 1990 Within a 80-km (50-mi) Radius of HNP

Sector	0 - 10 Miles	10 - 20 Miles	20 - 30 Miles	30 - 40 Miles	40 - 50 Miles	50-Mile Total
N	495	10,706	4375	1239	11,652	28,525
NNE	287	1007	1932	6657	5207	15,090
NE	301	3812	2833	2505	29,497	38,948
ENE	111	3008	4120	3916	5369	16,524
E	45	748	6868	1348	38,160	47,169
ESE	263	448	1278	3538	8931	14,458
SE	351	275	2002	15,477	881	18,986
SSE	612	922	1221	3880	2446	9081
S	2157	6646	1693	1983	32,090	44,569
SSW	516	1210	6203	2758	2193	12,880
SW	320	1457	1113	5178	18,479	26,547
WSW	418	7510	1041	2262	2407	13,638
W	303	2156	1654	1407	2682	8202
WNW	362	585	2308	6376	2721	12,352
NW	413	1335	4589	985	4347	11,669
NNW	550	4351	3802	5250	4040	17,993
Total	7504	46,176	47,032	64,817	171,102	336,631

Source: SNC 2000.

The projected population for 2030 within the 80-km (50-mi) radius is 498,834, or an increase of 48 percent over the 40-year period (SNC 2000). The distribution of the population is shown in Table 2-13. Total population by age distribution for 1990 (as of July 1, 1990) is shown in Table 2-14 for Appling and Toombs counties and the State of Georgia.

- **Transient Population**

Data on the transient population in the vicinity of HNP and Appling and Toombs counties were generally not available in the SNC ER application. The onsite workforce increases by as many as 800 temporary (1 to 2 months) duty employees during refueling outages. HNP

Table 2-13. Estimated Population Distribution in 2030
Within a 80-km (50-mi) Radius of HNP

Sector	0 - 10 Miles	10 - 20 Miles	20 - 30 Miles	30 - 40 Miles	40 - 50 Miles	50-Mile Total
N	708	15,316	5979	1566	15,056	38,625
NNE	411	1439	2575	7994	7051	19,470
NE	432	5199	3784	3409	51,355	64,179
ENE	158	3997	5356	5603	10,224	25,338
E	60	1051	8894	2100	77,421	89,466
ESE	352	949	1657	4272	11,779	18,657
SE	472	840	2740	21,220	1215	26,015
SSE	818	2053	1619	5407	3601	12,680
S	2891	11,745	1923	2541	45,212	61,421
SSW	691	2186	7126	3286	2800	15,497
SW	449	2537	1666	8278	28,568	41,049
WSW	606	11,559	1510	3476	3366	19,911
W	427	3392	2292	1948	3462	11,094
WNW	496	1241	2985	8320	3088	15,634
NW	575	2327	5818	1400	6530	16,075
NNW	785	6691	4985	6450	5597	23,723
Total	10,331	63,999	60,909	87,270	276,325	498,834

Source: SNC 2000.

Table 2-14. July 1, 1990, Population Estimates for Appling and Toombs Counties and the State of Georgia by Age Group

	Appling County	Toombs County	Georgia
Total Population	15,761	24,116	6,506,377
0 - 4	1100	1954	509,661
5 - 17	3519	5222	1,236,115
18 - 24	1552	2249	741,018
25 - 44	4715	7258	2,198,561
45 - 64	2970	4431	1,166,470
65+	1905	3002	654,552

Source: USCB 1999.

units are on an 18-month refueling interval, and SNC generally schedules outages on staggered schedules, resulting in one outage per year for 2 years and two outages in the third year (cycle repeats). The 800 temporary employees include contractors, employees from other SNC nuclear facilities, and corporate support staff.

Agriculture dominates the economy of Appling and Toombs counties (primarily row crops and the Vidalia sweet onion). Some transient population is required to support agricultural activities. In addition, there is some transient population related to the weekly and seasonal use of recreational facilities near and on the HNP site.

2.2.8.6 Economy

Between 1990 and 1997, Appling County marginally improved its position relative to State per capita income figures, while Toombs County's position worsened. These differences partly reflect the economic boom in Atlanta, and other places in northern and coastal Georgia, while the south-central Georgia region continues to be economically disadvantaged.

Toombs County had a number of manufacturing firms (mostly textile firms) leave the county during the 1990s. The per capita income gap between the two counties narrowed from 15 percent in 1990 to 6 percent in 1997. But replacement industry moving into Toombs County has kept employment in the county growing slowly, despite the loss of the textile firms.

The top three industrial sectors in Appling County in 1998 were manufacturing, transportation, and public utilities and services. SNC is the fifth largest employer (Georgia Department of Labor [GDL] 1998a) and is a high-wage employer for this area. The top three industrial sectors in Toombs County in 1998 were manufacturing, services, and retail trade (GDL 1998b).

In 1990, there were 6470 employed residents of Appling County, of which 78 percent or 5059 residents, were employed within the county (GDL 1998a). In 1998, the unemployment rate in Appling County was 10 percent compared to the State of Georgia at 4 percent (GDL 1998a). In 1990, there were 9843 employed residents in Toombs County, of which 77 percent worked within the county. Approximately 9 percent of the residents work in Appling County, and many of these are probably employed at the HNP (GDL 1998b). In 1998, the unemployment rate in Toombs County was 9 percent.

In 1990, the county's per capita income was \$11,702. Georgia's per capita income in 1990 was \$17,123 or 46 percent higher. In 1996, Appling's per capita income was \$16,318, while Georgia's per capita income was \$23,028 or 41 percent higher. While the gap between Appling's per capita income level and the State's is closing, it is still substantial (GDL 1998a; Georgia Department of Audits [GDA] 1999). Per capita income in Appling County was \$16,998 in 1997.

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Per capita income in Toombs County was \$17,950 in 1997, or 6 percent higher than Appling County. Part of the reason for the higher per capita income of Toombs County is the fact that many of the highly paid executives and operators employed by HNP reside in Vidalia in Toombs County. In 1990, the county's per capita income was \$13,477. This is 15 percent higher than Appling County. The State of Georgia per capita income was 27 percent higher (GDL 1998a; GDA 1999).

HNP is a major contributor to the taxes collected by Appling County. Table 2-15 presents the taxes paid to Appling County by HNP between 1994 and 1998. The "Appling County Digest" is the total property tax revenue that the county collects. The payments attributed to HNP come from three entities: Georgia Power, Oglethorpe Power, and the City of Dalton. During 1994, the total HNP tax payment represented \$7,430,139 or 74 percent of the payments to the Digest. By 1998, the payments had increased to \$8,484,489, or an increase of 14 percent when compared to 1994. HNP contributed 68 percent of the tax funds collected by the Digest in 1998, or a decline of 6 percent when compared to 1994 (SNC 2000). The reason for the decline is the depreciation of the HNP's physical plant and the fact that other businesses have contributed more to the assessed property rolls of Appling County.

Table 2-15. HNP Tax Payments to Appling County (in millions of dollars)

	1994	1995	1996	1997	1998
Appling County Digest	\$10.0	\$10.1	\$11.5	\$11.6	\$12.4
Georgia Power	\$4.2	\$4.1	\$4.5	\$4.5	\$4.6
Oglethorpe Power	\$3.0	\$3.0	\$3.5	\$3.5	\$3.7
City of Dalton	\$0.2	\$0.2	\$0.2	\$0.1	\$0.2
Total HNP Tax Payment	\$7.4	\$7.3	\$8.2	\$8.1	\$8.5
HNP Percent of County Digest	74 percent	73 percent	71 percent	70 percent	68 percent

Source: SNC 2000.

2.2.9 Historic and Archaeological Resources

This section discusses the cultural background and the known historic and archaeological resources at the HNP site and in the surrounding area.

2.2.9.1 Cultural Background

The region around the HNP site is rich in prehistoric and historic Native American and historic Euroamerican resources. This part of southeastern Georgia has an archaeological sequence that extends back about 12,000 years, although human use of the central Altamaha River

drainage basin seems to have been limited throughout much of this sequence. Similar to much of the surrounding southeastern states, archaeological eras defined for this part of Georgia fall into several sequential cultural periods of Native American occupation: the Paleo-Indian era (about 10,000 B.C. to 7800 B.C.); the Archaic era (7800 B.C. to 500 B.C.); the Woodland era (500 B.C. to A.D. 1000); the Mississippian era (A.D. 1000 to A.D. 1541); and the Historic era, initiated by the initial intrusion of Spanish explorers into the area (A.D. 1541 to A.D. 1850). The prehistoric eras were marked by initial reliance on big game hunting subsistence, followed by increased use of smaller game animals and plant foods in the Archaic era. Beginning late in the Woodland era, and increasing in importance in the following Mississippian era, were trends toward more sedentary villages, with more reliance on cultivated crops.

Occupation of the immediate vicinity of the HNP area seems to have been continuous in prehistoric times, although somewhat limited. According to Gresham (1996), nearly all prehistoric sites recorded in Toombs and Appling counties occur within or adjacent to the Altamaha River floodplain, with a near void of prehistoric sites away from the river. Barron (1981) discusses several Native American mound sites and cemeteries occurring a few miles downriver from HNP in Appling County.

At the time of contact by Euroamerican explorers, the Native American populations in the vicinity of the project area were generally attributed to groups of the larger Creek Indian Confederacy, although specific information for the central Altamaha River is scant. Swanton (1922) generally notes the presence of two Creek groups, the Hitchiti and the Tamati, near the confluence of the Ocmulgee and Oconee Rivers that combine to form the Altamaha River. However, the major concentrations of Creeks were upriver on the Ocmulgee and Oconee, and downriver near the coast.

Through a series of land cessions by the Creeks to the U.S. Government between 1790 and 1827, Creek occupation of Georgia ended with their removal to Indian Territory, where the Creeks exist today as the Muskogee Nation (Debo 1941; Green 1982). Appling County was formed after a Creek cession in 1818 (Barron 1981). Teasley (1940) has identified three periods in the history of Toombs County that apply to Appling County as well. These include an initial farming and stock-raising period from the late 1700s to about 1880; the timber and turpentine period of 1880 to about 1910; and finally an agricultural period from 1910 to the present.

The Altamaha River that runs through HNP has figured prominently in the history of the area (Barron 1981). During the early history of Georgia, the river was used to float oak masts to Darien for the ships of the English Navy. Subsequently, the river was used to transport cotton and lumber to the coast, by pole boats, rafts, and steamboats. Crossings played an important historical role as well, including several ferries. Adjacent to HNP, U.S. Highway 1 was preceded by a short-lived wooden road across the swamp in 1924, followed by the first bridge and concrete highway in 1927. The present Altamaha River Bridge was built in 1948 when the highway was enlarged (Gresham 1996).

2.2.9.2 Historic and Archaeological Resources at HNP

Historic and archaeological site file searches were conducted at the Georgia Historic Preservation Division, University of Georgia State Archaeological Site Files, the National Park Service's National Register Information System, and National Archaeological Database. In addition, sources at the University of Hargrett Rare Book and Manuscript Library, the Map Library at the University of Georgia Science Library, the Vidalia Public Library, and Appling County Heritage Center holdings were examined for literature and/or maps that would indicate the potential for historical and archaeological sites at HNP.

No historic or archaeological sites have been recorded on the HNP site, although no cultural resource inventories have been completed for any of the plant site acreage. Three archaeological surveys conducted within a mile of the HNP site indicate the potential existence of archaeological and historical sites in unsurveyed areas. In a larger area survey of the lower Ocmulgee River drainage, Snow (1977) recorded four archaeological sites about 0.8 km (0.5 mi) west of the HNP boundary in the Altamaha River Park. In a more recent survey of the same area, Wood (1984) relocated two of Snow's sites and discovered another three in the same vicinity. Wood evaluated two of these archaeological sites as being potentially eligible for listing on the National Register of Historic Places. The archaeological sites recorded by these two surveys reflected a Native American presence in this area that extends back some 4000 years, from the Late Archaic to the Mississippian eras. One of the sites yielded early historic era artifacts dating to the middle 1800s.

The third cultural resource survey was conducted for the widening of U.S. Highway 1; it included a stretch of the highway along the western plant site boundary starting northward from the road entering the plant site from the highway (Gresham 1996). No historical or archaeological sites were noted along the small segment south of the Altamaha River. North of the river, 11 historical sites were recorded, including 2 cemeteries and 9 19th-20th century houses.

The closest historical sites to HNP formally listed on the National Register of Historic Places include four in Appling County, all within the town of Baxley, and eight in Toombs County, two in the town of Lyons and the rest in Vidalia. A nomination for the Moody Farm Complex, located about 6.4 km (4 mi) southeast of the plant site is also on file at the Georgia Historic Preservation Division.

Only one site of potential historical significance is known to exist on the HNP site. This is the Bell Cemetery that is indicated on the U.S. Geological Survey Baxley NE quadrangle map. The cemetery is presently located within the HNP family recreation area, and is fenced and maintained by plant site personnel.

Reviews of historic maps and early aerial photographs and highway maps for the area did not indicate a potential for homesteads, at least during the 19th century. Although most early maps show primary transportation routes following the north bank of the Altamaha River (Georgia Department of Transportation, no date), two maps did indicate the presence of historic trails that extended along the south bank, and presumably through or very close to HNP property. These include Bernard's Path, which paralleled the south bank of the river eastward from Fort James (ca. 1793-1820) (Georgia Department of Archives and History, no date), and a road shown on an 1878 hand-drawn map on file at the Appling County Heritage Center that is labeled as the "public road from Macon to Darien."

2.2.10 Related Federal Project Activities

The staff reviewed the possibility that activities of other Federal agencies might impact the renewal of the operating license (OL) for HNP. Any such activities could result in cumulative environmental impacts and the possible need for the Federal agency to become a cooperating agency for preparation of the SEIS.

The staff did not receive any comments from other Federal agencies regarding related Federal project activities. Based on its review, the staff is not aware of any Federal project activities directly related to renewal of the OL for HNP that could result in cumulative environmental impacts or that would make it desirable for another Federal agency to become a cooperating agency for preparation of the SEIS.

2.3 References

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR 20.1301(d), "Dose limits for individual members of the public."

10 CFR Part 50, Appendix I, "Numerical guides for design objectives and limiting conditions for operation to meet the criterion 'as low as is reasonably achievable' for radioactive material in light-water-cooled nuclear power reactor effluents."

10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

40 CFR 81.311, "Section 111 Attainment Status Designations: Georgia."

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40 CFR 81.408. "Identification of Mandatory Class 1 Federal Areas Where Visibility is an Important Value: Georgia."

40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations."

49 CFR Subtitle B, Chapter 1, "Research and Special Programs Administration, Department of Transportation," Parts 171 through 180.

63 FR 53473-53478, "Southern Nuclear Operating Company, Inc., Edwin I. Hatch Nuclear Plant, Units 1 and 2; Environmental Assessment and Finding of No Significant Impact." October 5, 1998.

64 FR 46541-46558, "Endangered and Threatened Wildlife and Plants; Final Rule to Remove the American Peregrine Falcon from the List of Endangered and Threatened Wildlife, and to Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Contiguous United States." August 25, 1999.

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3.0 Environmental Impacts of Refurbishment

Environmental issues associated with refurbishment activities were discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a) The GEIS included a determination of whether the analysis of the environmental issues could be applied to all plants and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that did not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

License renewal actions may require refurbishment activities for the extended plant life. These actions may have an impact on the environment that requires evaluation, depending on the type of action and the plant-specific design. Environmental issues associated with refurbishment that were determined to be Category 1 issues are listed in Table 3-1.

Environmental issues related to refurbishment considered in the GEIS for which these conclusions could not be reached for all plants, or for specific classes of plants, are Category 2 issues. These are listed in Table 3-2. Category 1 and Category 2 issues related to refurbishment that are not applicable to the Edwin I. Hatch Nuclear Plant (HNP) because they are related to plant design features or site characteristics not found at HNP are listed in Appendix F.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table 3-1. Category 1 Issues for Refurbishment Evaluation

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections
SURFACE-WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)	
Impacts of refurbishment on surface-water quality	3.4.1
Impacts of refurbishment on surface-water use	3.4.1
AQUATIC ECOLOGY (FOR ALL PLANTS)	
Refurbishment	3.5
GROUNDWATER USE AND QUALITY	
Impacts of refurbishment on groundwater use and quality	3.4.2
LAND USE	
Onsite land use	3.2
HUMAN HEALTH	
Radiation exposures to the public during refurbishment	3.8.1
Occupational radiation exposures during refurbishment	3.8.2
SOCIOECONOMICS	
Public services: public safety, social services, and tourism and recreation	3.7.4; 3.7.4.3 3.7.4.4; 3.7.4.6
Aesthetic impacts (refurbishment)	3.7.8

The potential environmental effects of refurbishment actions would be identified, and the analysis would be summarized within this section, if such actions were planned. The Southern Nuclear Operating Company (SNC) indicated that it has performed an evaluation of structures and components pursuant to 10 CFR 54.21 to identify activities that are necessary to continue operation of HNP, Units 1 and 2, during the requested 20-year period of extended operation. SNC indicated that existing plant programs will result in modifications to plant systems, structures, and components that are required by changes in regulations or to achieve performance improvements in the plant systems (SNC 2000).

However, SNC stated that the modifications of these components are within the bounds of normal plant maintenance activities; therefore, they are not expected to affect the environment outside the bounds of plant operations as evaluated in the final environmental statements (FESs) (AEC 1972; NRC 1978). In addition, the SNC evaluation of structures and components,

Table 3-2. Category 2 Issues for Refurbishment Evaluation

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53 (c)(3)(ii) Subparagraph
TERRESTRIAL RESOURCES		
Refurbishment impacts	3.6	E
THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS)		
Threatened or endangered species	3.9	E
AIR QUALITY		
Air quality during refurbishment (nonattainment and maintenance areas)	3.3	F
SOCIOECONOMICS		
Housing impacts	3.7.2	I
Public services: public utilities	3.7.4.5	I
Public services: education (refurbishment)	3.7.4.1	I
Offsite land use (refurbishment)	3.7.5	I
Public services, transportation	3.7.4.2	J
Historic and archaeological resources	3.7.7	K
ENVIRONMENTAL JUSTICE		
Environmental justice	Not addressed	

as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications necessary to support the continued operation of HNP beyond the end of the existing operating licenses. Therefore, refurbishment is not considered in this supplemental environmental impact statement.

3.1 References

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

10 CFR 54.21, "Contents of application - technical information."

Environmental Impacts of Refurbishment

Southern Nuclear Operating Company (SNC). 2000. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage, Edwin I. Hatch Nuclear Plant.*

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4.0 Environmental Impacts of Operation

Environmental issues associated with operation of the Edwin I. Hatch Nuclear Plant (HNP) during the renewal term were discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999a).^(a) The GEIS included a determination of whether the analysis of the environmental issues could be applied to all plants and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that did not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

This chapter addresses those issues related to operation during the renewal term that are listed in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to HNP. Section 4.1 addresses the Category 1 issues applicable to the HNP cooling-tower-based heat dissipation system, while Category 2 issues applicable to the HNP cooling system are discussed at greater length in Sections 4.1.1 and 4.1.2. Section 4.2 addresses Category 1 issues related to transmission lines and land use, while a Category 2 issue is discussed in Section 4.2.1, and another issue requiring plant-specific review is discussed in Section 4.2.2. Section 4.3 addresses the radiological impacts of normal operation. There are no Category 2 issues related to radiological impacts of normal operation. Section 4.4 addresses the Category 1 issues related to the socioeconomic impacts of normal operation during the renewal term.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Environmental Impacts of Operation

- I Category 2 socioeconomic issues are discussed in Sections 4.4.1 through 4.4.5.
- I Environmental justice, an uncategorized issue, is discussed in Section 4.4.6. Section 4.5 addresses the Category 1 issues related to groundwater use and quality. Category 2 groundwater use and quality issues are discussed in Sections 4.5.1 and 4.5.2. Section 4.6 discusses the impacts of renewal-term operations on threatened and endangered species, a Category 2 issue. Section 4.7 addresses new information that was raised during the scoping period. The results of the evaluation of environmental issues related to operation during the renewal term are summarized in Section 4.8. Finally, Section 4.9 lists the references for Chapter 4.

4.1 Cooling System

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to the HNP cooling system operation during the renewal term are listed in Table 4-1. The Southern Nuclear Operating Company (SNC) stated in its Environmental Report (ER; SNC 2000a) that it is not aware of any new and significant information associated with the renewal of the HNP operating licenses (OLs). No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of the issues, the GEIS concluded that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- I • Altered current patterns at intake and discharge structures. Based on information in the GEIS, the Commission found that "Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of altered current patterns during the renewal term beyond those discussed in the GEIS.
- I • Temperature effects on sediment transport capacity. Based on information in the GEIS, the Commission found that "These effects have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of temperature effects on sediment transport capacity during the renewal term beyond those discussed in the GEIS.

Table 4-1. Category 1 Issues Applicable to the Operation of the HNP Cooling System During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)	
Altered current patterns at intake and discharge structures	4.2.1.2.1; 4.3.2.2; 4.4.2
Temperature effects on sediment transport capacity	4.2.1.2.3; 4.4.2.2
Scouring caused by discharged cooling water	4.2.1.2.3; 4.4.2.2
Eutrophication	4.2.1.2.3; 4.4.2.2
Discharge of chlorine or other biocides	4.2.1.2.4; 4.4.2.2
Discharge of sanitary wastes and minor chemical spills	4.2.1.2.4; 4.4.2.2
Discharge of other metals in waste water	4.2.1.2.4; 4.3.2.2; 4.4.2.2
AQUATIC ECOLOGY (FOR ALL PLANTS)	
Accumulation of contaminants in sediments or biota	4.2.1.2.4; 4.3.3; 4.4.3; 4.4.2.2
Entrainment of phytoplankton and zooplankton	4.2.2.1.1; 4.3.3; 4.4.3
Cold shock	4.2.2.1.5; 4.3.3; 4.4.3
Thermal plume barrier to migrating fish	4.2.2.1.6; 4.4.3
Distribution of aquatic organisms	4.2.2.1.6; 4.4.3
Premature emergence of aquatic insects	4.2.2.1.7; 4.4.3
Gas supersaturation (gas bubble disease)	4.2.2.1.8; 4.4.3
Low dissolved oxygen in the discharge	4.2.2.1.9; 4.3.3; 4.4.3
Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses	4.2.2.1.10; 4.4.3
Stimulation of nuisance organisms	4.2.2.1.11; 4.4.3
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER-BASED HEAT DISSIPATION SYSTEMS)	
Entrainment of fish and shellfish in early life stages	4.3.3
Impingement of fish and shellfish	4.3.3
Heat shock	4.3.3
TERRESTRIAL RESOURCES	
Cooling-tower impacts on crops and ornamental vegetation	4.3.4
Cooling-tower impacts on native plants	4.3.5.1
Bird collisions with cooling towers	4.3.5.2
HUMAN HEALTH	
Microbial organisms (occupational health)	4.3.6
Noise	4.3.7

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- Scouring caused by discharged cooling water. Based on information in the GEIS, the Commission found that "Scouring has not been found to be a problem at most operating nuclear power plants and has caused only localized effects at a few plants. It is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of scouring during the renewal term beyond those discussed in the GEIS.
- Eutrophication. Based on information in the GEIS, the Commission found that "Eutrophication has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information, including plant monitoring data and technical reports. Therefore, the staff concludes that there are no impacts of eutrophication during the renewal term beyond those discussed in the GEIS.
- Discharge of chlorine or other biocides. Based on information in the GEIS, the Commission found that "Effects are not a concern among regulatory and resource agencies, and are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information, including the National Pollutant Discharge Elimination System (NPDES) permit for HNP. Therefore, the staff concludes that there are no impacts of discharge of chlorine or other biocides during the renewal term beyond those discussed in the GEIS.
- Discharge of sanitary wastes and minor chemical spills. Based on information in the GEIS, the Commission found that "Effects are readily controlled through NPDES permit and periodic modifications, if needed, and are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information, including the NPDES permit for HNP. Therefore, the staff concludes that there are no impacts of discharges of sanitary wastes and minor chemical spills during the renewal term beyond those discussed in the GEIS.

- Discharge of other metals in waste water. Based on information in the GEIS, the Commission found that "These discharges have not been found to be a problem at operating nuclear power plants with cooling-tower-based heat dissipation systems and have been satisfactorily mitigated at other plants. They are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information, including the NPDES permit for HNP. Therefore, the staff concludes that there are no impacts of discharges of other metals in waste water during the renewal term beyond those discussed in the GEIS. |
- Accumulation of contaminants in sediments or biota. Based on information in the GEIS, the Commission found that "Accumulation of contaminants has been a concern at a few nuclear power plants but has been satisfactorily mitigated by replacing copper alloy condenser tubes with those of another metal. It is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of accumulation of contaminants in sediments or biota during the renewal term beyond those discussed in the GEIS. |
- Entrainment of phytoplankton and zooplankton. Based on information in the GEIS, the Commission found that "Entrainment of phytoplankton and zooplankton has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of entrainment of phytoplankton and zooplankton during the renewal term beyond those discussed in the GEIS. |
- Cold shock. Based on information in the GEIS, the Commission found that "Cold shock has been satisfactorily mitigated at operating nuclear plants with once-through cooling systems, has not endangered fish populations or been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds, and is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of cold shock during the renewal term beyond those discussed in the GEIS. |

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- Thermal plume barrier to migrating fish. Based on information in the GEIS, the Commission found that "Thermal plumes have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of thermal plumes during the renewal term beyond those discussed in the GEIS.
- Distribution of aquatic organisms. Based on information in the GEIS, the Commission found that "Thermal discharge may have localized effects but is not expected to effect the larger geographical distribution of aquatic organisms." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on the distribution of aquatic organisms during the renewal term beyond those discussed in the GEIS.
- Premature emergence of aquatic insects. Based on information in the GEIS, the Commission found that "Premature emergence has been found to be a localized effect at some operating nuclear power plants but has not been a problem and is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of premature emergence of aquatic insects during the renewal term beyond those discussed in the GEIS.
- Gas supersaturation (gas bubble disease). Based on information in the GEIS, the Commission found that "Gas supersaturation was a concern at a small number of operating nuclear power plants with once-through cooling systems but has been satisfactorily mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of gas supersaturation during the renewal term beyond those discussed in the GEIS.
- Low dissolved oxygen in the discharge. Based on information in the GEIS, the Commission found that "Low dissolved oxygen has been a concern at one nuclear power plant with a once-through cooling system but has been effectively mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not

expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of low dissolved oxygen during the renewal term beyond those discussed in the GEIS.

- Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses. Based on information in the GEIS, the Commission found that “These types of losses have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of losses from predation, parasitism, and disease among organisms exposed to sub-lethal stresses during the renewal term beyond those discussed in the GEIS.
- Stimulation of nuisance organisms. Based on information in the GEIS, the Commission found that “Stimulation of nuisance organisms has been satisfactorily mitigated at the single nuclear power plant with a once-through cooling system where previously it was a problem. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information, including the 316(a) demonstration report (Wiltz 1981). Therefore, the staff concludes that there are no impacts of stimulation of nuisance organisms during the renewal term beyond those discussed in the GEIS.
- Entrainment of fish and shellfish in early life stages (cooling-tower-based heat dissipation systems). Based on information in the GEIS, the Commission found that “Entrainment of fish has not been found to be a problem at operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of entrainment of fish and shellfish in early life stages with this type cooling system during the renewal term beyond those discussed in the GEIS.
- Impingement of fish and shellfish (cooling-tower-based heat dissipation systems). Based on information in the GEIS, the Commission found that “The impingement has not been found to be a problem at operating nuclear power plants with this type of cooling system

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and is not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of impingement with this type cooling system during the renewal term beyond those discussed in the GEIS.

- Heat shock (cooling-tower-based heat dissipation systems). Based on information in the GEIS, the Commission found that “Heat shock has not been found to be a problem at operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of heat shock with this type cooling system during the renewal term beyond those discussed in the GEIS.
- Cooling-tower impacts on crops and ornamental vegetation. Based on information in the GEIS, the Commission found that “Impacts from salt drift, icing, fogging, or increased humidity associated with cooling-tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of cooling-tower operation on crops and ornamental vegetation during the renewal term beyond those discussed in the GEIS.
- Cooling-tower impacts on native plants. Based on information in the GEIS, the Commission found that “Impacts from salt drift, icing, fogging, or increased humidity associated with cooling-tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of cooling-tower operation on native plants during the renewal term beyond those discussed in the GEIS.
- Bird collisions with cooling towers. Based on information in the GEIS, the Commission found that “These collisions [of birds with cooling towers] have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff’s site visit, the scoping process,

its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of bird collisions with cooling towers during the renewal term beyond those discussed in the GEIS. I

- Microbiological organisms (occupational health). Based on information in the GEIS, the Commission found that "Occupational health impacts are expected to be controlled by continued application of accepted industrial hygiene practices to minimize worker exposures." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of microbiological organisms during the renewal term beyond those discussed in the GEIS. I
- Noise. Based on information in the GEIS, the Commission found that "Noise has not been found to be a problem at operating plants and is not expected to be a problem at any plant during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of noise during the renewal term beyond those discussed in the GEIS. I

Category 2 issues related to cooling system operation during the renewal term that are applicable to HNP are discussed in the sections that follow. These issues are listed in Table 4-2.

4.1.1 Water-Use Conflicts

Surface-water withdrawals may impact riparian and instream habitat. Section 2.2.2 describes HNP surface-water withdrawals.

The impact of consumptive loss on the downstream riparian communities is associated with the small difference it causes in the river surface elevation. SNC has calculated the reduction in surface-water elevation resulting from HNP withdrawals (SNC 2000a, Attachment B). During periods of average river discharge, consumptive loss amounts to about a 0.01 m (0.03 ft) decrease in the downstream surface elevation. During periods of minimum river discharge, consumptive loss results in a lowering of the downstream surface elevation by approximately 0.02 m (0.08 ft).

Table 4-2. Category 2 Issues Applicable to the Operation of the HNP Cooling System During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
SURFACE WATER QUALITY, HYDROLOGY AND USE (FOR ALL PLANTS)			
Water-use conflicts (plants with cooling ponds or cooling towers using makeup water from a small river with low flow)	4.3.2.1; 4.4.2.1	A	4.1.1
HUMAN HEALTH			
I Microbiological organisms (public health)	4.3.6	G	4.1.2

The shoreline of the Altamaha River in the vicinity of HNP and immediately downstream for several miles is characterized by steep bluffs, floodplain forests, and sandbars. Based on average daily flows for a 1-month period over the last 22 years, the riparian communities experienced an average annual surface elevation fluctuation of approximately 2.7 m (9 ft). The consumptive loss incurred by plant operations has the greatest effect on surface elevation during low-flow periods. The duration of low-flow conditions is approximately 2 to 3 months during late summer. The shoreline exposed during these periods is under water during the other 9 to 10 months of the year.

Vegetation is found at elevations that are not flooded for most of the year by the river. When the river stage is high enough to flood the riparian communities, the impact of consumptive loss from plant operations is negligible.

Consumptive loss from plant operations during the low-flow periods would have the greatest impact on instream biological communities (e.g., mussels and fish) if it occurred during the spawning season. For example, if a reduction in flow (or river level) were enough to hinder upstream or downstream movement of anadromous fish or the movement of resident fish into shallow sloughs and oxbows to spawn, then there could be a reduction in spawning success. The spawning season for fish in the Altamaha River occurs in the spring and early summer, the period of highest flows in the Altamaha (SNC 2000a). Consumptive loss from plant operations is not expected to have any impact on instream communities, because the lowest average daily flow for a 1-month period occurs in September, and the highest average daily flow for a 1-month period occurs in March.

Freshwater mussels vary in their ability to withstand emersion (exposure to air). Some species have adapted to withstand prolonged periods of emersion, while others are emersion-intolerant. Mussels move over and through the substrate by means of a protrusible muscular foot. Some species are known to move several feet per hour in response to stagnant conditions or falling water levels. Other species respond to falling water levels by burrowing more deeply into the substrate, seeking moisture. However, most riverine species have evolved under seasonally fluctuating water-level conditions and are unaffected by small fluctuations in water level. Under worst-case conditions, consumptive losses would result in a 0.02-m (0.08-ft) lowering of water level downstream of HNP.

The staff reviewed the Clean Water Act 316(a) demonstration for HNP and the ER relative to potential water-use conflicts due to consumptive loss of stream flow. Based on this review, the staff has concluded that the potential impacts are SMALL, and mitigation is not warranted.

4.1.2 Microbiological Organisms (Public Health)

For plants discharging cooling water to cooling ponds, lakes, canals, or small rivers, the effects of microbiological organisms on human health are listed as a Category 2 issue and require plant-specific evaluation before license renewal. The Category 2 designation is based on the magnitude of the potential public health impacts associated with thermal enhancement of *Naegleria fowleri* and could not be determined generically (NRC 1996). The Nuclear Regulatory Commission (NRC) noted that the impacts of nuclear plant cooling towers and thermal discharges are considered to be of small significance if they do not enhance the presence of microorganisms that are detrimental to water quality and public health (NRC 1996). The assessment criteria relate to thermal discharge temperature, thermal characteristics, thermal conditions for the enhancement of *N. fowleri*, and impacts to public health.

HNP withdraws water for cooling from the Altamaha River via a shoreline intake and discharges it via offshore discharge structures. The cooling-water systems for Units 1 and 2 are identical. A mixing box for the river discharge receives cooling-tower blowdown, demineralized waste, cooling-tower overflow, and excess service water from both units. From the mixing box, two 1.1-m (42-in.) lines run down to the river and extend about 37 m (120 ft) into the river from the shoreline. The point discharge is about 384 m (1260 ft) downriver from the intake structure and about 1.2 m (4 ft) below the surface when the river is at its lowest level.

HNP discharge temperatures are monitored weekly by plant personnel and reported to the Watershed Planning and Monitoring Program of the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (GADNR). Discharge temperatures range from about 17 to 34°C (62 to 94°F) when the plant is operating. During summer months, when thermophilic organisms are most likely to occur, discharge temperatures have averaged 29 to 32°C (85 to 89°F) over the last 2 years. HNP discharge temperatures are below those known

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to be optimal for growth and reproduction of pathogenic microorganisms but could theoretically permit limited survival of these organisms in summer months. Temperatures in the Altamaha River immediately downstream of the HNP discharge structure are several degrees cooler than the temperatures in the immediate area of the discharge outfall (NRC 1978).

Another factor limiting concentrations of pathogenic microorganisms in the HNP discharge is the absence of a seed source or inoculant. Waste water is the usual source of pathogens in natural waters. The sewage-treatment plant has been upgraded and expanded to accommodate the sewage demand at HNP. HNP sewage treatment consists of two approximately 130 m³/d (35,000 gpd) extended aeration-activated sludge-treatment plants. Disinfection in the sewage-treatment plant reduces coliform bacteria and other microorganisms to levels that meet state water-quality standards. The circulating water is also chlorinated to control microbial organisms. Additionally, the Altamaha River upstream of HNP flows through a largely rural area and receives no substantial discharges of municipal, industrial, or agricultural wastes.

The staff has reviewed the thermal characteristics of the Altamaha River and the HNP discharge, and does not expect HNP operation to stimulate growth and reproduction of pathogenic microorganisms in the Altamaha River downstream of the plant. Under certain circumstances, the organisms might be present in the immediate area of the discharge outfall but would not be expected in sufficient concentrations to pose a threat to downstream water users. Many of these pathogenic microorganisms are ubiquitous in nature, occurring in the digestive tracts of wild mammals and birds, but are usually only a problem when the host is immunologically compromised. Although there is a potential for deleterious thermophilic microorganisms to be associated with the cooling system, the actual hazard to public health has not been documented or substantiated. The thermal characteristics of the HNP discharge would not promote the growth of microorganisms that are detrimental to water and public health. Thus, the staff concludes that the potential impacts of microbial organisms on human health resulting from the operation of the plant's cooling-water discharge to the aquatic environment on or in the vicinity of the site are SMALL, and mitigation is not warranted.

4.2 Transmission Lines

The final environmental statement (FES; AEC 1972) described four transmission lines that were built to connect HNP with the Georgia Power Company (GPC) transmission system. These transmission corridors cover approximately 1790 ha (4400 acres) over a total corridor length of approximately 299 km (186 mi). Since the start of operation of HNP Unit 2, two additional lines were constructed to connect the GPC transmission system to Florida. These additional lines, which cover an area of approximately 1120 ha (2760 acres) with a total transmission corridor length of approximately 245 km (152 mi), have also been included in this evaluation.

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, that are applicable to the HNP transmission lines are listed in Table 4-3. SNC stated in its ER (SNC 2000a) that it is not aware of any new and significant information associated with the renewal of the HNP OLs. No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the GEIS concluded that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-3. Category 1 Issues Applicable to the HNP Transmission Lines During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
TERRESTRIAL RESOURCES	
Power line right-of-way management (cutting and herbicide application)	4.5.6.1
Bird collisions with power lines	4.5.6.2
Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)	4.5.6.3
Floodplains and wetland on power line right-of-way	4.5.7
AIR QUALITY	
Air quality effects of transmission lines	4.5.2
LAND USE	
Onsite land use	4.5.3
Power line right-of-way	4.5.3

A brief description of the staff's review and GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Power line right-of-way management (cutting and herbicide application). Based on information in the GEIS, the Commission found that "The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, consultation with the U.S. Fish and Wildlife Service (FWS) and GADNR, or its evaluation of other information.

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Therefore, the staff concludes that there are no impacts of power line right-of-way maintenance during the renewal term beyond those discussed in the GEIS.

- Bird collisions with power lines. Based on information in the GEIS, the Commission found that "Impacts [of bird collisions with power lines] are expected to be of small significance at all sites." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, consultation with the FWS and GADNR, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of bird collisions with power lines during the renewal term beyond those discussed in the GEIS.
- Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock). Based on information in the GEIS, the Commission found that "No significant impacts of electromagnetic fields on terrestrial flora and fauna have been identified. Such effects are not expected to be a problem during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of electromagnetic fields on flora and fauna during the renewal term beyond those discussed in the GEIS.
- Floodplains and wetland on power line right-of-way. Based on information in the GEIS, the Commission found that "Periodic vegetation control is necessary in forested wetlands underneath power lines and can be achieved with minimal damage to the wetland. No significant impact is expected at any nuclear power plant during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, consultation with the FWS and GADNR, or its evaluation of other information. Therefore, the staff concludes that there are no impacts on floodplains and wetlands on the power line right-of-way during the renewal term beyond those discussed in the GEIS.
- Air quality effects of transmission lines. Based on the information in the GEIS, the Commission found that "Production of ozone and oxides of nitrogen is insignificant and does not contribute measurably to ambient levels of these gases." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other information. Therefore, the staff concludes that there are no air quality impacts of transmission lines during the renewal term beyond those discussed in the GEIS.

- Onsite land use. Based on the information in the GEIS, the Commission found that "Projected onsite land use changes required during ... the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other information. Therefore, the staff concludes that there are no onsite land-use impacts during the renewal term beyond those discussed in the GEIS.
- Power line right-of-way (land use). Based on information in the GEIS, the Commission found that "Ongoing use of power line right of ways would continue with no change in restrictions. The effects of these restrictions are of small significance." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other information. Therefore, the staff concludes that there are no impacts on use of power line rights-of-way during the renewal term beyond those discussed in the GEIS.

There is one Category 2 issue related to transmission lines, and another issue related to transmission lines is being treated as a Category 2 issue. These issues are listed in Table 4-4 and discussed in Sections 4.2.1 and 4.2.2.

Table 4-4. Category 2 and Uncategorized Issues Applicable to the HNP Transmission Lines During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
HUMAN HEALTH			
Electromagnetic fields, acute effects (electric shock)	4.5.4.1	H	4.2.1
Electromagnetic fields, chronic effects	4.5.4.2	NA	4.2.2

4.2.1 Electromagnetic Fields—Acute Effects

In the GEIS, the Commission found that without a review of the conformance of each nuclear plant transmission line with National Electrical Safety Code criteria (NESC 1997), it is not possible to determine the significance of the electric shock potential. Evaluation of individual plant transmission lines is necessary because the issue of electric shock safety was not addressed in the licensing process for some plants. For the other plants, some may have chosen to upgrade line voltage, or land use in the vicinity of transmission lines may have been changed. To comply with 10 CFR 51.53(c)(3)(ii)(H), the applicant must provide an assessment of the potential shock hazard if the transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system do not meet the recommendations of NESC for preventing electric shock from induced currents.

In the ER, SNC states:

GPC designed and constructed all HNP transmission lines in accordance with the edition of the National Electrical Safety Code...and industry guidance that was current when the line was built. Ongoing right-of-way supervision and maintenance of HNP transmission facilities ensures continued conformance to governing standards and includes routine aerial patrol, helicopter inspection, and ground inspection. At this time, aerial patrols of all corridors are conducted every other month and include checks for encroachments, broken conductors, broken or leaning structures, and signs of trees burning, any of which would be evidence of clearance problems. Slow helicopter inspections (45 miles per hour or less) are conducted annually for 500-kV lines to allow more careful checks of facilities and rights-of-way. Currently all lines are inspected from the ground and measured for clearance at questionable locations every 6 years. Problems noted during any inspection are brought to the attention of the appropriate organizations for corrective action.

According to the ER, there have been no upgrades in line voltage on the HNP transmission lines since they were constructed.

In 1977, the NESC was revised to include identification of the method for establishing minimum vertical clearances for electric lines having voltages exceeding 98 kV. The clearance must be sufficient to limit the induced current due to electrostatic effects to 5 milliamperes (5 mA) if the largest anticipated truck, vehicle, or equipment parked beneath the line were shorted to ground. The Duval and Thalmann transmission lines constructed in 1981 were designed to this limit. However, the four transmission lines initially constructed for HNP were built before this guidance was adopted. Nevertheless, the SNC ER (SNC 2000a) states that the 5-mA limit was used in the design of the 500-kV North Tifton and Bonaire lines because the limit was used by industry for high-voltage lines when the lines were designed.

GPC had not modeled the 230-kV Eastman and Douglas lines to evaluate the maximum induced current in those lines against the 5-mA limit, and computer-modeling capabilities have improved significantly since the 500-kV lines were designed. SNC stated (SNC 2000a) that SNC and GPC conducted an evaluation of all of the lines' adherence to the 5-mA induced current limit (GPC 1999a; 1999b) using the Electric Power Research Institute (EPRI) EFION computer program (EPRI High Voltage Transmission Research Center 1991), which is a generally accepted analytical methodology. The largest vehicle that SNC anticipates being under the HNP transmission lines is a tractor trailer parked on a public highway. Based on GPC minimum line vertical clearance design criteria of 10.3 m (33.7 ft) for 230-kV lines and 12.6 m (41.4 ft) for 500-kV lines at a conductor temperature of 48.9°C (120°F), the maximum induced currents were 1.25 mA for 230-kV lines and 3.84 mA for 500-kV lines for a 16.8-m (55-ft) long tractor trailer, 2.4 m (8 ft) wide and 4.1 m (13.5 ft) high.

The induced currents calculated in this evaluation were reported to be less than the NESC limit of 5 mA. Therefore, the staff concludes that the impact of the potential for electrical shock is SMALL, and mitigation is not warranted.

4.2.2 Electromagnetic Fields—Chronic Effects

In the GEIS, the chronic effects of electromagnetic fields from power lines were given a finding of "not applicable" rather than a Category 1 or 2 designation until a scientific consensus is reached on the health implications of these fields.

The potential for chronic effects from these fields continues to be studied and is not known at this time. The National Institute of Environmental Health Sciences (NIEHS) directs related research through the U.S. Department of Energy. A recent report (NIEHS 1999) states the following:

The NIEHS concludes that ELF-EMF [extremely low frequency-electromagnetic field] exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern.

This statement is not sufficient to cause the staff to change its position with respect to the chronic effects of electromagnetic fields. The staff considers the GEIS finding of "not applicable" still appropriate and will continue to follow developments on this issue.

4.3 Radiological Impacts of Normal Operations

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to HNP in regard to radiological impacts are listed in Table 4-5. SNC stated in its ER (SNC 2000a) that it is not aware of any new and significant information associated with the renewal of the HNP OLs. No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the GEIS concluded that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-5. Category 1 Issues Applicable to Radiological Impacts of Normal Operations During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
HUMAN HEALTH	
Radiation exposures to public (license renewal term)	4.6.2
Occupational radiation exposures (license renewal term)	4.6.3

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Radiation exposures to public (license renewal term). Based on information in the GEIS, the Commission found that "Radiation doses to the public will continue at current levels associated with normal operations." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of radiation exposures to the public during the renewal term beyond those discussed in the GEIS.
- Occupational radiation exposures (license renewal term). Based on information in the GEIS, the Commission found that "Projected maximum occupational doses during the license renewal term are within the range of doses experienced during normal operations and normal maintenance outages, and would be well below regulatory limits." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its

evaluation of other available information. Therefore, the staff concludes that there are no impacts of occupational radiation exposures during the renewal term beyond those discussed in the GEIS.

4.4 Socioeconomic Impacts of Plant Operations During the License Renewal Period

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to socioeconomic impacts during the renewal term are listed in Table 4-6. SNC stated in its ER (SNC 2000a) that it is not aware of any new and significant information associated with the renewal of the HNP OLs. No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the GEIS concluded that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-6. Category 1 Issues Applicable to Socioeconomics During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections
SOCIOECONOMICS	
Public services: public safety, social services, and tourism and recreation	4.7.3; 4.7.3.3; 4.7.3.4; 4.7.3.6
Public services: education (license renewal term)	4.7.3.1
Aesthetic impacts (license renewal term)	4.7.6
Aesthetic impacts of transmission lines (license renewal term)	4.5.8

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Public services: public safety, social services, and tourism and recreation. Based on information in the GEIS, the Commission found that "Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites." The staff has not identified any significant new information during its independent review of the SNC

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ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on public safety, social services, and tourism and recreation during the renewal term beyond those discussed in the GEIS.

- Public services: education (license renewal term). Based on information in the GEIS, the Commission found that "Only impacts of small significance are expected." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on education during the renewal term beyond those discussed in the GEIS.
- Aesthetic impacts (license renewal term). Based on information in the GEIS, the Commission found that "No significant impacts are expected during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no aesthetic impacts during the renewal term beyond those discussed in the GEIS.
- Aesthetic impacts of transmission lines (license renewal term). Based on information in the GEIS, the Commission found that "No significant impacts are expected during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000a), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no aesthetic impacts of transmission lines during the renewal term beyond those discussed in the GEIS.

Table 4-7 lists the Category 2 socioeconomic issues that require plant-specific analysis and environmental justice, which was not evaluated in the GEIS.

4.4.1 Housing Impacts During Operations

While determining housing impacts, the applicant chose to follow Appendix C of the GEIS (NRC 1996), which presents a population characterization method that is based on two factors, "sparseness" and "proximity" (GEIS, Section C.1.4). Sparseness measures population density within 32 km (20 mi) of the site, and proximity measures population density and city size within 80 km (50 mi). Each factor has categories of density and size (GEIS, Table C.1), and a matrix

Table 4-7. Category 2 Issues Applicable to Socioeconomics and Environmental Justice During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR	SEIS Section
		51.53(c)(3)(ii) Subparagraph	
SOCIOECONOMICS			
Housing impacts	4.7.1	I	4.4.1
Public services: public utilities	4.7.3.5	I	4.4.2
Offsite land use (license renewal term)	4.7.4	I	4.4.3
Public services, transportation	4.7.3.2	J	4.4.4
Historic and archaeological resources	4.7.7	K	4.4.5
ENVIRONMENTAL JUSTICE			
Environmental Justice	Not evaluated		4.4.6

is used to rank the population category as “low,” “medium,” or “high” (GEIS, Figure C.1). The population in the HNP area was categorized by the NRC as “low” (GEIS, Table C.2). Table 2-12 provides the population distribution for the area surrounding HNP, Units 1 and 2, based on 1990 census data. The population density within a 32-km (20-mi) radius of HNP is approximately 17 persons/km² (43 persons/mi²) and there is no city with a population of 25,000 within 32 km (20 mi), giving the site a Sparseness Category of 2. The population density within an 80-km (50-mi) radius is approximately 17 persons/km² (43 persons/mi²), and there is no city with a population of 100,000 within 80 km (50 mi), giving the site a Proximity Category of 1. These values combine to give the surrounding HNP population a category measure of 2.1; a “low” category as defined by GEIS Figure C.1.

In 10 CFR Part 51, Subpart A, Appendix B, Table B-1, the NRC concluded that impacts on housing availability are expected to be MODERATE to LARGE at plants located in “low” population areas or in areas where growth control measures are in effect. SMALL impacts result when no discernable change in housing availability occurs, changes in rental rates and housing values are similar to those occurring statewide, and no housing construction or conversions are needed to meet the demand.

During the license renewal period, SNC does not anticipate the need to increase onsite or offsite personnel, and expects the outage workforce to be within the range supporting current operations. Strategic planning by SNC projects a constant or slightly reduced workforce in the future based on industry benchmarks for boiling-water reactors similar to those employed at HNP. SNC determined that no refurbishment was necessary at HNP. Thus, SNC concludes that there would be no refurbishment-related impacts to area housing (SNC 2000a). Even

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establishing an upper bound on employment, applying an analysis used by the NRC in the GEIS,^(a) of 60 permanent workers during the license renewal period (plus 185 indirect jobs) would result in an increased demand for housing in Toombs and Appling counties of 174 units or 9 percent of available housing (see Table 2-6). In its ER, SNC concluded that even with the resulting decrease in housing availability for the bounding case scenario of 60 additional workers, there would not be a discernable change in housing availability, rental rates, and housing values. Nor would such hires spur housing construction or conversion. In addition, the staff did not identify any Federal projects or other activities that would add to housing impacts. As such, SNC concluded that license renewal impacts to housing would be SMALL, and would not warrant mitigation (SNC 2000a). The staff has reviewed the available information relative to housing impacts. Although HNP is located in a low-population area, there are no growth-control measures that limit housing development in effect and little or no change in the size of the plant workforce is anticipated. Based on its review, therefore, the staff concludes that the impact on housing during the license renewal period would be SMALL, and mitigation is not warranted.

4.4.2 Public Services: Public Utility Impacts During Operations

Impacts on public utility services are considered SMALL if there is little or no change in the ability of the system to respond to the level of demand, and thus there is no need to add capital facilities. Impacts are considered MODERATE if overtaxing of service capabilities occurs during periods of peak demand. Impacts are considered LARGE if existing levels of service (e.g., water or sewer services) are substantially degraded, and additional capacity is needed to meet ongoing demands for services. The GEIS indicates that, in the absence of new significant information to the contrary, the only impacts on public utilities that could be significant are impacts on public water supplies.

As described in the SNC ER, a municipal water supply is not used at the plant site; therefore, the plant operations do not directly affect any public water supply system. The ER states that operations at the plant site do not have a noticeable impact on offsite wells drawing from the Floridan Aquifer. Because plant demand is not expected to alter offsite groundwater use in the Floridan Aquifer, operations at HNP will not indirectly impact public water supply systems located in the vicinity of the plant (SNC 2000a).

(a) NRC applies a bounding workforce estimate of 60 license renewal workers per nuclear unit to estimate potential housing impacts. These workers are required to conduct increased inspections, surveillance, testing, and maintenance. The NRC uses this estimate as a conservative value to represent the upper bound of potential socioeconomic impacts. SNC anticipates that the increased inspection and maintenance would be performed mostly during the outages that are staggered so they do not coincide, thus making it unreasonable that each unit would require 60 additional workers. Instead, as a reasonably conservative estimate, SNC assumed that only 60 workers (not 120) would at most be required at HNP.

Another concern is the potential indirect impact resulting from additional workers moving to the area and placing additional demands on public water supply systems. As described in the ER, SNC does not anticipate the need to increase the onsite workforce during the license renewal period, and therefore, anticipates no impact on the public water systems as a result of license renewal. However, to demonstrate potential population-related impacts to area public water services, SNC used the upper-bound license renewal workforce of 60 additional full-time workers generating an additional indirect workforce of 185 jobs in the surrounding communities (described in Section 4.4.1 of this report). If each new worker represents one new family, the population in the area could increase by approximately 785, based on a family size of 3.2. SNC assumes that the residential distribution of the workers would be similar to the current worker distribution of 71 percent in Appling and Toombs counties. Thus, 560 of the new residents (out of the 785), would live in Appling and Toombs counties (SNC 2000a).

Section 2.2.8.2 describes the water supply system utilities in Appling and Toombs counties. For Appling and Toombs counties combined, the total available, reserve water service capacity is approximately 36,000 m³/d (9.4 million gpd). Continuing with the "upper bound" analysis, SNC estimated the plant-related population increase would generate a demand on public water supply systems of 170 m³/d (45,000 gpd), assuming that 100 percent of the growth attributable to license renewal are served by these municipal systems. This represents approximately 0.5 percent of the available reserved capacity in the two counties. Based on the level of demand that would be placed on the public water systems serving Appling and Toombs counties, SNC concludes that plant-related population growth (even given the upper bound analysis) would require no additional increase in municipal water supply capacity (SNC 2000a). No other projects were identified that would add significantly to water demand in the two counties.

The NRC staff concludes that impacts on groundwater during the license renewal period would be SMALL, either not detectable or so minor that they would not destabilize nor noticeably alter any important attribute of the resource, and that mitigation is not necessary. This conclusion is based on the fact that HNP's use of groundwater does not have a noticeable impact on offsite wells drawing from the Floridan Aquifer, SNC does not anticipate an increase in the workforce if the license is renewed, and the "upper bound analysis" of 560 new residents represents approximately 0.5 percent of the available water-use capacity in the two counties.

4.4.3 Offsite Land Use During Operations

Offsite land use during the license renewal term is a Category 2 issue (10 CFR 51, Subpart A, Appendix B, Table B-1). Table B-1 of 10 CFR 51 Subpart A, Appendix B notes that "significant changes in land use may be associated with population and tax revenue changes resulting from license renewal."

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Section 4.7.4 of the GEIS defines the magnitude of land-use changes as a result of plant operation during the license renewal term as follows:

SMALL, where there is very little new development and minimal changes to an area's land-use pattern

MODERATE, where there is considerable new development and some changes to the land-use pattern

LARGE, where there is large-scale new development and major changes in the land-use pattern.

SNC has not identified any increases in plant staffing related to the license renewal application; consequently, there are no population related land-use impacts during the license renewal term.

Tax revenue can affect land use because it enables local jurisdictions to be able to provide the public services (e.g., transportation and utilities) necessary to support development.

Section 4.7.4.1 of the GEIS states that the assessment of tax-driven land-use impacts during the license renewal term should consider (1) the size of the plant's payments relative to the community's total revenues, (2) the nature of the community's existing land-use pattern, and (3) the extent to which the community already has public services in place to support and guide development. If the plant's tax payments are projected to be small relative to the community's total revenue, tax-driven land-use changes during the plant's license renewal term would be small, especially where the community has preestablished patterns of development and has provided adequate public services to support and guide development. If the plant's tax payments are projected to be medium to large relative to the community's total revenue, new tax-driven land-use changes would be moderate. This is most likely to be true where the community has no preestablished patterns of development (i.e., land-use plans or controls) or has not provided adequate public services to support and guide development in the past, especially infrastructure that would allow industrial development. If the plant's tax payments are projected to be a dominant source of the community's total revenue, new tax-driven land-use changes would be large. This would be especially true where the community has no preestablished pattern of development or has not provided adequate public services to support and guide development in the past.

Appling County is the only jurisdiction that taxes HNP directly, and it is the principal jurisdiction that receives direct tax revenue as a result of HNP's presence. Because there are no major refurbishment activities and no new construction as a result of the license renewal, no new sources of plant-related tax payments are expected that could significantly influence land use in Appling County. However, during the license renewal term, new land-use impacts could result from the use by Appling County of the tax revenue paid by SNC for HNP. As discussed in

Section 2.2.8.6 and as shown in Table 2-15, SNC paid Appling County \$8.5 million in 1998 for HNP. This amount represented approximately 68 percent of the Appling County tax revenue, which, for the purpose of this analysis, is considered large relative to the county's total tax revenue.

Notwithstanding the high proportion of Appling County tax revenue paid by SNC, Appling County has experienced a minor population increase of 5.9 percent over the last decade. Toombs County has experienced a growth of 8 percent over this period (Table 2-8). Appling and Toombs counties do not have growth-control measures that limit housing. Land-use projections for Appling County show that new commercial and industrial developments are expected to concentrate in Baxley and along the U.S. Highway 341 corridor, which runs parallel to the Norfolk Southern rail line. New residential development is being encouraged near the cities of the county, particularly Baxley. The remainder of Appling County is expected to remain in agricultural and forest use.

Continuation of Appling County's tax receipts from HNP keeps tax rates below what they otherwise would have to be to fund the county's government and also provides for a higher level of public infrastructure and services than otherwise would be possible. Both Appling and Toombs counties' property tax rates are among the lowest 10 percent in Georgia. Appling County directly benefits from the location of the HNP site in the county while Toombs County benefits from having a greater percentage of the HNP workforce living in the county (see Table 2-7). Continued operation of HNP provides significant economic stability to the two counties and is likely to encourage new business development in the counties. Overall, this effect is positive because Appling and Toombs counties have higher unemployment rates and lower per capita income levels than the statewide averages (see Section 2.2.8.6).

Based on review of the issues related to land use and the criteria in the GEIS, the staff concludes that the net impact of plant-related population increases is likely to be SMALL. The staff also concludes that tax-related land-use impacts are likely to be SMALL. There are several reasons for these conclusions. First, SNC does not intend to refurbish HNP, Units 1 and 2, in conjunction with license renewal. Thus, there will be no increase in employment at the HNP site as a result of license renewal activities. Second, SNC has stated that the permanent workforce at HNP will remain stable during the renewed license operating period of 20 years (SNC 2000a). Third, the population increase in Appling County, not related to HNP employment, between 1990 and 1999 was only 5.9 percent (see Table 2-8). Finally, visual inspection by the staff and discussions with real estate agents in Baxley did not reveal significant housing development in Appling County. Approximately 150 new housing units (or two percent of the available housing stock in 1990 [Table 2-6]) are being developed in Appling County (30 stick-built and 120 manufactured homes) each year. Most of these units are being located in rural

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parts of the county.^(a) Additional mitigation for land-use impacts during the license renewal term does not appear to be warranted.

4.4.4 Public Services: Transportation Impacts During Operations

On October 4, 1999, 10 CFR 51.53(c)(3)(ii)(J) and 10 CFR Part 51, Subpart A, Appendix B, Table B-1 were revised to clearly state that "Public Services: Transportation Impacts During Operations" is a Category 2 issue (see NRC 1999a for more discussion of this clarification).

I This issue is treated as such in this SEIS.

Moderate population growth (less than 12 percent) is expected in Toombs and Appling counties between 1999 and 2010 (see Table 2-8). Even if there were an increase in plant employment of 60 workers (the upper bound), there would only be an approximate 1.4 percent increase in traffic volume on U.S. Highway 1 north of the HNP site and approximately 1.1 percent increase in traffic volume south of the plant. However, none of the expected growth identified in Table 2-8 will be due directly to increases in employment at HNP. Future general population increases may increase highway congestion at specific locations.

There are plans to widen U.S. Highway 1 to four lanes from Baxley to Interstate 16 within 5 years (SNC 2000a). Given these facts, the NRC staff concludes that any impact of HNP on transportation service degradation is likely to be SMALL and not require mitigation.

4.4.5 Historic and Archaeological Resources

- I The SNC license renewal application for HNP does not include plans for future land disturbances or structural modifications beyond routine maintenance activities at the plant.
- I Therefore, there would be no identifiable adverse effects to known historic and archaeological resources. Consultation between the license renewal applicant and the Georgia State Historic Preservation Office resulted in a determination by the State office that no known historic properties included in or eligible for inclusion in the National Register of Historic Places would be affected by the proposed action (SNC 1999a; GADNR 1999a).

- I Continued operation of the power plant and protection of the natural landscape and vegetation within the site boundaries would provide *de facto* protection during the term of the license renewal period for known or undiscovered resources located in an undisturbed area with secured access. HNP's commitment to continue conservation and security of the Bell Cemetery will continue to enhance long-term preservation of that property.

(a) Based on an interview with a group of real estate agents in Baxley, May 9, 2000.

However, additional care should be taken during normal operational and maintenance conditions to ensure that historic properties are not inadvertently impacted. These activities may include not only operation of the plant itself, but also land management-related actions such as recreation, wildlife habitat enhancement, or maintaining/upgrading plant access roads throughout the plant site. The environmental impacts of activities undertaken by SNC are managed through the Environmental Protection Plan (Appendix B to each unit's technical specifications) and the licensee's program to implement the requirements of 10 CFR 50.59, "Changes, tests, and experiments." Based on the finding that SNC did not identify any major refurbishment activities related to the renewal of the HNP OLs and that operation will continue within the bounds of plant operations as evaluated in the FESs (AEC 1972 and NRC 1978), it is the staff's conclusion that the potential impacts on historic and archaeological resources are expected to be SMALL, and mitigation is not warranted.

4.4.6 Environmental Justice

Environmental justice refers to a Federal policy in which Federal actions should not result in disproportionately high and adverse impacts on minority or low-income populations. Executive Order 12898 (59 FR 7629) directs Federal executive agencies to consider environmental justice under the National Environmental Policy Act of 1969 (NEPA). The Council on Environmental Quality (CEQ) has provided guidance for addressing environmental justice (CEQ 1997). Although it is not subject to the Executive Order, the Commission has voluntarily committed to undertake environmental justice reviews. Specific guidance is provided in NRC Office of Nuclear Reactor Regulation Office Letter 906, "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues" (NRC 1999b).

The staff examined the geographic distribution of minority and low-income populations recorded during the 1990 Census (U.S. Census Bureau [USCB] 1991) within 80 km (50 mi) of HNP, supplemented by field inquiries to the local planning departments and social service agencies in Toombs and Appling counties.

A minority population is defined to exist if the percentage of minorities within the census blocks affected by the proposed action exceeds the percentage of minorities in the entire State of Georgia by 20 percent, or if the percentage of minorities within the census block is at least 50 percent. Generally, minority populations are small and dispersed in an 80-km (50-mi) radius around the HNP site. Identified concentrations of minority populations are located primarily in the small towns in the area, including Vidalia, Baxley, Douglas, and Waycross (see cross-hatched areas in Figure 4-1). When individual minority populations are present, these are Black populations (SNC 2000a). Other minorities are present, including substantial numbers of Hispanics in Long and Liberty counties, but they do not meet the criterion of "minority populations" in the staff guidance (NRC 1999b).

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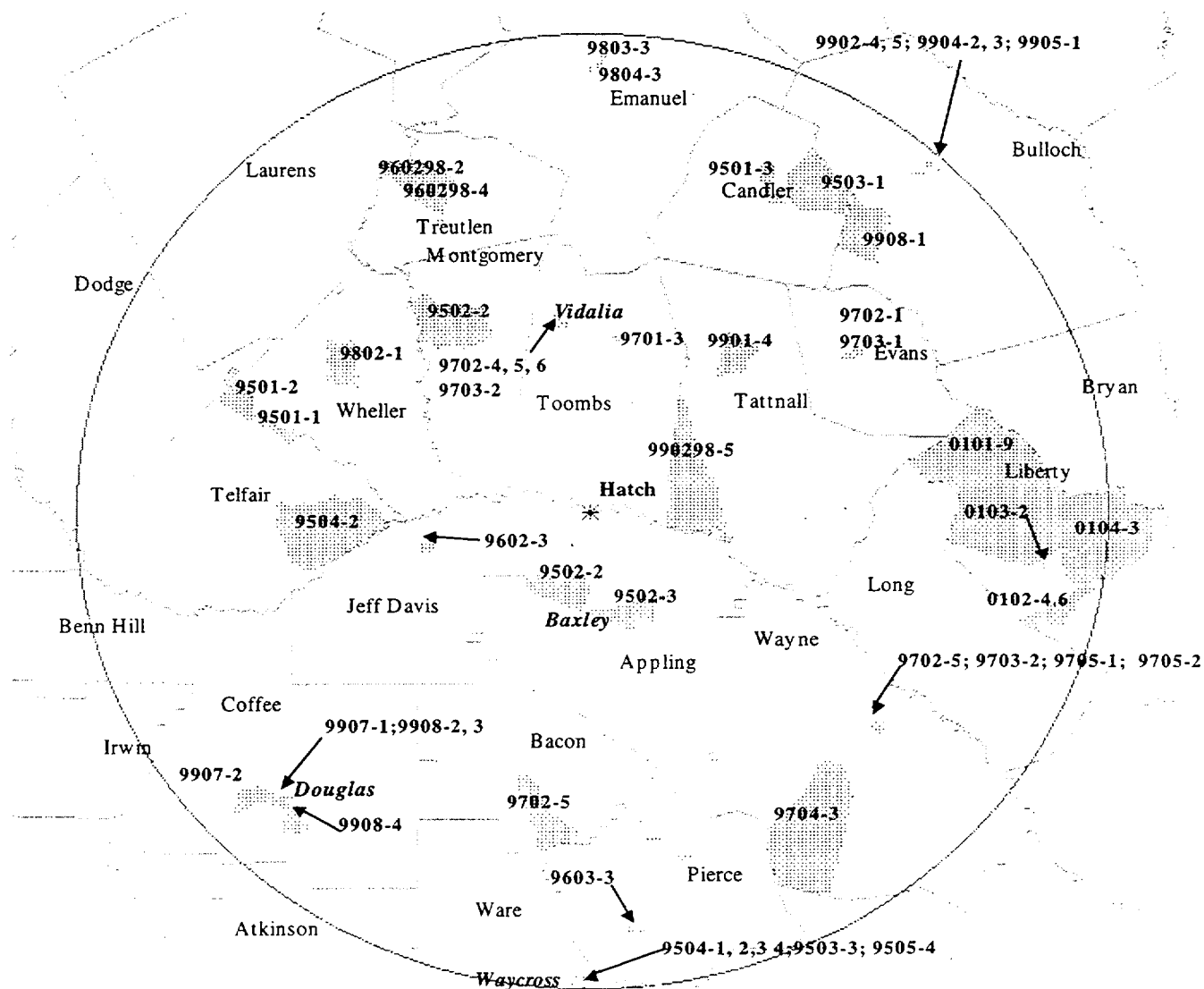


Figure 4-1. Geographic Distribution of Populations Classified as Minority Populations (Shown in Shaded Areas) -- 80 km (50-mi) Radius

- I A low-income population is defined to exist if the percentage of households below the poverty level is 20 percentage points or more above the percentage of households below the poverty level in the entire State of Georgia. Figure 4-2, also based on the 1990 Census (USCB 1991),

shows the geographic distribution of low-income populations (cross-hatched census blocks) within the 80-km (50-mi) radius of the plant. The largest concentrations of low-income populations within the 80-km (50-mi) radius are located in the counties of Wheller, Montgomery, Bulloch, and Wayne and the towns of Vidalia, Baxley, Douglas, and Waycross. Some small groups are scattered throughout the rural areas of Emanuel, Chandler, Tattnall, and Bacon counties.

With the locations of minority and low-income populations identified, the staff proceeded to evaluate whether any of the environmental impacts of the proposed action could affect these populations in a disproportionate manner. Based on staff guidance (NRC 1999b), air, land, and water resources within about 80 km (50 mi) of HNP were examined. Within that area, a few potential environmental impacts could affect human populations; all of these were considered SMALL for the general population. These include:

- groundwater-use conflicts (discussed in Section 4.5)
- electric shock (discussed in Section 4.2.1)
- microbial organisms (discussed in Section 4.1.2)
- postulated accidents (discussed in Chapter 5.0 of this SEIS and Chapter 5 of the GEIS)
- surface water-use conflicts (discussed in Section 4.1.1)

The pathways through which the environmental impacts associated with HNP license renewal can affect human populations are discussed in each associated section (e.g., Section 4.1.1 for surface water-use conflicts). The staff then evaluated whether these impacts could have a disproportionately high and adverse effect on the minority and low-income populations. The staff found no unusual resource dependencies or practices, such as subsistence agriculture, hunting, or fishing, through which the populations could be disproportionately affected. In addition, the staff did not identify any location-dependent disproportionate impacts affecting these minority and low-income populations. The staff concludes that HNP offsite impacts to minority and low-income populations would be SMALL, and no special mitigation actions are warranted.

4.5 Groundwater Use and Quality

There are no Category 1 issues applicable to HNP groundwater use and quality during the renewal term. Category 2 issues related to groundwater use and quality during the renewal term that are applicable to HNP are discussed in the sections that follow. These issues, listed in Table 4-8, require plant-specific analysis.

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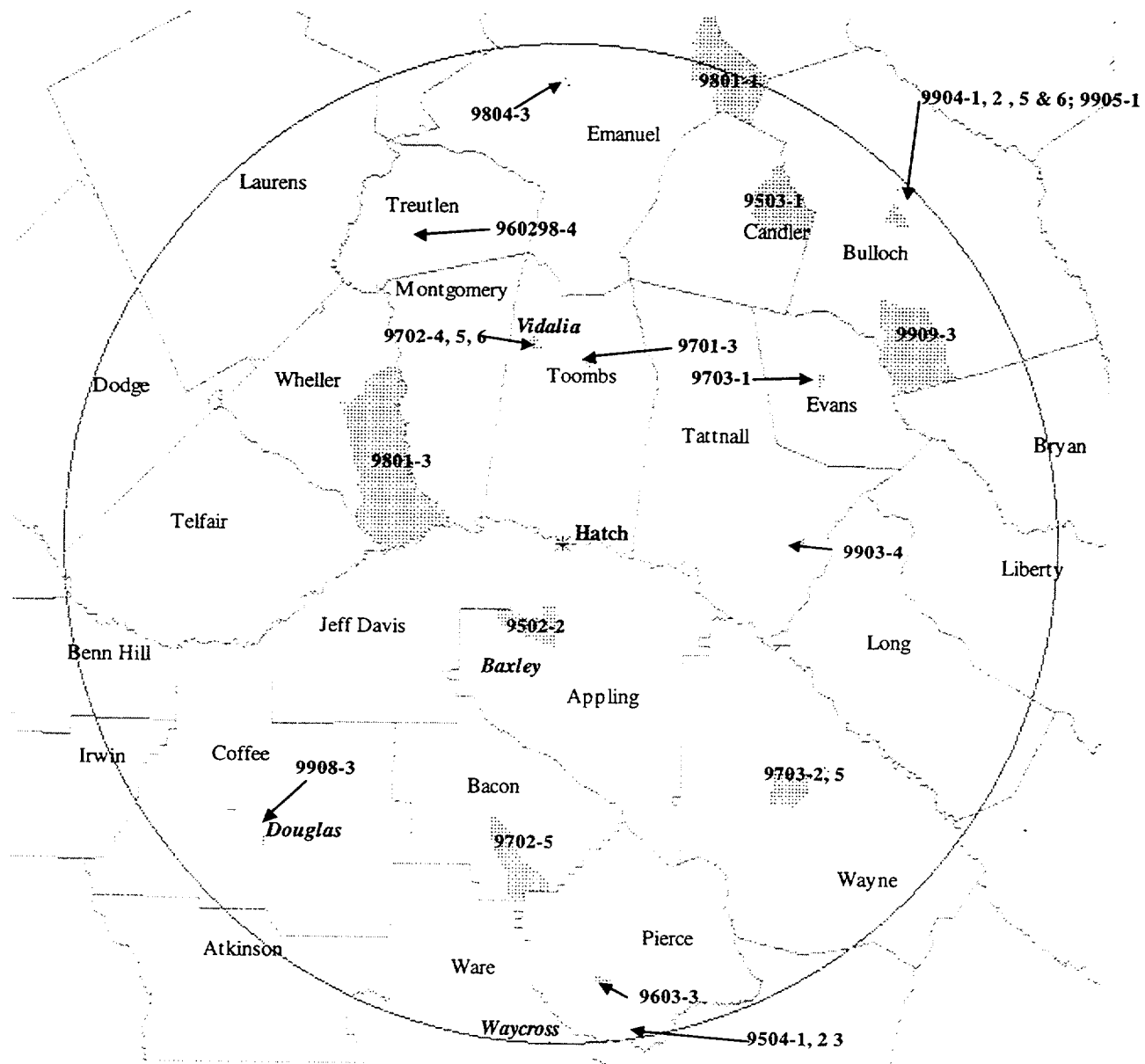


Figure 4-2. Geographic Distribution of Populations Classified as Low-Income Populations (Shown in Shaded Areas)—80-km (50-mi) Radius

4.5.1 Groundwater-Use Conflicts (Potable and Service Water)

Site Wells 1 and 2, described in Section 2.2.2, are screened in the principal artesian (Floridan) aquifer. During HNP construction, pump tests were conducted to determine the groundwater characteristics for this unit. The wells pumped for 9 hours at rates of approximately 2.85 m³/min (752 gpm) (Well 1) and approximately 3.02 m³/min (797 gpm) (Well 2). Drawdown in the wells stabilized at 1.5 m (5 ft) in Well 1 and 2.4 m (8 ft) in Well 2. Based on published literature, the transmissivity in the vicinity of the site is approximately 0.019 m³/s/m (130,000 gpd/ft) and the effective permeability is 0.03 and 0.06 m/min (0.1 and 0.2 ft/min). Data gathered during pumping tests and existing data for this aquifer indicate that a properly designed well installed within this aquifer unit can safely yield over approximately 4.2 m³/min (1100 gpm). A third site well, Well 3, was added to supply domestic water to the recreation facility. The well yield for Well 3 (less than 3.8 m³/d [1000 gpd]) will not significantly impact the water usage of the aquifer. Two smaller wells for irrigation of ornamental vegetation were placed in service in early 2000. Those wells typically draw 34 m³/d (9000 gpd) each and are used as needed.

Table 4-8. Category 2 Issues Applicable to Groundwater Use and Quality During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
GROUNDWATER USE AND QUALITY			
Groundwater-use conflicts (potable and service water; plants that use >379 L/min [>100 gpm]).	4.8.1.1 4.8.2.1	C	4.5.1
Groundwater-use conflicts (plants using cooling towers withdrawing makeup water from a small river)	4.8.1.3 4.4.2.1	A	4.5.2

Within the immediate vicinity of the site, the primary use of groundwater is for domestic needs, with a limited amount for livestock. Most domestic wells are screened within the unconfined aquifer. The closest offsite well that is screened to the principal aquifer is located approximately 300 m (1000 ft) southwest of the site (Figure 2-3). Currently, there is no industrial demand for groundwater within the vicinity of the site, and no groundwater is used for irrigation. The nearest appreciable demand is 16 km (10 mi) south of the site, where the town of Baxley has four wells withdrawing approximately 5,300 m³/d (1.4 million gpd) from the principal aquifer.

As described above, each of the onsite production wells is capable of producing approximately 2.8 m³/min (750 gpm). The pump test conducted during construction demonstrated that at this rate of pumping there was no interference between site Wells 1 and 2. These two wells are

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located approximately 542 m (1780 ft) apart, therefore, the effective radius is conservatively assumed to be approximately 600 m (2000 ft). The onsite well closest to the facility boundary is Well 1 at approximately 1000 m (3400 ft). Based on the conservative pumping rate of 2.8 m³/min (750 gpm) and a conservative effective radius of 600 m (2000 ft), the resulting drawdown in Well 1 would not extend to the facility boundary. Given that the actual plant groundwater requirements, approximately 0.48 m³/min (126 gpm), are about one fifth of that used to determine the effective radius, the drawdown of the groundwater potentiometric surface attributable to plant operations would be substantially less than that demonstrated by the original site pump test data, creating no interference with offsite wells.

The site production wells are located in the Floridan Aquifer. This aquifer unit is isolated geologically from the minor confined aquifer by a confining unit that is approximately 30 m (100 ft) thick. Since monitoring began at the facility in 1969, there has been little to no fluctuation of the water level in the minor confined aquifer. Water levels in the unconfined aquifers have been observed to vary according to normal seasonal fluctuations. There have been no observed effects in the monitoring wells installed in the shallow onsite aquifers from the pumping of groundwater from the Floridan onsite wells. Irrigation Wells 4 and 5 are also located in the Floridan Aquifer. A sixth well has been permitted in the formation above the Floridan Aquifer but has not been constructed.

Due to the high potential yields of the Floridan Aquifer and the low production yields required by HNP, HNP will have little effect on the regional water table. There is some limited domestic and agricultural use of groundwater in rural areas surrounding the site, but no groundwater-use conflicts have been identified as a result of current withdrawals. Therefore, the continued operation of HNP is considered to have a SMALL impact on regional groundwater use and does not require mitigation.

4.5.2 Groundwater-Use Conflicts (Makeup Water)

The alluvial aquifer at the site is primarily south of the Altamaha River within the facility boundary, and consists of approximately 16.7 m (55 ft) of poorly sorted sand, gravel, and clay. The alluvial aquifer contains groundwater under water table conditions. Clayey soils dominate in the upper portion of the aquifer. Recharge to the aquifer is mainly through the infiltration of local precipitation. Recharge is also provided in a limited amount by discharge from the Altamaha River during high stages and by the minor confined aquifer of the Hawthorn Formation, to which the alluvium is hydraulically connected. Groundwater typically discharges to the Altamaha River. Although no aquifer data exist for the unit, the alluvium in the region is considered to be a large potential source of water.

Based on the information provided in Section 4.1.1, the consumptive use of HNP is estimated to lower the river elevation by 0.02 m (0.08 ft) during low-flow conditions. Such a small change

would not appreciably alter the potentiometric gradient in the alluvial aquifer. Therefore, the impact to the groundwater resource from the reduced streamflow is SMALL and does not require mitigation.

4.6 Threatened or Endangered Species

Threatened or endangered species are listed as a Category 2 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, as shown in Table 4-9. This issue requires consultation with appropriate agencies (FWS or National Marine Fisheries Service [NMFS]) to determine if threatened or endangered species are present and whether they would be adversely affected during the license renewal term.

Table 4-9. Category 2 Issue Applicable to Threatened or Endangered Species During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR	SEIS Section
		51.53(c)(3)(ii) Subparagraph	
THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS)			
Threatened or endangered species	4.1	E	4.6

Assessment of the potential occurrence of endangered or threatened species in the vicinity of HNP was initiated in December 1997 when SNC requested database information from GADNR concerning known occurrences of State- or Federal-listed species in the vicinity of HNP (GPC 1997). SNC commissioned a field survey of the HNP site and all of the transmission lines associated with HNP, as well as a freshwater mussel survey in a 19-km (12-mi) reach of the Altamaha River up and downstream of HNP (Law 1998). The draft of the terrestrial survey was completed in September 1999 (Tetra Tech, Inc. 1999). These surveys detected the presence of several Federal-listed species and a number of State-listed species of concern (Table 2-5). Most of the documented occurrences were within transmission corridors well away from the HNP site, but a few species were documented at or near the HNP site. SNC determined that its operation and maintenance procedures would remain unchanged during the license renewal term, and did not threaten the existence of the listed species at HNP or in associated transmission corridors.

SNC forwarded the results of the freshwater mussel and terrestrial surveys to FWS and GADNR in September 1999 (SNC 1999b; 1999c), along with a request for concurrence with a "no effect" determination regarding license renewal.

GADNR concurred with the SNC conclusions (GADNR 1999b), but FWS did not (FWS 1999). FWS indicated that it could not concur with a "no effect" determination, and requested

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additional information about the plant operations, and how these operations may affect the shortnose sturgeon. FWS also requested that SNC further investigate the potential occurrence of the flatwoods salamander in the vicinity of HNP or associated transmission lines.

SNC representatives met with FWS during November 1999 and provided a biological information update concerning the flatwoods salamander and shortnose sturgeon in December 1999 (SNC 1999d). Based on the information provided by the applicant, FWS concurred with a no adverse effect determination regarding endangered or threatened species under the purview of FWS in January 2000 (FWS 2000).

SNC contacted NMFS during September 1999 requesting concurrence with a "no effect" determination concerning the shortnose sturgeon in the Altamaha River (SNC 1999e). NMFS determined that, based on the information provided, it was unable to concur with a "no effect" determination concerning the potential effects of license renewal on the shortnose sturgeon (NMFS 1999). SNC representatives met with NMFS and provided additional information concerning shortnose sturgeon near HNP and operational effects of HNP on the Altamaha River in October 1999 (GPC 1999c) and February 2000 (SNC 2000b). On August 31, 2000, the NRC staff submitted its biological assessment of the impact of HNP operations on shortnose sturgeon to NMFS's Southeast Regional Office, in St. Petersburg, Florida (NRC 2000), initiating an informal consultation under Section 7 of the Endangered Species Act. This consultation is continuing and will be concluded in the future.

During its preparation of the biological assessment, the staff collected and evaluated information related to the shortnose sturgeon's life cycle, range, migration patterns, and spawning. The staff also evaluated potential impacts related to (1) entrainment and impingement of shortnose sturgeon at the HNP intake structure and (2) thermal effects.

The staff found no evidence that the water-intake operations and thermal effects of the HNP license renewal will adversely impact the shortnose sturgeon. There is no evidence that HNP operations have influenced the migration of shortnose sturgeon to and from spawning grounds upstream of the plant. Monitoring of entrainment and impingement at HNP indicate that few, if any, sturgeon are impinged at the intake screens or entrained in the water pumped to the cooling towers. In its biological assessment, the staff concluded that operation of HNP may affect, but is not likely to adversely affect, the shortnose sturgeon. When NMFS provides its conclusions, any remaining issues will be resolved as operating plant issues because any impacts on the shortnose sturgeon are occurring now, as well as in the future.

In a letter dated April 25, 2001 (SNC 2001), SNC updated the biological status information it had supplied to NMFS in a letter dated February 2, 2000 (SNC 2000b). The additional information provided in the update is consistent with previous information supplied by SNC and further supports the conclusion the staff reached in its biological assessment. In its April 25,

2001, letter, SNC also offered to participate in the existing Shortnose Sturgeon Recovery Team and agreed to include a description of the shortnose sturgeon in plant training for the intake structure screen operation. SNC's participation on the recovery team will assist those who are working to promote the recovery of this species. The training will help to ensure that operators are able to recognize a shortnose sturgeon if one is ever impinged at the plant intake structure.

Based on the results of its assessment for the shortnose sturgeon and its review of freshwater mussels and terrestrial surveys, the staff concludes that the impacts of an additional 20 years of operation and maintenance of HNP and its associated transmission lines would be SMALL, and further mitigation is not warranted.

4.7 Evaluation of Potential New and Significant Information on Impacts of Operations During the Renewal Term

The staff has not identified new and significant information on environmental issues listed in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 related to operation during the renewal term. The staff reviewed the discussion of environmental impacts associated with operation during the renewal term in the GEIS and the licensee's program for determining new and significant impacts, and has conducted its own independent review, including public scoping meetings, to identify issues with significant new information. Processes for identification and evaluation of new information are described in Chapter 1 under License Renewal Evaluation Process.

4.8 Summary of Impacts of Operations During the Renewal Term

Neither SNC nor the staff is aware of significant new information related to any of the applicable Category 1 issues associated with the HNP operation during the renewal term. Consequently, the staff concludes that the environmental impacts associated with these issues are bounded by the impacts described in the GEIS. For each of these issues, the GEIS concluded that the impacts would be SMALL and that "plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation."

Plant-specific environmental evaluations were conducted for 11 Category 2 issues applicable to HNP operation during the renewal term and for environmental justice. For all these issues, the staff concluded that the potential environmental impact of renewal term operations of HNP would be of SMALL significance in the context of the standards set forth in the GEIS and that mitigation would not be warranted.

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- | In addition, for chronic effects from electromagnetic fields, the staff concluded that a consensus has not been reached by appropriate Federal health agencies that there are adverse effects
- | from electromagnetic fields. The staff considers the GEIS finding of "not applicable" still
- | appropriate, and therefore, no further evaluation of this issue is required.

4.9 References

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance Under the National Environmental Policy Act*. Council on Environmental Quality, Executive Office of the President, Washington, D.C.

Endangered Species Act of 1973, as amended, 16 USC 1531, et seq.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations." 59 *Federal Register* 7629-7633 (1994).

Federal Water Pollution Control Act (FWPCA) of 1977, as amended, 33 USC 1251 et seq. (Also known as the Clean Water Act).

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5.0 Environmental Impacts of Postulated Accidents

Environmental issues associated with postulated accidents were discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a) The GEIS included a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

This chapter describes the environmental impacts from postulated accidents that might occur during the license renewal term.

5.1 Postulated Plant Accidents

A Category 1 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, related to postulated accidents that is applicable to Edwin I. Hatch Nuclear Plant (HNP) is listed in Table 5-1. The Southern Nuclear Operating Company (SNC) stated in its Environmental Report (ER; SNC 2000a) that it is not aware of any new and significant information associated with the renewal of

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

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Table 5-1. Category 1 Issue Applicable to Postulated Accidents During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections
POSTULATED ACCIDENTS	
Design-Basis Accidents (DBAs)	5.3.2; 5.5.1

the HNP operating licenses (OLs). No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to this issue beyond those discussed in the GEIS. For this issue, the GEIS concluded that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, follows.

Design-Basis Accidents (DBAs). Based on information in the GEIS, the Commission found that "The NRC staff has concluded that the environmental impacts of design- basis accidents are of small significance for all plants." The staff has not identified any significant new information during its independent review of the SNC ER, the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of DBAs beyond those discussed in the GEIS.

A Category 2 issue related to postulated accidents that is applicable to HNP is listed in Table 5-2.

Table 5-2. Category 2 Issue Applicable to Postulated Accidents During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
POSTULATED ACCIDENTS			
Severe Accidents	5.3.3; 5.3.3.2 5.3.3.3; 5.3.3.4; 5.3.3.5; 5.4.; 5.5.2	L	5.2

Severe Accidents. Based on information in the GEIS, the Commission found that “The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.”

The staff has not identified any significant new information with regard to the consequences from severe accidents during its independent review of the SNC ER, the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of severe accidents beyond those discussed in the GEIS. However, in accordance with 10 CFR 51.53(c)(3)(ii)(L), the staff has reviewed severe accident mitigation alternatives (SAMAs) for HNP. The results of its review are discussed in Section 5.2.

5.2 Severe Accident Mitigation Alternatives

Title 10 of the Code of Federal Regulations, Part 51.53(c)(3)(ii)(L) requires that license renewal applicants consider alternatives to mitigate severe accidents if the staff has not previously evaluated SAMAs for the applicant’s plant in an environmental impact statement or related supplement or in an environmental assessment. The purpose of this consideration is to ensure that plant design changes with the potential for improving severe accident safety performance are identified and evaluated. SAMAs have not been previously considered for HNP; therefore, the following sections address those alternatives.

5.2.1 Introduction

SNC submitted an assessment of SAMAs for HNP as part of the ER (SNC 2000a). This assessment was based on the *Hatch 1 Probabilistic Safety Assessment* (PSA), Revision 0 (an updated version of the Individual Plant Examination [IPE, SNC 1992]) for core damage frequency (CDF) estimation and containment performance, and a separate Level 3 model for the ER SAMA risk determination. In identifying and evaluating potential SAMAs, SNC considered the insights from the HNP IPE and Individual Plant Examination for External Events (IPEEE, SNC 1996a) as well as several recent SAMA analyses for other plants (Limerick, Watts Bar, and Comanche Peak) and other industry documentation, such as NUREG-1560 (NRC 1997a), NUREG-1462 (NRC 1994a), and the GEIS (NRC 1996; 1999), that discuss potential plant improvements. SNC identified and evaluated 114 SAMA candidates. As discussed below, this list was reduced to 42 unique SAMA candidates because the remainder were either not applicable to boiling-water reactors (BWRs), related to phenomena that are not risk-significant in BWRs, or similar to other SAMAs being considered. Other SAMAs were excluded

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because they had already been implemented at HNP to address insights and recommendations from the HNP PSA and IPE. The study concluded that none of the remaining SAMAs was cost-beneficial.

Based on a review of the SAMA assessment, the NRC issued a request for additional information (RAI) to SNC by letter dated May 30, 2000 (NRC 2000a). Major issues concerned the process used by the license renewal applicant to identify potential SAMAs, the determination and documentation of the risk profile used in the analysis process, the determination of the risk benefits, and the bases for the SAMA implementation costs. SNC submitted additional information by letters dated July 26, 2000 (SNC 2000b), and August 31, 2000 (SNC 2000c), clarifying its approach for SAMA identification, risk quantification and documentation, and SAMA implementation and benefit quantification. This response addressed the staff's concerns and reaffirmed that none of the remaining SAMAs would be cost-beneficial.

An assessment of SAMAs for HNP is presented below.

5.2.2 Estimate of Risk for HNP

- I SNC's estimates of offsite risk at HNP are summarized in Section 5.2.2.1. The summary is
- I followed by a review of SNC's risk estimates in Section 5.2.2.2.

5.2.2.1 SNC's Risk Estimates

The SAMA analysis is based on two distinct analyses: (1) the HNP PSA, Revision 0 (an update of the HNP Probabilistic Risk Assessment (PRA)/IPE model), and (2) a Level 3 analysis developed specifically for the ER SAMA analyses. The HNP PSA is a conversion of the IPE from the "large event tree, small fault tree" approach to the "linked fault tree" approach. The new model incorporated new information on equipment performance, plant configuration changes, and refinements in PRA modeling techniques. It contains a Level 1 analysis to determine the CDF and a Level 2 analysis to determine containment performance during severe accidents. The Level 1 analysis includes only internal events. Although SNC did not include the results of the IPEEE, it did review the IPEEE as part of Phase I of its SAMA evaluation. The total CDF for internal events is $1.6\text{E-}5$ per reactor year (ry) and the Large Early Release Frequency (LERF) is $2.7\text{E-}6/\text{ry}$. The breakdown of CDF is provided in Table 5-3. As shown in this table, the current analyses show that Loss of Feedwater events are a dominant contributor to CDF, followed by Loss of Station Battery A and Loss of Offsite Power.

Table 5-3. HNP Core Damage Frequency Profile

Accident Category	PSA % Total CDF
Loss of Offsite Power	16.7
Loss of 600V AC Bus C	8.4
Loss of Feedwater	20.2
Loss of Station Battery A	18.0
Main Steam Isolation Valve Closure	7.3
Anticipated Transient Without Scram (ATWS)	4.3

The Level 3 analysis uses the MELCOR Accident Consequence Code System 2 (MACCS2) code, Version 1.12, to determine the offsite risk impacts on the surrounding environment and public. Inputs for the Level 3 analysis include the HNP core radionuclide inventory, the Level 2 release fractions, site meteorological data, projected population distribution for the year 2030, emergency response evacuation modeling, and economic data.

SNC estimates the dose to the population within 80 km (50 mi) of the HNP site from internal initiators to be 3.5 person-rem per year. Table 5-4 shows the distribution of containment performance contributions to the population dose. The current submittal indicates that early containment failure releases dominate. The early release category includes Sequence 2, a station blackout event; Sequence 4, a loss of containment heat removal/drywell failure event; and Sequence 11, an ATWS with drywell failure event. As noted by SNC, risk is dominated by Sequence 2 because it is estimated to result in a higher dose (1.9 person-rem) and because it has a relatively high estimate for its probability of occurrence ($1.79 \times 10^{-6}/\text{yr}$).

Table 5-4. Containment Failure Profile

Contributor	Submittal % Contribution to Population Dose
Bypass	5.4
Early	91.2
Late	3.3
Intact (venting)	<0.1

5.2.2.2 Review of SNC's Risk Estimates

SNC's estimate of offsite risk at HNP is based on the HNP PSA and a separate Level 3 MACCS2 analysis. This review considered the following major elements:

- the Level 1 and 2 risk models that form the bases for the December 1992 IPE submittal (SNC 1992)
- the major modifications to the IPE model that have been incorporated in the HNP PSA
- the Level 3 analyses performed to translate fission product release frequencies from the Level 2 PRA model into offsite consequence measures.

Each of these analyses was reviewed to determine the acceptability of SNC's risk estimates for the SAMA analysis, as summarized below.

The staff's review of the HNP IPE is described in an NRC safety evaluation dated July 18, 1995 (NRC 1995). In that review, the staff evaluated the methodology, models, data, and assumptions used to estimate the CDF and characterize containment performance and fission product releases. The staff concluded that SNC's analysis met the intent of Generic Letter 88-20 (NRC 1988); that is, the IPE was of adequate quality to be used to look for design or operational vulnerabilities. Although the staff reviewed certain aspects of the IPE in more detail than others, the review primarily focused on the licensee's ability to examine HNP for severe accident vulnerabilities and not specifically on the detailed findings or quantification estimates. Overall, the staff believed that the HNP IPE was of adequate quality to be used as a tool in searching for areas with high potential for risk reduction and to assess such risk reductions, especially when the risk models are used in conjunction with insights, such as those from risk importance, sensitivity, and uncertainty analyses.

As mentioned earlier, the HNP PSA is an update and conversion of the original IPE submitted to the NRC. It was reviewed by the SNC PSA engineering staff. Because the model was developed from the original IPE, SNC determined that all reviews from the original IPE were still applicable.

A comparison of risk profiles between the original IPE (which was reviewed by the NRC staff) and the current version indicated several changes. First, the overall CDF has decreased. As discussed below, this result is due to several factors. In addition, the dominance of certain events (e.g., Loss of Feedwater, Loss of Station Battery, etc.) has increased, while the importance of other events (e.g., Loss of Offsite Power) has decreased. Nevertheless, the results confirm that the overall risk for the plant is low.

One major group of changes in the model from the IPE to the PSA is the addition of more details to the support system models, especially the electrical systems. However, perhaps the greater impact on the results is due to the conversion of the risk model from the large event tree method to the linked fault tree method. The original IPE fault trees were quantified using very small truncation values to capture as much of the failure probabilities as possible in the event tree split fractions. The event trees were then quantified at much higher truncation values to speed up the quantification process. In the PSA, a single truncation value was used throughout the quantification process. The differences in the quantification methods largely account for the differences in the estimates for the overall CDF and LERF.

The revised CDF estimated for HNP is still comparable to values estimated for other BWR/3 and BWR/4 model plants. Figure 11.2 of NUREG-1560 (NRC 1997a) shows that the total CDFs for these plants range from $9\text{E-}8/\text{ry}$ to $8\text{E-}5/\text{ry}$, with an average value of $2\text{E-}5/\text{ry}$.

SNC submitted an IPEEE by letter dated January 26, 1996 (SNC 1996a), in response to Supplement 4 of Generic Letter 88-20. SNC did not identify fundamental weaknesses or vulnerabilities to severe accident risk in regard to the external events related to seismic, fire, high winds, floods, transportation and nearby facility accidents, and other external hazards. In a letter dated October 23, 2000, the staff concluded that the submittal met the intent of Supplement 4 to Generic Letter 88-20 (NRC 2000b). SNC chose not to include the results of its analysis in the estimate of CDF. In its response to an RAI on how plant-specific external event insights were considered, SNC stated that, based on its review of the HNP IPEEE and NUREG-1560 (NRC 1997a) during Phase I of the SAMA evaluation, it identified three SAMAs associated with external events. Two had already been implemented at HNP and one did not pass the initial screening criteria. The largest CDF contributor examined in the IPEEE was internal fires, which contributed $7.5\text{ E-}06/\text{ry}$ for HNP Unit 1 and $5.4\text{ E-}06/\text{ry}$ for HNP Unit 2. A staff review of the risk-dominant fire zones revealed that the CDF from a fire in a single zone was typically an order of magnitude less than the CDF calculated for internal events. Therefore, there is reasonable assurance that the risk associated with a fire would be bounded by the CDF calculated for internal events. The staff also reviewed the Fire Submittal Screening Review of HNP (an attachment to NRC 2000b) and did not identify additional alternatives that needed to be further evaluated by the applicant. The staff finds SNC's consideration of external events for the purpose of this SAMA review acceptable.

The HNP IPE model included Level 2 components. Hence, the conversion to the linked fault tree method impacted the Level 2 results. Differences in the Level 2 results were also impacted by factors such as: (1) a power uprate, and (2) a new version of the Modular Accident Analysis Program (MAAP) code, which was used to estimate release fractions and provide containment analysis details.

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The process used by SNC to extend the containment performance (Level 2) portion of the PSA to the offsite consequence (Level 3) assessment was reviewed. This included consideration of the source terms used to characterize fission product releases for each containment release mode and the major inputs and assumptions used in the offsite consequence analyses. SNC used Version 3.0B BWR, Revision 10, of the MAAP code to analyze postulated accidents and develop radiological source terms for each of the 15 bins into which the Containment Event Tree endstates had been grouped. In reviewing the submittal, the staff noticed that the predicted timing for various events, and in particular for Sequence 2, which was a dominant contributor to plant risk, differed significantly from MAAP results presented in the IPE. In response to an RAI, SNC clarified that the IPE results were based on calculations using MAAP 3.0B BWR, Revision 8.01. Differences between results for Sequence 2 in the new submittal and the IPE were attributed to changes in MAAP system models (e.g., improved modeling of the automatic depressurization system, which prolongs operation of the reactor core isolation cooling system) and to changes to the MAAP input parameter file to reflect plant modifications (e.g., the power uprate, instrument setpoint modifications, etc.). Source terms calculated for this submittal were incorporated as input to the NRC-developed MACCS2 code.

SNC's point-estimate source term for selected sequences was reviewed and found to either be in reasonable agreement with or higher than the NUREG-1150 (NRC 1990) Peach Bottom estimates for the closest corresponding release scenarios.

The MACCS2 input used site-specific meteorological data processed from measurements taken hourly in 1997. These data were collected at the site meteorological tower. Hence, the meteorological data are applicable to the site. In addition, SNC performed calculations comparing meteorological data for the years 1995 through 1997. Results indicate that 1997 data were conservative for the 3-year period from 1995 through 1997.

The population distribution used as input to the MACCS2 analyses is based on the 1990 sector population data for HNP provided in NUREG/CR-6525 (SECPOP90; NRC 1997b). Transient populations were not considered because of the rural setting of HNP and the small assumed transient population within 80 km (50 mi) of the site. The site-specific growth rates for the period between 1990 and 2000, which were obtained from census information,^(a) were used to estimate a constant growth rate applicable out to 2040. Population growth within a 80-km (50-mi) radius of the site was projected by using the SECPOP90 computer program.

(a) Personal communications on April 2, 1999, between M. Sik, Georgia Governor's Office of Planning and Budget, and J. B. Hovey, Tetra Tech NUS, Inc., Aiken, South Carolina; Subject: 1980 and 1990 Census Counts and 2000 and 2010 Population Projections, 1997 Estimates.

In the original submittal, SNC only projected the population growth out to the end of 2030. At the request of the NRC, SNC projected the population growth out to the end of the license renewal period (2034 for HNP Unit 1 and 2038 for HNP Unit 2), assuming the same constant growth rate. This resulted in a greater population than that used in the SAMA analysis (4 percent higher for 2034 and 8 percent higher for 2038, relative to 2030). Correspondingly, a SAMA analysis using this larger population would result in a 4 percent greater benefit for HNP Unit 1 and an 8 percent greater benefit for HNP Unit 2. However, this would not change the conclusions of the SAMA analyses.

The staff concludes that the above methods and assumptions for the population growth estimates are reasonable and acceptable for the purposes of the SAMA evaluation.

Evacuation modeling was based on a site-specific evacuation study performed by SNC in 1996 (SNC 1996b). SNC assumed that 95 percent of the population within the evacuation zone (extending out to 16 km [10 mi] from the plant) would start moving 45 minutes after declaration of a General Emergency at a radial speed of 2.5 m/s (8.2 ft/s). SNC also assumed that 5 percent of the population would not evacuate. This assumption is conservative relative to the NUREG-1150 study (NRC 1990), which assumed evacuation of 99.5 percent of the population within the emergency planning zone.

In response to an RAI regarding the validity of the evacuation assumption for future years, SNC noted that risk estimates for the HNP site are relatively insensitive to evacuation assumptions because of its rural siting (the 0-16 km [0-10 mi] population is 2 percent of the 0-80 km [0-50 mi] population). Furthermore, SNC observed that conservative assumptions were selected in its evacuation calculations. For example, the assumed evacuation times corresponded to the speed of the slowest subpopulation (special needs persons under adverse conditions), which is approximately half of the evacuation speed indicated for the general population (under adverse conditions).

Evacuation notification is assumed to take place at the times specified for declaring a General Emergency. In a response to an RAI, SNC provided the times at which a General Emergency would be declared. For Level 2 Sequences 4 and 5, these times are simultaneous to the predicted time for the core to be uncovered. For Sequence 2, a General Emergency is declared as soon as the operators realize that they have a station blackout with no possibility of obtaining offsite or on-site power to restore decay-heat-removal systems. In Sequence 11, an ATWS has occurred, the main steam isolation valves have closed and the standby liquid control system has failed to inject. A General Emergency is declared based on a transient occurring with failure of a core shutdown system and containment failure likely. In Sequence 15, there are no water-injection capabilities available. Core damage and vessel failure are unavoidable. A General Emergency is declared when two of the three fission product boundaries (fuel

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cladding, reactor vessel, and containment) have failed and the failure of the third boundary is likely. For these scenarios, the reported times seem reasonable. Hence, the staff concludes that the evacuation assumptions and analysis are reasonable and acceptable for the purposes of the SAMA evaluation.

Site-specific economic data requiring spatial distributions as input to MACCS2 were prepared by specifying the data for each of the 29 counties within 80 km (50 mi) of the plant. The values used in each of the 160 sectors surrounding the plant corresponded to the county that made up a majority of the land in that sector. When no single county represented a majority of the sector, conglomerate data (weighted by the fraction of each county in the sector) were developed. For the remaining economic data, generic data were provided. Agricultural production information was taken from the 1997 Agricultural Census (USDA 1998) and the Atkinson County [Georgia] Extension Service.

The staff concludes that the methodology used by SNC to estimate the CDF and offsite consequences for HNP provides an acceptable basis from which to proceed with an assessment of risk reduction potential for candidate SAMAs. Accordingly, the staff based its assessment of offsite risk on the CDF and offsite doses reported by SNC.

5.2.3 Potential Design Improvements

The process for identifying potential plant improvements, an evaluation of that process, and the improvements evaluated in detail by SNC are discussed in this section.

5.2.3.1 Process for Identifying Potential Design Improvements

SNC's process for identifying potential plant improvements (SAMAs) consisted of the following elements:

- reviews of SAMA analyses submitted in support of original licensing and license renewal activities for other operating nuclear power plants and advanced light-water reactor plants
- reviews of other NRC and industry documentation discussing potential plant improvements
- review of the plant-specific insights from the HNP IPE and IPEEE.

Table 6 in Attachment F to the ER lists the 114 candidate improvements extracted from the above reviews.

SNC performed a qualitative screening of the initial list of SAMAs using the following criteria:

- The SAMA is not applicable to HNP due to design differences (not applicable to the BWR/4/Mk I design).
- The SAMA was related to the mitigation of recirculation pump seal failures or an interfacing system loss-of-coolant accident (ISLOCA). These types of events are not significant risk contributors for BWRs. (See NRC Information Notice 92-36 [NRC 1992] and its supplement [NRC 1994b] for information specifically related to ISLOCAs.)
- The SAMA has already been implemented at HNP (or the HNP design meets the intent of the SAMA).

Based on the qualitative screening, only 42 SAMAs were applicable to HNP and were considered of potential value in averting the risk of severe accidents.

5.2.3.2 Staff Evaluation

SNC's efforts to identify potential SAMAs focused primarily on areas associated with internal initiating events. The initial list of SAMAs generally addressed the accident categories that are dominant CDF contributors or issues that tend to have a large impact on a number of accident sequences at HNP. The preliminary review of SNC's SAMA identification process raised some concerns that plant-specific risk contributors were not fully considered. The staff requested additional plant-specific risk information (dominant minimal cut sets and importance measures) to determine if any significant SAMAs might have been overlooked. The SNC response to the RAI indicated that the insights from the HNP IPE, and not the newer HNP PSA, were used in the identification process. There are a few differences in the final results between the IPE and the PSA, but the list of SAMA candidates appears to address the major contributors to risk for both the IPE and the PSA. Although SNC did not take full advantage of the HNP PSA and the capabilities of the detailed model, it made a reasonable effort to search for potential SAMA candidates, using the knowledge and experience of its PRA personnel; reviewing insights from the IPE, IPEEE, and other plant-specific studies; and reviewing plant improvements in previous SAMA analyses. It should be noted that insights from the IPE have already led to the implementation of numerous potential SAMAs at HNP.

The list of 114 candidate SAMAs strongly focuses on hardware changes that tend to be expensive to implement (of the 114 SAMAs, only about 25 percent involve something other than hardware changes, and only two non-hardware SAMA candidates made it through all the screening to the final analysis). While hardware changes may often provide the greatest risk reduction, consideration should be given to other options that provide marginally smaller risk

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- I reductions with much smaller implementation costs. This is particularly true when the maximum attainable benefit is relatively small. For example, instead of adding redundant direct current (DC) control power for the plant service water (PSW) pumps, making procedural changes to provide better manual control may gain nearly as much benefit with a significantly smaller implementation cost.

This issue was raised in an RAI. In its response, SNC cited 26 SAMA candidates as examples of where actions other than hardware changes were considered. Of these 26 SAMA candidates, only 3 were eligible for screening; 10 were already implemented at HNP, 8 were associated with recirculation pump seal failures or ISLOCAs (both considered to be too insignificant with respect to BWR risk to pursue), 2 were combined with other SAMAs (hardware changes), and 3 were determined to not be applicable to HNP. Thus, of the 42 SAMA candidates that were applicable to HNP and were of potential value in averting the risk of severe accidents, only 3 (about 7 percent) were not hardware changes.

- I The NRC notes that the set of SAMAs submitted is not all inclusive, because additional, possibly even less expensive, design alternatives can always be postulated. However, the staff concludes that the benefits of any additional modifications are unlikely to exceed the benefits of the modifications evaluated and that the alternative improvements would not likely cost less than the least expensive alternatives evaluated, when the subsidiary costs associated with maintenance, procedures, and training are considered. On this basis, the NRC concludes that the set of potential SAMA alternatives identified by SNC is acceptable.

5.2.4 Risk-Reduction Potential of Design Improvements

SNC evaluated the risk-reduction potential of the 42 unique SAMA candidates that were applicable to HNP by first applying a bounding technique. Each SAMA was assumed to completely eliminate all risk. If the implementation costs were greater than the maximum benefit (\$500,000; see Section 5.2.6), then the SAMA was screened from further consideration. If the SAMA could not be screened based on this analysis, then a more refined look at the costs and benefits was warranted.

Using this approach, all but 16 SAMAs were eliminated because the cost was expected to exceed the maximum potential benefit. For each of the 16 remaining SAMA candidates, a more detailed conceptual design was prepared along with a more detailed estimated cost. During this analysis, SNC determined that six of the SAMA candidates were adequately covered by existing plant design and procedures. In addition, the detailed estimation revealed that the cost of one of the candidates (SAMA 41) was greater than the \$500,000 cost associated with the maximum potential risk benefit. SNC dropped these seven SAMA candidates from further consideration. The nine remaining SAMA candidates are listed in Table 5-5.

Table 5-5. Cost-Benefit Results for Potentially Cost-Effective SAMA Candidates

No.	SAMA	Result of Potential Enhancement	CDF Reduction (percent)	P-Rem Reduction (percent)	Total Benefits	Implementation Costs	Net Benefit
9	Add redundant direct current (DC) power for plant service water (PSW) pumps C & D.	Would increase reliability of PSW by reducing frequency of loss of PSW	0.11	0.07	\$500	\$97,000	(\$96,500)
22	Provide reliable power to control building fans.	Would increase availability of control room ventilation upon a loss of power	0.0	0.0	\$0	\$101,000	(\$101,000)
25	Add a diesel building switchgear room high-temperature alarm.	Would improve diagnosis of a loss of switchgear room cooling	0.2	1.2	\$2492	\$100,000	(\$97,508)
46	Use the fire protection system as a backup source for containment spray.	Would provide redundant containment spray function without the cost of installing a new system	0.0	0.01	\$0 ^(a)	\$25,000	(\$25,000)
60	Improve 4.16-kilovolt (kV) bus cross-tie ability.	Would improve alternating current (AC) power reliability	0.0	0.05	\$61	\$100,000	(\$99,939)
73	Use fire protection system as a backup source for diesel cooling.	Would provide a redundant and diverse source of cooling for diesel generators	0.17	1.01	\$2098	\$126,000	(\$123,902)
78	Provide DC power to the 120/240-V vital AC system from station battery instead of its own battery.	Would increase the reliability of the 120-Vac buses	0.0	0.0	\$78	\$106,360	(\$106,282)

(a) Although there would be a non-zero benefit for this SAMA, the value is so low that it is approximately zero.

Table 5-5. (contd)

No.	SAMA	Result of Potential Enhancement	CDF Reduction (percent)	P-Rem Reduction (percent)	Total Benefits	Implementation Costs	Net Benefit
99	Implement internal flood prevention and mitigation enhancements.	Would reduce the consequences of internal flooding	0.03	0.0	\$98	\$325,000	(\$324,902)
105	Proceduralize intermittent operation of the high-pressure coolant injection (HPCI) system.	Would allow extended duration of HPCI availability	0.0	0.0	\$0	\$22,200	(\$22,200)

Note: All benefits and costs are on a per unit basis.

For each of these SAMAs, a risk-reduction analysis was performed. The specific impacts on the CDF and LERF models were identified, the appropriate model elements were changed to reflect the plant or procedure enhancement, and the models were requantified. Table 5-5 shows the percent reductions in the CDF and person-rem public exposure for each SAMA.

The evaluation of the SAMA risk-reduction potentials did not consider uncertainties. The HNP PSA used in the risk-reduction evaluation does not lend itself to propagating uncertainty; therefore, an uncertainty analysis was not performed. The uncertainties in the PSA, risk-reduction estimates, and costs all contribute to uncertainties in the value-impact analyses for each SAMA. Factors of 3 to 5 are common for the Level 1 PSA alone. Even larger uncertainties are common for the Level 2 and Level 3 analyses. However, the margins between the costs and the benefits for the SAMAs presented in Table 5-5 are so large that even if the risk-reduction benefits were a factor of 10 greater, all of the SAMAs would still be eliminated.

The NRC staff concludes that the risk-impact analyses performed for the final nine SAMA candidates were conducted according to accepted PRA practices and are acceptable and appropriate for the SAMA analysis.

5.2.5 Cost Impacts of Candidate Design Improvements

SNC developed a preliminary cost estimate for each of the 42 unique SAMA candidates as part of a cost-screening analysis. The screening criterion was established at a cost of \$500,000 based on the analysis of the maximum potential benefit. Thus, if a SAMA cost more than \$500,000, there was no potential for being cost-beneficial, even if it eliminated all risk.

The preliminary cost estimates were developed to determine which SAMA candidates would clearly cost more than \$500,000 and could readily be dismissed. The cost estimates were based on the total costs associated with performing engineering, procurement, and construction. The cost history for similar modifications at the plant or at other plants was considered in developing the estimates.

Using the \$500,000 screening value, 26 candidate SAMAs were eliminated. For the 16 remaining SAMA candidates, a more detailed conceptual design was prepared along with a more detailed cost estimate based on the same set of cost elements considered before plus training costs. During the detailed analysis, SNC determined that six of the candidate SAMAs were adequately covered by existing plant design and procedures. SNC found that another candidate SAMA was more expensive than the \$500,000 cutoff value. SNC eliminated these seven candidate SAMAs from further consideration. Table 5-5 shows the cost-benefit analysis results for the nine remaining SAMA candidates.

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The cost estimates are reasonable and in most cases are probably conservative (low) in that they do not consider the cost of replacement power during extended outages to implement the modifications, and they do not include contingency costs associated with unforeseen implementation obstacles. Where applicable, costs were determined on a dual-unit basis (rather than doubling a single-unit estimate) to give a more accurate overall cost estimate.

The staff concludes that the cost estimates are sufficient and appropriate for use in the SAMA evaluations.

5.2.6 Cost-Benefit Comparison

The staff's evaluation of SNC's cost-benefit analysis is described in the following sections.

5.2.6.1 SNC Evaluation

The methodology used by SNC was based primarily on NRC's guidance for performing cost-benefit analysis, i.e., *Regulatory Analysis Technical Evaluation Handbook*, NUREG/BR-0184 (NRC 1997c). The guidance involves determining the net value for each SAMA according to the following formula:

$$\text{Net Value} = (\text{APE} + \text{AOC} + \text{AOE} + \text{AOSC}) - \text{COE}$$

where APE = present value of averted public exposure (\$)
AOC = present value of averted offsite property damage costs (\$)
AOE = present value of averted occupational exposure (\$)
AOSC = present value of averted onsite costs (\$)
COE = cost of enhancement (\$)

If the net value of a SAMA is negative, the cost of implementing the SAMA is larger than the benefit associated with the SAMA and it is not considered cost-beneficial. The same analytical approach was used by SNC for the initial screening of the SAMAs. However, for the screening process SNC calculated the maximum averted costs assuming that all severe accident costs were eliminated. SNC's derivation of each of the associated costs is summarized below.

Averted Public Exposure (APE)

SNC called this cost the Offsite Exposure Cost. Averted public exposure costs were calculated using the following formula:

APE = Annual reduction in public exposure (Δ person-rem/ry)
 x monetary equivalent of unit dose (\$2000 per person-rem)
 x present value conversion factor (10.76, based on a 20-year period with a 7 percent discount rate)

As stated in NUREG/BR-0184 (NRC 1997c), it is important to note that the monetary value of the public health risk after discounting does not represent the expected reduction in public health risk due to a single accident. Rather, it is the present value of a stream of potential losses extending over the remaining lifetime (in this case, the renewal period) of the facility. Thus, it reflects the expected annual loss due to a single accident, the possibility that such an accident could occur at any time over the renewal period, and the effect of discounting these potential future losses to present value. For the purposes of initial screening (severe accident costs eliminated), SNC calculated an APE of \$72,565.

Averted Offsite Property Damage Costs (AOC)

SNC called this the Offsite Economic Cost. Averted offsite property damage costs were calculated using the following formula:

AOC = Annual CDF reduction
 x offsite economic costs associated with a severe accident (on a per event basis)
 x present value conversion factor

For the purposes of initial screening (severe accident costs eliminated), SNC cited an annual offsite economic risk of \$9262 based on the Level 3 risk analysis. This results in a discounted value of \$99,659.

Averted Occupational Exposure (AOE) Costs

SNC calls this the Onsite Exposure Cost. Averted occupational exposure costs were calculated using the following formula:

AOE = Annual CDF reduction
 x occupational exposure per core damage event
 x monetary equivalent of unit dose
 x present value conversion factor

SNC derived the values for averted occupational exposure from information provided in Section 5.7.3 of the regulatory analysis handbook (NRC 1997c). Best estimate values provided for immediate occupational dose (3300 person-rem) and long-term occupational dose

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(20,000 person-rem over a 10-year cleanup period) were used. The present value of these doses was calculated using the equations provided in the handbook in conjunction with a monetary equivalent of unit dose of \$2000 per person-rem, a real discount rate of 7 percent, and a time period of 20 years to represent the license renewal period. For the purposes of initial screening (severe accident costs eliminated), SNC calculated an AOE of \$6237.

Averted Onsite Costs (AOSC)

Averted onsite costs include averted cleanup and decontamination costs and averted power replacement costs. Repair and refurbishment costs are considered for recoverable accidents only and not for severe accidents. SNC derived the values for AOSC based on information provided in Section 5.7.6 of the regulatory analysis handbook (NRC 1997c).

SNC divided this cost element into two parts, the Onsite Cleanup and Decontamination Cost (also commonly referred to as averted cleanup and decontamination costs [ACC]) and the replacement power cost (RPC).

Averted cleanup and decontamination costs are calculated using the following formula:

$$\begin{aligned} \text{ACC} = & \text{Annual CDF reduction} \\ & \times \text{present value of cleanup costs per core damage event} \\ & \times \text{present value conversion factor} \end{aligned}$$

I The total cost of cleanup and decontamination subsequent to a severe accident is estimated in the regulatory analysis handbook to be \$1.1E+9 (undiscounted). This value was converted to present costs over a 10-year cleanup period and integrated over the term of the proposed license extension. For the purposes of initial screening (severe accident costs eliminated), SNC calculated an ACC of \$193,973.

Long-term RPC are calculated using the following formula:

$$\begin{aligned} \text{RPC} = & \text{Annual CDF reduction} \\ & \times \text{present value of replacement power for a single event} \\ & \times \text{factor to account for remaining service years for which replacement power is required} \\ & \times \text{reactor power scaling factor} \end{aligned}$$

For the purposes of initial screening (severe accident costs eliminated), SNC calculated an RPC of \$120,041. The total averted cost for the screening process is \$492,476, which SNC rounded up to \$500,000.

SNC Results

The cost-benefit results for the individual analysis of the final nine SAMA candidates are presented in Table 5-5. All of the SAMAs have significantly large negative net values. SNC concluded that implementation of any of these SAMAs is not justified because the costs of implementation greatly exceed the benefits. Therefore, SNC has decided not to pursue any of these SAMAs further.

5.2.6.2 Staff Evaluation

The cost-benefit analysis conducted by SNC was based primarily on the NRC's *Regulatory Analysis Technical Evaluation Handbook* (NRC 1997c). No deviations were found. The staff concludes that the cost of implementing any of the nine SAMAs would far exceed the estimated benefit, with a margin of about a factor of 20. Use of a 3-percent discount rate in place of the 7 percent discount rate used in SNC's analysis would increase net values, but would not lead to the identification of any cost-beneficial SAMAs. Similarly, implementing any of the SAMAs in the near term instead of waiting until the start of the license renewal period (thereby extending the period in the value-impact analysis) would not increase the net benefit sufficiently to make any of the SAMA candidates cost-beneficial.

5.2.7 Conclusions

SNC compiled a list of 114 SAMA candidates using as resources SAMA analyses submitted in support of licensing activities for other nuclear power plants, NRC and industry documents discussing potential plant improvements, and the plant-specific insights from the HNP IPE and IPEEE. A qualitative screening removed those SAMA candidates that (1) did not apply to HNP due to design differences, (2) were related to the mitigation of recirculation pump seal failures or ISLOCAs (not significant risk contributors for BWRs), or (3) had already been implemented at HNP. Only 42 SAMA candidates survived this screening process.

Using the HNP PSA and a Level 3 analysis developed specifically for SAMA evaluations, a maximum obtainable benefit of about \$500,000 was calculated. This value was used as a second screening that eliminated the SAMA candidates whose cost to implement would exceed the maximum obtainable benefit. This process left only 16 SAMA candidates for further analysis.

For each of these 16 SAMA candidates, a more detailed conceptual design and cost estimate were developed. In doing so, SNC determined that six SAMA candidates were adequately covered by existing plant design and procedures and that another would cost more than

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\$500,000 to implement. SNC eliminated these seven SAMA candidates from further consideration. The final nine SAMA candidates were processed through a detailed cost-benefit analysis as shown in Table 5-5.

The cost-benefit analyses showed that none of the final nine SAMA candidates were cost-beneficial and the negative net benefit margins were large. SNC concluded that there was no justification to implement any of the SAMA candidates and decided not to pursue any of the SAMA candidates further.

The staff reviewed the SNC analysis and concluded that the methods used and the implementation of those methods were sound. While there is at least one area of weakness in the analysis (a lack of explicit treatment of uncertainties), the conservative treatment of SAMA benefits and costs, the resulting large negative net benefits, and the inherently small baseline risks support the conclusion that the SAMA evaluations performed by SNC are reasonable and sufficient for the license renewal submittal.

Based on its review of SNC's SAMA analyses, it is the staff's conclusion that none of the candidate SAMAs are cost-beneficial. This conclusion is consistent with the low residual level of risk indicated in the HNP PSA and the fact that HNP has already implemented many plant improvements identified by the IPE and IPEEE.

5.3 References

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6.0 Environmental Impacts of the Uranium Fuel Cycle and Solid Waste Management

Environmental issues associated with the uranium fuel cycle and solid waste management were discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a) The GEIS included a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste (HLW) and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

This chapter addresses the issues that are related to the uranium fuel cycle and solid waste management during the license renewal term that are listed in 10 CFR Part 51, Subpart A, Appendix B, that are applicable to the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2. The generic potential impacts of the radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes are described in detail in the GEIS based, in part, on the generic impacts provided in 10 CFR 51.51(b), Table S-3, "Table of Uranium Fuel Cycle Environmental Data," and in 10 CFR 51.52(c), Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

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Power Reactor.” The GEIS also addresses the impacts from radon-222 and technetium-99. There are no Category 2 issues for the uranium fuel cycle and solid waste management.

6.1 The Uranium Fuel Cycle

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, that are applicable to HNP from the uranium fuel cycle and solid waste management are listed in Table 6-1.

Table 6-1. Category 1 Issues Applicable to the Uranium Fuel Cycle and Solid Waste Management During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B		GEIS Sections
URANIUM FUEL CYCLE AND WASTE MANAGEMENT		
Offsite radiological impacts (individual effects from other than the disposal of spent fuel and HLW)		6.1; 6.2.1; 6.2.2.1; 6.2.2.3; 6.2.3; 6.2.4; 6.6
I Offsite radiological impacts (collective effects)		6.1; 6.2.2.1; 6.2.3; 6.2.4, 6.6
I Offsite radiological impacts (spent fuel and HLW disposal)		6.1; 6.2.2.1; 6.2.3; 6.2.4, 6.6
Nonradiological impacts of the uranium fuel cycle		6.1; 6.2.2.6; 6.2.2.7; 6.2.2.8; 6.2.2.9; 6.2.3; 6.2.4; 6.6
Low-level waste storage and disposal		6.1; 6.2.2.2; 6.4.2; 6.4.3; 6.4.3.1; 6.4.3.2; 6.4.3.3; 6.4.4; 6.4.4.1; 6.4.4.2; 6.4.4.3; 6.4.4.4; 6.4.4.5; 6.4.4.5.1; 6.4.4.5.2; 6.4.4.5.3; 6.4.4.5.4; 6.4.4.6, 6.6
Mixed waste storage and disposal		6.4.5.1; 6.4.5.2; 6.4.5.3; 6.4.5.4; 6.4.5.5; 6.4.5.6; 6.4.5.6.1; 6.4.5.6.2; 6.4.5.6.3; 6.4.5.6.4, 6.6
I Onsite spent fuel		6.1; 6.4.6; 6.4.6.1; 6.4.6.2; 6.4.6.3; 6.4.6.4; 6.4.6.5; 6.4.6.6; 6.4.6.7; 6.6
Nonradiological waste		6.1; 6.5; 6.5.1; 6.5.2; 6.5.3; 6.6
Transportation		6.1; 6.3.1; 6.3.2.3; 6.3.3; 6.3.4; 6.6, Addendum 1

Southern Nuclear Operating Company (SNC) stated in its Environmental Report (ER; SNC 2000) that it is not aware of any new and significant information associated with the renewal of the HNP operating licenses (OLs). No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the staff concluded in the GEIS that the impacts are SMALL (except for collective offsite radiological impacts from the fuel cycle and from HLW and spent fuel disposal, as discussed below), and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

A brief description of the staff review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Offsite radiological impacts (individual effects from other than the disposal of spent fuel and HLW). Based on information in the GEIS, the Commission found that

Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part [10 CFR 51.51(b)]. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small.

The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no offsite radiological impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Offsite radiological impacts (collective effects). Based on information in the GEIS, the Commission found that

The 100 year environmental dose commitment to the U.S. population from the fuel cycle, high level waste and spent fuel disposal is calculated to be about 14,800 person rem [148 person Sv], or 12 cancer fatalities, for each additional 20-year power reactor operating term. Much of this, especially the contribution of radon releases from mines and tailing piles, consists of tiny doses summed over large populations. This same dose calculation can theoretically be extended to include many tiny doses over additional thousands of years as well as doses outside the U.S. The result of such a calculation would be thousands of cancer fatalities from the fuel cycle, but this result assumes that even tiny doses have some statistical adverse health effect which will not ever be mitigated (for example no cancer cure in the next thousand years), and that these doses projected over thousands of years are meaningful. However, these assumptions are

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questionable. In particular, science cannot rule out the possibility that there will be no cancer fatalities from these tiny doses. For perspective, the doses are very small fractions of regulatory limits, and even smaller fractions of natural background exposure to the same populations.

Nevertheless, despite all the uncertainty, some judgement as to the regulatory NEPA [National Environmental Policy Act] implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the collective effects of the fuel cycle, this issue is considered Category 1.

The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no collective impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Offsite radiological impacts (spent fuel and high-level waste disposal). Based on information in the GEIS, the Commission found that

For the high level waste and spent fuel disposal component of the fuel cycle, there are no current regulatory limits for offsite releases of radioactive nuclides for the current candidate repository site. However, if we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, "Technical Bases for Yucca Mountain Standards," and that in accordance with the Commission's Waste Confidence Decision, 10 CFR 51.23, a repository can and likely will be developed at some site which will comply with such limits, peak doses to virtually all individuals will be 100 millirem [1 mSv] per year or less. However, while the Commission has reasonable confidence that these assumptions will prove correct, there is considerable uncertainty since the limits are yet to be developed, no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The NAS report indicated that 100 millirem [1 mSv] per year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 millirem [1 mSv] per year. The lifetime individual risk from 100 millirem [1 mSv] annual dose limit is about 3×10^{-3} .

Estimating cumulative doses to populations over thousands of years is more problematic. The likelihood and consequences of events that could seriously compromise the integrity of a deep geologic repository were evaluated by the Department of Energy in the "Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste," October 1980 [DOE 1980]. The evaluation estimated the 70-year whole-body dose commitment to the maximum individual and to the regional population resulting from several modes of breaching a reference repository in the year of closure, after 1,000 years, after 100,000 years, and after 100,000,000 years. Subsequently, the NRC and other federal agencies have expended considerable effort to develop models for the design and for the licensing of a high level waste repository, especially for the candidate repository at Yucca Mountain. More meaningful estimates of doses to population may be possible in the future as more is understood about the performance of the proposed Yucca Mountain repository. Such estimates would involve very great uncertainty, especially with respect to cumulative population doses over thousands of years. The standard proposed by the NAS is a limit on maximum individual dose. The relationship of the potential new regulatory requirements, based on the NAS report, and cumulative population impacts has not been determined, although the report articulates the view that protection of individuals will adequately protect the population for a repository at Yucca Mountain. However, EPA's generic repository standards in 40 CFR part 191 generally provide an indication of the order of magnitude of cumulative risk to population that could result from the licensing of a Yucca Mountain repository, assuming the ultimate standards will be within the range of standards now under consideration. The standards in 40 CFR part 191 protect the population by imposing "containment requirements" that limit the cumulative amount of radioactive material released over 10,000 years. Reporting performance standards that will be required by EPA are expected to result in releases and associated health consequences in the range between 10 and 100 premature cancer deaths with an upper limit of 1,000 premature cancer deaths worldwide for a 100,000 metric tonne (MTHM) repository.

Nevertheless, despite all the uncertainty, some judgement as to the regulatory NEPA implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high level waste disposal, this issue is considered Category 1.

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The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no collective impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Nonradiological impacts of the uranium fuel cycle. Based on information in the GEIS, the Commission found that "The nonradiological impacts of the uranium fuel cycle resulting from the renewal of an operating license for any plant are found to be small." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no nonradiological impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.
- Low-level waste storage and disposal. Based on information in the GEIS, the Commission found that

The comprehensive regulatory controls that are in place and the low public doses being achieved at reactors ensure that the radiological impacts to the environment will remain small during the term of a renewed license. The maximum additional on-site land that may be required for low-level waste storage during the term of a renewed license and associated impacts will be small. Nonradiological impacts on air and water will be negligible. The radiological and nonradiological environmental impacts of long-term disposal of low-level waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient low-level waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.

The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of low-level waste storage and disposal associated with the renewal term beyond those discussed in the GEIS.

- Mixed waste storage and disposal. Based on information in the GEIS, the Commission found that

The comprehensive regulatory controls and the facilities and procedures that are in place ensure proper handling and storage, as well as negligible doses and exposure to

toxic materials for the public and the environment at all plants. License renewal will not increase the small, continuing risk to human health and the environment posed by mixed waste at all plants. The radiological and nonradiological environmental impacts of long-term disposal of mixed waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient mixed waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.

The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of mixed waste storage and disposal associated with the renewal term beyond those discussed in the GEIS.

- Onsite spent fuel. Based on information in the GEIS, the Commission found that "The expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated on site with small environmental effects through dry or pool storage at all plants if a permanent repository or monitored retrievable storage is not available." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of onsite spent fuel associated with license renewal beyond those discussed in the GEIS.
- Nonradiological waste. Based on information in the GEIS, the Commission found that "No changes to generating systems are anticipated for license renewal. Facilities and procedures are in place to ensure continued proper handling and disposal at all plants." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no nonradiological waste impacts during the renewal term beyond those discussed in the GEIS.
- Transportation. Based on information contained in the GEIS, the Commission found that

The impacts of transporting spent fuel enriched up to 5 percent uranium-235 with average burnup for the peak rod to current levels approved by NRC up to 62,000 MWd/MTU and the cumulative impacts of transporting high-level waste to a single repository, such as Yucca Mountain, Nevada are found to be consistent with the impact values contained in 10 CFR 51.52(c), Summary Table S-4—Environmental

Fuel Cycle

Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor. If fuel enrichment or burnup conditions are not met, the applicant must submit an assessment of the implications for the environmental impact values reported in §51.52.

HNP meets the fuel-enrichment and burnup conditions set forth in Addendum 1 to the GEIS. The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of transportation associated with license renewal beyond those discussed in the GEIS.

6.2 References

10 CFR 51.23, "Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact."

10 CFR 51.51(b), Table S-3, "Uranium fuel cycle environmental data."

10 CFR 51.52(c), Table S-4, "Environmental effects of transportation of fuel and waste to and from one light-water cooled nuclear power reactor."

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste."

National Academy of Sciences (NAS). 1995. *Technical Bases for Yucca Mountain Standards*. Washington, D.C.

National Environmental Policy Act (NEPA) of 1969, as amended, 42 USC 4321, et seq.

Southern Nuclear Operating Company (SNC). 2000. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage, Edwin I. Hatch Nuclear Plant*.

U.S. Department of Energy (DOE). 1980. *Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste*. DOE/EIS 00046-G, Vols. 1-3, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437, Vol. 1, Addendum 1, Washington, D.C.

7.0 Environmental Impacts of Decommissioning

Environmental issues associated with decommissioning resulting from continued plant operation during the renewal term were discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a) The GEIS included a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required. There are no Category 2 issues related to decommissioning at Edwin I. Hatch Nuclear Plant (HNP).

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to HNP decommissioning following the renewal term are listed in Table 7-1. The Southern Nuclear Operating Company (SNC) stated in its Environmental Report (ER; SNC 2000) that it is not aware of any new and significant information associated with the renewal of the HNP operating licenses (OLs). No significant new information has been identified by the staff during its review. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the staff concluded in the GEIS that the impacts are SMALL, and plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table 7-1. Category 1 Issues Applicable to the Decommissioning of HNP Following the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1		GEIS Sections
DECOMMISSIONING		
Radiation Doses		7.3.1; 7.4
Waste Management		7.3.2; 7.4
Air Quality		7.3.3; 7.4
Water Quality		7.3.4; 7.4
Ecological Resources		7.3.5; 7.4
Socioeconomic Impacts		7.3.7; 7.4

A brief description of the staff's review and the GEIS conclusions, as codified in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, for each of the issues follows:

- I • Radiation doses. Based on information in the GEIS, the Commission found that "Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem [0.01 person-Sv] caused by buildup of long-lived radionuclides during the license renewal term." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no radiation doses associated with decommissioning following license renewal beyond those discussed in the GEIS.
- I • Waste management. Based on information in the GEIS, the Commission found that "Decommissioning at the end of a 20-year license renewal period would generate no more solid wastes than at the end of the current license term. No increase in the quantities of Class C or greater than Class C wastes would be expected." The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff's site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of solid waste associated with decommissioning following the license renewal term beyond those discussed in the GEIS.

- Air quality. Based on information in the GEIS, the Commission found that “Air quality impacts of decommissioning are expected to be negligible either at the end of the current operating term or at the end of the license renewal term.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of license renewal on air quality during decommissioning beyond those discussed in the GEIS. |
- Water quality. Based on information in the GEIS, the Commission found that “The potential for significant water quality impacts from erosion or spills is no greater whether decommissioning occurs after a 20-year license renewal period or after the original 40-year operation period, and measures are readily available to avoid such impacts.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of the license renewal term on water quality during decommissioning beyond those discussed in the GEIS. |
- Ecological resources. Based on information in the GEIS, the Commission found that “Decommissioning after either the initial operating period or after a 20-year license renewal period is not expected to have any direct ecological impacts.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of the license renewal term on ecological resources during decommissioning beyond those discussed in the GEIS. |
- Socioeconomic impacts. Based on information in the GEIS, the Commission found that “Decommissioning would have some short-term socioeconomic impacts. The impacts would not be increased by delaying decommissioning until the end of a 20-year relicense period, but they might be decreased by population and economic growth.” The staff has not identified any significant new information during its independent review of the SNC ER (SNC 2000), the staff’s site visit, the scoping process, its review of public comments, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of license renewal on the socioeconomic impacts of decommissioning beyond those discussed in the GEIS. |

7.1 References

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

Southern Nuclear Operating Company (SNC). 2000. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage, Edwin I. Hatch Nuclear Plant.*

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC) 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants.* NUREG-1437, Vol. 1, Addendum 1, Washington, D.C.

8.0 Environmental Impacts of Alternatives to License Renewal

This chapter examines the potential environmental impacts associated with denying a renewed operating license (OL) (i.e., the no-action alternative); the potential environmental impacts from electric generating sources other than renewal of the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2 OLs; the potential impacts from instituting additional conservation measures to reduce the total demand for power; and the potential impacts from power imports. The impacts are evaluated using a three-level standard of significance—SMALL, MODERATE, or LARGE—based on Council on Environmental Quality (CEQ) guidelines. These significance levels are as follows:

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.

8.1 No-Action Alternative

For license renewal, the no-action alternative refers to a scenario in which the U.S. Nuclear Regulatory Commission (NRC) would not renew the HNP OLs, and the applicant would then decommission HNP when plant operations cease. Replacement of HNP electricity generation capacity would be met either by (1) demand-side management and energy conservation (perhaps supplied by an energy service company), (2) imported power, (3) some generating alternative other than HNP, or (4) some combination of these. However, due to the influence of the ongoing deregulation of the retail market, Southern Nuclear Operating Company (SNC) might not be the ultimate power supplier. SNC discussed the environmental impacts of the no-action alternative in its Environmental Report (ER; SNC 2000).

SNC will be required to comply with NRC decommissioning requirements whether or not the OLs are renewed. If the HNP OLs are renewed, decommissioning activities may be postponed for up to an additional 20 years. If the licenses are not renewed, then SNC would begin decommissioning activities when plant operations cease, beginning in 2014 and 2018 for HNP Units 1 and 2, respectively, or perhaps sooner. The impacts of decommissioning would occur concurrently with the impacts of supplying replacement power. The *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996;

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1999)^(a) and the *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities*, NUREG-0586 (NRC 1988), describe decommissioning activities.

The environmental impacts associated with decommissioning under the no-action alternative would be bounded by the discussion of impacts in Chapter 7 of the GEIS, Chapter 7 of this supplemental environmental impact statement (SEIS), and NUREG-0586 (NRC 1988). The impacts of decommissioning after 60 years of operation generally would not be significantly different from those occurring after 40 years of operation.

- **Socioeconomic:** When HNP ceases operation, there will be a decrease in employment and tax revenues associated with the closure. These impacts would be concentrated in Appling and Toombs counties and to a lesser degree in Montgomery, Tattnal, and Jeff Davis counties. Most secondary employment impacts and impacts on population would be concentrated in Appling and Toombs counties, with lesser impacts in the other three counties. Table 2-7 shows the current geographic distribution of HNP employees by county.

Table 2-15 shows the tax contribution of HNP to Appling County, where the plant is located. Most of the tax revenue losses resulting from closure of HNP would occur in Appling County. In 1998, HNP contributed about \$8.5 million to Appling County, or 68 percent of all taxes collected by the county. The no-action alternative results in the loss of these taxes and payrolls 20 years earlier than if the licenses are renewed (Table 8-1).

Table 8-1. Summary of Environmental Impacts of the No-Action Alternative

Impact Category	Impact	Comment
Socioeconomic	LARGE	Decrease in employment, higher-paying jobs, and tax revenues
Historic and Archaeological Resources	SMALL to LARGE	Sale or transfer of land within plant site leads to changes in land-use pattern
Environmental Justice	MODERATE to LARGE	Loss of employment opportunities and social programs

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

HNP provided approximately 12 million megawatt hours (MWh) of electricity in 1997 to customers in Georgia via the Georgia Power Company (GPC) electric grid that serves approximately 1.7 million customers in a 148,000 km² (57,000 mi²) area of the State. The 12 million MWh represents approximately 12 percent of the electricity generated in the State of Georgia in 1997 (SNC 2000). Under the no-action alternative, energy costs in the area may be higher in a regulated utility environment.

It is clear from the staff's interviews with local real estate agents and appraisers that there would be a significant adverse impact on housing values, the local economy, and employment if HNP were to close. The loss of payrolls, workers, and taxes would be substantial, and would adversely affect Appling and Toombs counties in particular. Schools in Appling County would be impacted severely because a significant percentage of the revenues collected from taxes are used to support the schools in the county. In Toombs County, a number of textile firms left the county in the 1990s, further depressing local employment opportunities for county residents. South-central Georgia, where HNP is located, is a region of the State that is economically disadvantaged when compared to other parts of Georgia, such as Atlanta or Savannah.

SNC employees at HNP currently contribute time and money toward community involvement, including schools, churches, and other civic activities. It is likely that with a reduced presence in the community following decommissioning, SNC's community involvement efforts in the bi-county region would be lessened.

The property of the HNP site totals approximately 910 ha (2240 acres) with approximately 540 ha (1340 acres) in Appling County and the remaining 360 ha (900 acres) in Toombs County. The restricted industrial area of the site, containing the reactors, containment building, switchyard, cooling area, and associated facilities, occupying approximately 120 ha (300 acres), is located in Appling County. Approximately 650 ha (1600 acres) of the site are managed for timber production and wildlife habitat. There are recreational facilities on the site available for use, with permission, by residents of Toombs and Appling counties. These facilities may be lost if the license renewal application is not approved, and the HNP units are decommissioned and the plant site is developed, sold, or used for other purposes.

- Historic and Archaeological Resources: The potential for future adverse impacts to unrecorded historic and archaeological resources at the HNP site following decommissioning will depend on the future use of the site land. Known cultural activities include the current Visitors Center and associated interpretative efforts that are funded and maintained by SNC. Eventual sale or transfer of the land within the plant site could result in adverse impacts on these resources should the land-use pattern change.

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- Environmental Justice for No-Action: Current operations at HNP do not have disproportionate impacts on minority and low-income populations of the surrounding counties, and no environmental pathways have been identified that would cause disproportionate impacts. Because closure would result in a significant decrease in employment opportunities and tax revenues in Appling and Toombs counties, it is possible that the counties' ability to maintain social services could be reduced at the same time as diminished economic conditions reduce employment prospects for the minority or low-income populations. Negative and disproportionate impacts on minority or low-income populations from this source under the no-action alternative are possible.

8.2 Alternative Energy Sources

Nuclear power plants are commonly used for base-load generation; the GEIS indicates that coal-fired and gas-fired generation capacity are the feasible alternatives to nuclear-power generation capacity, based on current (and expected) technological and cost factors. The alternatives of coal-fired generation and gas-fired generation are presented (in Sections 8.2.1 and 8.2.2, respectively) as if such plants were constructed at the HNP site. If construction takes place on the existing HNP site, SNC expects to use the existing water-intake and discharge structures, switchyard, and transmission lines. However, construction could take place at an alternate location. Such a location could be either a current industrial site or an undisturbed, pristine site requiring a new generating building and facilities, new switchyard, and at least some new transmission lines. Construction of the coal-fired or gas-fired generation facility at a new site could impact up to approximately 450 ha (1100 acres) (SNC 2000). For purposes of this SEIS, a "greenfield" site is assumed to be an undisturbed, pristine site.

Depending on the location of an alternative site, it might also be necessary to provide a connection to the nearest gas pipeline (in the case of natural gas) or rail connection (in the case of coal). The requirement for these additional facilities likely would also increase the environmental impacts relative to those that would be experienced at the existing HNP site.

The cooling water needs of a fossil-fired plant of equal capacity to HNP would be provided by a closed-loop cooling system using the existing cooling towers at the HNP site. Water-use volume would be approximately 110,000 m³/d (30 million gpd), which is less than the 216,000 m³/d (57 million gpd) used by the existing HNP (SNC 2000).

The potential for using imported power is discussed in Section 8.2.3. In 1995, Georgia was a substantial net seller of electricity. During 1995, the net interstate flow of electricity was 15 million MWh, or about 15 percent of all electricity produced in Georgia (SNC 2000). During 1996, SNC facilities in Georgia (including those of subsidiaries Georgia Power and Savannah Electric) generated approximately 90 percent (90 million MWh) of the power in Georgia. HNP

generated approximately 13 million MWh during 1996 (SNC 2000). Even though Georgia is a net exporter of electricity, SNC does not discount the option of importing electric power depending on economic conditions within a deregulated market.

Several other technologies were considered, but were determined not to be reasonable replacements for a nuclear power plant. These options included wind, solar, hydropower, geothermal, wood energy, municipal solid waste, biomass-derived fuels, oil, advanced nuclear, fuel cells, delayed retirement of other generating units, and utility-sponsored conservation as discussed in Section 8.2.4. Some of the alternatives in this section are technically feasible, but could not provide enough power on their own to replace the power from HNP. The final section considers the environmental consequences of a mix of alternatives. These impacts are the same as or larger than the environmental consequences of relicensing.

8.2.1 Coal-Fired Generation

It was assumed that it would take 1800 MW(e) of coal-fired generation capacity to replace the 1690 MW(e) of HNP, Units 1 and 2. The increased size over current HNP capacity would be necessary to offset increased internal electrical usage for auxiliary pollution control, pumping water for cooling, and coal and ash handling (SNC 2000). This alternative could consist of three 600-MW(e) units, each of which would be 60 m (200 ft) tall and could be tangentially fired with dry-bottom boilers.

Construction of the coal-fired alternative would take approximately 5 years. The workforce during the construction period would average 1500, with a peak of 2000, and during operations would average 250.

The assumptions and most numerical values used in the following descriptions were provided in the SNC ER (SNC 2000). The staff reviewed this information and used it in the analysis of environmental impacts.

8.2.1.1 Closed-Cycle Cooling System

Closed-cycle cooling would be the most likely cooling system if the existing HNP site were used. The plant would use the existing HNP intake, discharge structures, and cooling towers as part of a closed-loop cooling system. This alternative would minimize environmental impacts, because minimal construction would be required to adapt the existing system to the coal-fired alternative. It is assumed that the coal-fired alternative would require a water-use volume (including cooling water, wet scrubber sulfur oxides emission controls, and boiler make-up) of approximately 110,000 m³/d (30 million gpd), which would be less than the existing HNP withdrawal of approximately 216,000 m³/d (57 million gpd). Based on the design and efficiency

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of the existing cooling towers, discharge temperatures would be less than or equal to those currently observed. The overall impacts of this system are discussed in the following sections. The impacts are summarized in Table 8-2.

Table 8-2. Summary of Environmental Impacts of Coal-Fired Generation—Closed-Cycle Cooling

Impact Category	HNP Site		Alternative Greenfield Site	
	Impact	Comments	Impact	Comments
Land Use	MODERATE	Uses approximately 360 ha (900 acres) including land for the plant, coal storage, and ash and scrubber sludge disposal	MODERATE to LARGE	610 ha (1500 acres), including transmission lines and rail line for coal delivery (assuming site is within 16 km (10 mi) of the nearest railway connection
Ecology	MODERATE to LARGE	Uses undeveloped areas in current HNP site plus other nearby land, plus rail corridor	MODERATE to LARGE	Impact will depend on ecology of site
Water Use and Quality				
- Surface Water	SMALL	Uses existing intake and discharge structures Volume 110,000 m ³ /d (30 million gpd) and temperature rise less than HNP	SMALL to MODERATE	Impact will depend on volume and other characteristics of receiving water
- Groundwater	SMALL	Little groundwater is currently used at HNP. This practice likely would continue	SMALL to LARGE	Impact will depend on site characteristics and availability of groundwater
Air Quality	MODERATE	Sulfur oxides – 3300 MT/yr (3600 tons/yr) – allowances may be required Nitrogen oxides – 1550 MT/yr (1710 tons/yr) – allowances may be required Particulate – 220 MT/yr (filterable) (240 tons/yr) – 49 MT/yr (un-filterable – PM ₁₀) (54 tons/yr) Carbon monoxide – 1060 MT/yr (1170 tons/yr) Trace amounts of mercury, arsenic, chromium, beryllium, selenium	MODERATE	Potentially same impacts as HNP site, although pollution control standards may vary

Table 8-2. (contd)

Impact Category	HNP Site		Alternative Greenfield Site	
	Impact	Comments	Impact	Comments
Waste	MODERATE	Total waste volume would be estimated around 1.4 million MT/yr (1.5 million tons/yr) of ash and scrubber sludge; land devoted to waste disposal is approximately 240 ha (600 acres)	MODERATE	Same impacts as HNP site; waste disposal constraints may vary
Human Health	SMALL	Impacts considered minor	SMALL	Same impact as HNP site
Socioeconomics	MODERATE to LARGE	1200 to 2000 additional workers during peak period of the 5-year construction period, followed by reduction from current HNP workforce of 950 to 250; tax base preserved	MODERATE to LARGE	Depends on whether alternate site outside of Appling County. If outside, construction impacts would be relocated. Appling County would experience loss of tax base and employment.
	SMALL	For transportation, the impact is considered SMALL. The area is very rural; 20 train trips per week for coal and lime; 115 cars per train. Plant workforce less, so commuting impacts less than current HNP site situation	SMALL to MODERATE	For transportation, the impact is considered SMALL to MODERATE and will vary depending on plant location
Aesthetics	SMALL to MODERATE	Visual impact of power plant units and stacks that would be visible from offsite; noise impacts minimized by site location	MODERATE to LARGE	Alternate locations could reduce aesthetic impact if siting is in an industrial area; large if siting is largely in undeveloped area
Historic and Archeological Resources	SMALL	Affects previously developed parts of current HNP site; cultural resource inventory should minimize any impacts on undeveloped lands	SMALL	Alternate location would necessitate cultural resource studies
Environmental Justice	MODERATE	Impacts on minority and low-income communities should be similar to those experienced by the population as a whole. Some impacts on housing may occur during construction; loss of 700 jobs in a economically depressed county could reduce employment prospects for minority and low-income populations	SMALL to LARGE	Impacts will vary depending on population distribution and makeup

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• Land Use

The existing facilities and infrastructure at the HNP site would be used to the extent practicable, limiting the amount of new construction that would be required. Specifically, it is assumed that the alternatives would use the existing intake and discharge structures, switchyard, offices, and transmission line rights-of-way. This is done primarily to minimize the predicted environmental impacts of these alternatives during construction. Using existing intake and discharge structures could also reduce operational impacts because it is reasonable to assume that aquatic communities in the immediate vicinity of the plant have already adapted to HNP patterns of water withdrawal and thermal discharge. Construction of new intake and discharge structures at a new site would necessitate aquatic community adaptations at the new site, adding to the environmental impact of the alternatives.^(a) By using existing structures such as these, the environmental impact of construction would be reduced.

The coal-fired generation alternative would necessitate converting roughly an additional 360 ha (900 acres) of the HNP site to industrial use (plant, coal storage, and ash and scrubber sludge disposal). Currently, most of this land is forested. These changes would noticeably alter the current HNP site land-use patterns and would have a MODERATE environmental impact. Additional land-use changes would likely occur in an undetermined coal-mining area outside of the HNP site region of influence because of the mining necessary to supply coal for the plant.

Bituminous coal is the most common coal burned in coal-fired units because of its higher heating values. Coal would have a heating value of 13,000 British thermal units (Btus) per pound, an ash content of 10 percent, and a sulfur content of 0.8 percent. A maximum of 14,100 metric tons (MT) (15,500 tons) of coal and 800 MT (880 tons) of lime/limestone per day would be delivered by railcar on the existing rail spur that serves the HNP site.

Coal for the plant would be delivered by rail trains of 115 cars each. Each open-top rail car holds about 90 MT (100 tons) of coal. An additional 65 rail cars per week would be required to deliver the lime for plant operations. In all, approximately 520 trains per year, or an average of 10 trains each week, would deliver the coal and lime for all three units. Because there is an empty train for each full train delivery, a total of 20 train trips per week are expected.

(a) Additionally, it is reasonable to assume that construction and operations at a new site would mean that intake and discharge at the HNP site would stop, necessitating adaptation of the HNP site aquatic communities to the change in their environment.

Approximately 1.4 million MT (1.5 million tons) of coal-combustion by-products per year (ash and scrubber sludge) would be disposed of onsite, requiring approximately 240 ha (600 acres) for a by-product disposal area.^(a) Facilities would be constructed to control and treat leachate from coal storage areas and ash and scrubber sludge disposal areas. The existing switchyard and transmission system would be used. It is assumed that coal-fired generation structures and facilities, including coal storage and ash and scrubber sludge disposal areas, would all be located within the current HNP site boundaries.

The impact of a coal-fired generating unit on land use at the existing HNP site is best characterized as MODERATE. The impact would definitely be greater than the license renewal alternative.

Construction of the coal-fired generation alternative at a new site could impact up to 610 ha (1500 acres). In addition to the 360 ha (900 acres) needed for the plant, coal storage, and ash and scrubber sludge disposal areas, an additional 60 ha (150 acres) would be required for offices, roads, parking areas, and a switchyard. Cooling-water intake and discharge structures and mechanical or natural-draft cooling towers would have to be constructed. An additional 120 ha (300 acres) would be needed for transmission lines, assuming the plant is sited 16 km (10 mi) from the nearest substation. Approximately 70 ha (160 acres) would also be needed for a rail line for coal delivery, assuming that the alternative site location is within 16 km (10 mi) of nearest railway connection. Depending particularly on transmission line and rail line routing, this alternative would result in MODERATE to LARGE land-use impacts.

• Ecology

Locating an alternate energy source at the existing HNP site would noticeably alter ecological resources because of the need to convert roughly 360 ha (900 acres) of established forested land to industrial use (plant, coal storage, and ash and scrubber sludge disposal). The use of an existing intake and discharge system, to which the area aquatic communities have become acclimated, would limit operational impacts. Siting at the existing HNP site would have a MODERATE to LARGE ecological impact that would be greater than license renewal.

(a) While only half of these values are directly attributable to the alternative of a 20-year HNP license renewal, the total values are pertinent as a cumulative impact over the estimated 40-year operating life of the plant.

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Even at another existing power plant site, adding the HNP coal-fired generation alternative would introduce construction impacts and new incremental operational impacts. At a greenfield site (an undisturbed, pristine area), the impacts would certainly alter the ecology. Impacts would include wildlife habitat loss and reduced productivity, and could include habitat fragmentation and a local reduction in biological diversity. These ecological impacts would be MODERATE to LARGE.

• Water Use and Quality

Surface water. The coal-fired generation alternative is assumed to use the existing HNP intake and discharge structures as part of a closed-loop cooling system. This alternative would minimize environmental impacts because minimal construction would be required to adapt the system to the coal-fired alternative. It is assumed that the coal-fired alternative would require a water-use volume (including cooling water, wet scrubber sulfur oxides emission controls, and boiler make-up) of approximately 110,000 m³/d (30 million gpd), which would be less than the existing HNP withdrawal of approximately 216,000 m³/d (57 million gpd). Based on the design and efficiency of the existing cooling towers, discharge temperatures would be less than or equal to those currently observed. This in turn would comply with the existing HNP National Pollutant Discharge Elimination System (NPDES) permit. The GEIS analysis determined that surface-water quality, hydrology, and use impacts for license renewal would be SMALL. Because the coal-fired generation alternative is assumed to have the same discharge characteristics as the existing HNP, surface-water impacts are expected to remain SMALL; the impacts would be so minor that they would not noticeably alter any important attribute of the resource.

For alternative greenfield sites, the impact on the surface water would depend on the volume associated with the cooling system and characteristics of the receiving body of water. The impacts would be SMALL or MODERATE.

Groundwater. Groundwater use under the coal-fired alternative will not be significantly different than under current operations at HNP. The reduced work force size for the coal-fired alternative (from 950 down to 250) would reduce the groundwater withdrawals for potable water use. Assuming 0.13 m³/d (35 gpd) per person, maximum groundwater usage would be approximately 33 m³/d (8750 gpd), or approximately 93 m³/d (24,500 gpd) less than under the license renewal option.

However, the leachate from ash and scrubber waste disposal areas and the runoff from coal storage areas would have to be controlled to avoid groundwater and surface-water contamination. For this reason, the appropriate characterization of coal-fired generation

groundwater impacts would be SMALL; the impacts would be so minor that they would not noticeably alter any important attribute of the resource.

For alternative greenfield sites, the impact on the groundwater would depend on the site characteristics, including the amount of groundwater available. The impacts would range between SMALL and LARGE.

- **Air Quality**

Currently, Appling County is in attainment with all of the Federal ambient standards for criteria pollutants (particulates, ozone, nitrogen dioxide, lead, sulfur oxides, and carbon monoxide). The air-quality impacts of coal-fired generation vary considerably from those of nuclear power due to emissions of sulfur oxides (SO_x), nitrogen oxides (NO_x), particulates, carbon monoxide, and mercury. Impacts for particular pollutants are described below. The impacts are based on estimates in SNC's ER (SNC 2000), which the staff reviewed.

Sulfur oxides emissions. Using current control technology for sulfur oxides emissions, the total annual stack emissions would include approximately 3300 MT (3600 tons) of SO_x, most of which would be sulfur dioxide (SO₂) (SNC 2000). Additional reductions could become necessary. The acid rain provision of the Clean Air Act (CAA, Sections 403 and 404) set a limit for the nation's SO₂ emissions from power plants. Under the CAA, affected fossil-fired steam units are allocated a number of SO₂ emission allowances. To achieve compliance, each utility must hold enough allowances to cover its SO₂ emissions annually or be subject to certain penalties. If the utility's SO₂ emissions are less than its annually allocated emission allowances, then the utility may bank the surplus allowances for use in future years. An SO₂ allowances market has been established for the buying and selling of allowances. –

To build and operate a coal-fired generation alternative beginning in the year 2014 at the HNP site, GPC would have to purchase sufficient SO₂ allowances for the HNP-alternative plant or increase SO₂ removal efficiency such that purchase of SO₂ allowances is not required. Thus, a major new combustion facility would not add to net regional emissions, although it might do so locally. Regardless, SO_x emissions would be greater than the license renewal alternative.

Nitrogen oxides emissions. Using currently available control technology, the total annual NO_x emission of a new coal-fired power plant would be approximately 1550 MT (1710 tons). This level of NO_x emissions would be greater than the OL renewal alternative. Section 407 of the CAA establishes technology-based emission limitations for NO_x emissions. The market-based allowance system used for SO₂ emissions is not used for NO_x emissions. A

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new coal-fired power plant would be subject to the new source performance standards for such plants as set forth in 40 CFR 60.44a(d)(1).

Particulate emissions. The total estimated annual stack emissions would include 220 MT (240 tons) of filterable particulates and 49 MT (54 tons) of matter having a diameter of 10 microns or less (PM_{10}). In addition, coal-handling equipment would introduce fugitive particulate emissions. These emissions are more than the license renewal alternative.

Carbon monoxide emissions. The total carbon monoxide emissions would be approximately 1060 MT (1170 tons) per year, which is more than the license renewal alternative.

Mercury. Coal-fired boilers account for nearly one-third of mercury emissions in the United States. Technologies available to control mercury emissions have varying degrees of success. In response to growing concerns about mercury, the CAA Amendments of 1990 require EPA to identify mercury emission sources, evaluate the contributions of power plants and municipal incinerators, identify control technologies, and evaluate the toxicological effects from the consumption of mercury-contaminated fish.

On December 20, 2000, the U.S. Environmental Protection Agency (EPA) issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000a). EPA determined that coal- and oil-fired electric utility steam-generating units are significant emitters of hazardous air pollutants, including mercury and other toxic pollutants (EPA 2000b, p. 79828). The EPA concluded that mercury is the hazardous air pollutant of greatest concern. Accordingly, EPA added coal- and oil-fired electric utility steam-generating units to the list of source categories under section 112(c) of the CAA for which emission standards for hazardous air pollutants will be issued. A new coal-fired power plant would be subject to the new regulations when they are promulgated by EPA.

The EPA studies also found that certain segments of the U.S. population (e.g., developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures resulting from consumption of contaminated fish (EPA 2000b, p. 79830).

There is no subsistence eating of fish among the population of Appling and Toombs counties. Concentrations of mercury are likely to be small and with the forthcoming regulations will be controlled. Therefore, the probable effect of trace mercury emissions on human health from the coal-fired alternative would be SMALL, although larger than the license renewal alternative.

Summary. The GEIS analysis did not quantify coal-fired emissions, but implied that air impacts would be substantial and mentioned global warming and acid rain as potential impacts. Adverse human health effects from coal combustion have led to important Federal legislation in recent years, and public health risks, such as cancer and emphysema, have been associated with the products of coal combustion. Federal legislation and large-scale concerns, such as acid rain and global warming, are indications of concerns about air resources. SO_x emission allowances, NO_x emission offsets, low NO_x burners, overfire air, selective catalytic reduction, fabric filters or electrostatic precipitators, and scrubbers may be required as mitigation measures. As such, the appropriate characterization of coal-fired generation air impacts at the HNP site would be MODERATE. The impacts would be clearly noticeable, but would not destabilize air quality.

Siting the coal-fired generation elsewhere would not significantly change air quality impacts, although it could result in installing more or less stringent pollution control equipment to meet applicable standards. Therefore, the impacts would be MODERATE.

- **Waste**

Coal combustion generates waste in the form of ash, and equipment for controlling air pollution generates additional ash and scrubber sludge. Three 600-MW(e) coal-fired plants at the HNP site would generate approximately 1.4 million MT (1.5 million tons) of this waste annually for 40 years. The waste would be disposed of onsite, accounting for 240 ha (600 acres) of land area. While only half of these values are directly attributable to the alternative to a 20-year HNP license renewal, the total values are pertinent as a cumulative impact. This impact could extend well after the 40-year operation life because revegetation management and groundwater monitoring for leachate contaminant impacts could be a permanent requirement.

The GEIS analysis concluded that large amounts of fly ash and scrubber sludge would be produced and would require constant management. Disposal of this waste could noticeably affect land-use and groundwater quality, but with appropriate management and monitoring, it would not destabilize any resources. After closure of the waste site and revegetation, the land would be available for other uses, and regulatory requirements would ensure groundwater protection. For these reasons, the appropriate characterization of impacts from waste generated from burning coal would be MODERATE; the impacts would be clearly noticeable, but would not destabilize any important resource.

Siting the facility on an alternate greenfield site would not alter waste generation, although other sites might have more constraints on disposal locations. Therefore, the impacts would be MODERATE.

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• Human Health

Coal-fired power generation introduces worker risks from fuel and lime/limestone mining, and worker and public risks from fuel and lime/limestone transportation and stack-emissions inhalation. Stack impacts can be very widespread and health risks difficult to quantify. This alternative also introduces the risk of coal-pile fires and attendant inhalation risks.

The GEIS analysis noted that there could be human health impacts (cancer and emphysema) from inhalation of toxins and particulates, but did not identify the significance of these impacts. Regulatory agencies, such as the EPA, focus on air emissions and have revised regulatory requirements or proposed statutory changes, based on human health impacts. Such agencies also impose site-specific emission permit limits as needed to protect human health. Thus, human health impacts from inhaling toxins and particulates generated by burning coal would be SMALL.

Using the same logic, siting the facility at an alternate greenfield site would not alter the expected human health effects. Therefore, the impacts would be SMALL.

• Socioeconomics

Construction of the coal-fired alternative would take approximately 5 years. It is assumed that construction would take place concurrently while the existing nuclear units continue operation and would be completed at the time HNP would cease operations. Thus, the workforce would be expected to average 1500 with a peak of 2000 additional workers during the 5-year construction period. The surrounding communities would experience demands on housing and public services that could have LARGE impacts. After construction, the communities would be impacted by the loss of jobs; construction workers would leave, the nuclear plant workforce (950) would decline through a decommissioning period to a minimal maintenance size, and the coal-fired plant would introduce only 250 new jobs.

The GEIS analysis of socioeconomic impacts at a rural site such as HNP would be larger than at an urban site because more of the 1500-to-2000 peak construction workforce would need to move to the area to work. Operational impacts could result in moderate socioeconomic benefits in the form of several hundred jobs, tax revenue, and plant expenditures. However, on a comparison basis, these benefits would be less than those achieved through HNP license renewal.

The size of the construction workforce for a coal-fired plant and plant-related spending during construction would be very noticeable. Operational impacts, once the coal-fired replacement plants are constructed and the nuclear plants decommissioned, would result in

an eventual loss of approximately 700 high-paying jobs (950 for two nuclear units down to 250 for the coal-fired plant), with a commensurate reduction in demand on socioeconomic resources and contribution to the regional economy. The partial replacement of industrial tax base with that from the coal-fired power plant would help stabilize some of the loss of tax base associated with the nuclear units. For these reasons, the appropriate characterization of socioeconomic impacts for a coal-fired plant would be MODERATE to LARGE; the impacts would be clearly noticeable, but would not destabilize any important resource.

Construction at another site would relocate some socioeconomic impacts, but would not eliminate them. The community around HNP would still experience the impact of HNP's operational job loss, and the communities around the new site would have to absorb the impacts of a large, temporary workforce and a moderate, permanent workforce. Therefore, the impacts are MODERATE to LARGE, based on the adverse effects on the employment and the tax base in Appling and Toombs counties.

For transportation related to coal and lime delivery, the impacts are considered SMALL. Approximately 520 trains per year, or an average of 10 trains each week, would deliver the coal and lime for all three units. Because there is an empty train for each full train delivery, a total of 20 train trips is expected per week, or at least 2.6 trips per day. On several days per week, there could be three trains per day using the rail spur to the HNP site. Coal and lime delivery would occur during daylight hours.

The industrial spur rail line serving the HNP site is currently not in use, and the Norfolk Southern rail line is used four times per day. Therefore, the use of rail for coal/lime delivery would not affect other rail use in the vicinity of the site. The rail line spur from the main railroad to HNP crosses U.S. Highway 341 and U.S. Highway 1, in addition to several county roads. Based on the use of a 115-car coal train with three locomotives, and assuming a speed of 32 km/hr (20 mph) through the town of Baxley and approaching the site, the affected at-grade crossing intersections are estimated to be blocked for about 5 minutes per train trip. For two train trips per day, this equates to two separate 5-minute periods for each highway, separated by the time (4.5 hours) necessary to unload the rail cars. HNP is located in a mostly rural area and the roads are lightly traveled. Therefore, two separate 5-minute periods each day are expected to have a SMALL effect on vehicular traffic in the area.

Impacts from relocating the plant to a greenfield site would depend on where the new site is located. If the greenfield site were located in a rural setting, such as the current HNP site, then the impacts would be considered SMALL. If it were located in a more crowded suburban area, they could be considered MODERATE.

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- I For transportation related to commuting by plant operating personnel, the impacts are also considered SMALL. HNP is operated on a continuous basis (i.e., 24 hours per day, every day, except when downtime for maintenance, inspection, etc., is required). The maximum number of plant operating personnel would be approximately 250 (SNC 2000). The current HNP workforce is approximately 950. Therefore, traffic impacts associated with commuting plant personnel would be expected to be SMALL compared to the current impacts from HNP operations. Impacts from relocation at a greenfield site could be SMALL to MODERATE depending on the site location—rural or suburban—and the existing transportation infrastructure at the new location.

- **Aesthetics**

The three power plant units, which could be as much as 60 m (200 ft) tall, would be visible over intervening trees for miles around. The three 180-m (600-ft) stacks could be visible at a distance of approximately 6.5 km (4 mi) during the summer and approximately 16 km (10 mi) in the winter. In contrast, the existing HNP reactor buildings and single main exhaust stack are 60 m (200 ft) and 120 m (393 ft) tall, respectively (SNC 2000). The existing mechanical draft cooling towers are approximately 18 m (60 ft) tall. The addition of three 180-m (600-ft) stacks for the coal-fired alternative would contrast with what is otherwise the natural-appearing rural area, with woods and farming areas, and would be a MODERATE visual aesthetic impact compared to the existing HNP facility; noticeable but not destabilizing.

Coal-fired generation would introduce additional mechanical sources of noise that would be audible offsite. Sources contributing to total noise produced by plant operation are classified as continuous or intermittent. Continuous sources include the mechanical equipment (e.g., induced-draft fans and mechanical-draft cooling towers) associated with normal plant operations. Intermittent sources include the equipment related to coal handling, solid-waste disposal, transportation related to coal and lime delivery, and the commuting of plant employees (SNC 2000). The incremental noise impacts of a coal-fired plant compared to existing HNP operation are considered to be SMALL to MODERATE. Further, because of the location of the facility and the effects of shielding by physical barriers (e.g., coal pile, buildings, intervening trees, or other physical barriers), the impacts of noise offsite would be limited (SNC 2000).

Coal and lime delivery would be expected to result in some noise impacts on residents living in the vicinity of the facility and along the rail route. Normally coal is delivered and unloaded during daylight hours. The existing rail spur has historically had infrequent use, with smaller unit trains being the predominant type of rail use. Delivery of coal and lime would add a new noise source for receptors along the rail corridor. Although noise from passing trains

significantly raises noise levels near the rail corridor, the short duration of the noise reduces the impact. Therefore, the impacts of noise on residents in the vicinity of the facility and the rail line would be considered SMALL.

Alternative site locations could reduce the aesthetic impact of coal-fired generation if siting were in an area that was already industrialized. In such a case, however, the introduction of such tall stacks and cooling towers would probably still have a MODERATE incremental impact. Locating at other, largely undeveloped sites could show a LARGE impact.

- **Historic and Archaeological Resources**

The GEIS analysis concluded that impacts to cultural resources would be relatively SMALL unless important site-specific resources were affected. Under this alternative, cultural resource inventories would be required for any lands that have not been previously disturbed. Other lands that are purchased to support the facility would also require an inventory of field cultural resources, identification and recording of extant historic and archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Coal-fired generation at HNP would not directly affect cultural resources. Therefore, the impacts would be SMALL.

Construction at another site would necessitate studies to identify, evaluate, and mitigate potential impacts of new plant construction on cultural resources. This would be required for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, or other rights-of-way). These impacts can generally be managed and maintained and as such are considered SMALL.

- **Environmental Justice**

No environmental pathways have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement coal-fired plant were built at the HNP site. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect the minority and low-income populations. Closure of the HNP units would result in a decrease in employment of 700 employees in Appling and Toombs counties. It is possible that the counties' ability to maintain social services could be reduced at the same time as diminished

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economic conditions reduce employment prospects for the minority or low-income populations. Impacts at other sites would depend upon the site chosen. These impacts would be MODERATE.

If the replacement plant was built in Appling County, the county's tax base would be largely maintained, and some potential negative socioeconomic impacts on the minority or low-income populations would be avoided. If the plant was built elsewhere, environmental justice impacts could be SMALL to LARGE, depending on the plant location and nearby population distribution.

8.2.1.2 Once-Through Cooling System

This section discusses the environmental impacts of converting the current HNP closed-cycle cooling system to once-through cooling. Realistically this would not occur at the current HNP site due to the infrastructure currently in place for a closed-cycle system with the existing nuclear units. If SNC switched from closed-cycle to once-through cooling, such a conversion would most likely take place at a greenfield site with sufficient water resources to support the system.

Generally, the impacts (SMALL, MODERATE, or LARGE) of this option are the same as the impacts for a coal-fired plant using the close-cycle system. However, there are minor environmental differences between the closed-cycle and once-through cooling system. Table 8-3 summarizes the incremental differences.

Given that the once-through cooling system would most likely be constructed at a new greenfield site, the differences noted in Table 8-3 should be compared with the Alternative Greenfield Site column in Table 8-2.

8.2.2 Gas-Fired Generation

It was assumed that a replacement natural gas-fired plant would use combined-cycle technology. In the combined-cycle unit, hot combustion gases in a combustion turbine rotate the turbine to generate electricity. Waste combustion heat from the combustion turbine is routed through a heat-recovery steam generator to generate additional electricity. The size, type, and configuration of gas-fired generation units and plants currently operational in the United States vary and include simple-cycle combustion and combined-cycle units that range in size from 25 MW(e) to 600 MW(e) (EPA 1994). As with coal-fired technology, units may be configured and combined at a location to produce the desired amount of electricity, and construction can be phased to meet electrical power needs.

Section 8.2.2.1 discusses the environmental impacts of converting the current HNP site to a natural gas-fired generation facility with a closed-cycle cooling and building a similar facility on a greenfield site. (The assumptions and numerical values used in the following description were provided in the SNC ER [SNC 2000]. The staff reviewed this information and used it in the analysis of the environmental impacts.)

Table 8-3. Summary of Environmental Impacts of Coal-Fired Generation with the Alternate Cooling System—Once-Through Cooling

Impact Category	Change in Impacts from HNP Closed-Cycle Cooling System
Land Use	Reservoir or other sufficient cooling resource required
Ecology	Impact would depend on ecology at the site
Water Use and Quality	
- Surface Water	Increased water withdrawal, thermal load higher
- Groundwater	None
Air Quality	None
Waste	None
Human Health	None
Socioeconomics	None
Aesthetics	Elimination of cooling towers
Historic and Archaeological Resources	None
Environmental Justice	None

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8.2.2.1 Closed-Cycle Cooling System

The primary source of information used to describe and scale for size (megawatt and land use) for the gas-fired alternative is the EPA documentation for the Tampa Electric Company Polk Power Station. The Polk facility is typical of current available gas-fired technology being constructed and operated today. In addition, information from the EPA (EPA 1993) and U.S. Department of Energy's (DOE's) Energy Information Administration (EIA) technical publications (DOE 2000) on fuel specifications and best available emission-control technology was used to specify fuel types and emission-control technology that would be used in the gas-fired alternative. In some cases, SNC used referenced data directly; in other cases, SNC appropriately scaled data to fit the size plant needed for an HNP alternative energy source.

For the purposes of this SEIS, it is assumed that it would take 1760-MW(e) of gas-fired generation to replace the existing 1690-MW(e) HNP units. The increase in generating capacity would be necessary to offset increased internal electrical usage for pollution control and pumping water for cooling, but would not be as great as for the coal-fired alternative due to reduced cooling-water flow and pollution-control needs.

The SNC gas-fired generation alternative consists of four 440-MW(e) (International Standards Organization rating) combined-cycle units each consisting of two 155-MW(e) simple-cycle combustion turbines and a 130-MW(e) heat-recovery steam generator. On an average annual basis, these units would generate up to 440 MW(e) each, providing the 1760 MW(e) needed to replace HNP-generated power.

Natural gas, typically having an average heating value of 1000 Btu/ft³, would be the primary fuel. The gas-fired plant would burn approximately 283,000 m³ (10 million ft³) per hour. Low-sulfur No. 2 fuel oil would be the backup fuel. Natural gas would be delivered via an existing pipeline located approximately 7 km (4.5 mi) from the HNP site. Approximately 20 to 50 ha (55 to 121 acres) would be disturbed during pipeline construction. The existing line currently has sufficient reserve capacity to supply the needs of the gas-fired alternative (SNC 2000).

Each unit would be less than 30 m (100 ft) high and would be designed with dry, low NO_x combustors, water injection, and selective catalytic reduction, and would exhaust through a 70-m (230-ft) stack after passing through heat-recovery steam generators. The 70-m (230-ft) height is based on good engineering practice formulas using the tallest proposed onsite facility (i.e., the 28-m [92-ft] turbine building). While modeling would have to be used to justify stack height greater than 70 m (230 ft), the relatively flat terrain and low structures of the area probably mean that modeling would not support a greater stack height.

NO_x emissions from the gas-fired alternative would be 350 MT/yr (386 tons/yr). There would be no solid waste products (i.e., ash) from natural gas fuel burning.

The plant would use the existing HNP intake and discharge and the existing mechanical cooling towers. Cooling requirements would be less; average withdrawal flows would be approximately 57,000 m³/d (15 million gpd).

Construction of the gas-fired alternative would take approximately 3 years and the workforce during the construction period would average 500, with a peak of 750. The workforce during operations would average 125.

The overall impacts of this system are discussed in the following sections. The impacts are summarized in Table 8-4.

- **Land Use**

Gas-fired generation at the HNP site would require converting an additional 200 ha (500 acres) of the site to industrial use (SNC 2000). Currently, this land is mostly forested. An additional 20 to 50 ha (55 to 121 acres) would be disturbed during pipeline construction but, because this disturbance would be temporary and would not alter existing land-use patterns (access road right-of-way and cultivation), the land-use impacts from pipeline construction would be SMALL. These changes in aggregate would noticeably alter current HNP land-use patterns and would create MODERATE impacts; the impact would noticeably alter habitat but would not destabilize any important attribute of the resource.

Construction of the gas-fired generation plant at a new site could impact approximately 240 ha (600 acres). In addition to the 200 ha (500 acres) needed for the power block area and pipeline construction described above, approximately 40 ha (100 acres) would be required for offices, roads, parking areas, and a switchyard. In addition, approximately 120 ha (300 acres) would be needed for transmission lines, assuming the plant is sited 16 km (10 mi) from the nearest substation (SNC 2000). Plants of this type are usually built very close to existing natural gas pipelines. Including the land required for pipeline construction, a greenfield site would require approximately 360 ha (900 acres). The greenfield site alternative could result in MODERATE land-use impacts.

The GEIS estimated that land-use requirements for a 1000-MW gas-fired plant at a greenfield site would be SMALL (approximately 45 ha [110 acres] for the plant site), and that co-locating with a retired nuclear plant would reduce these impacts. The HNP land-use estimate exceeds the GEIS estimate, even factoring in the fact that the SNC plants are

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**Table 8-4. Summary of Environmental Impacts of Gas-Fired Generation—
Closed-Cycle Cooling**

HNP Site			Alternative Greenfield Site	
Impact Category	Impact	Comments	Impact	Comments
Land Use	MODERATE	Additional 200 ha (500 acres) for power block, 20 to 50 ha (55 to 121 acres) disturbed for gas pipeline; land disturbed currently forested and would be in addition to land already disturbed onsite; additional land for backup oil storage tanks	MODERATE	360 ha (900 acres) for power block, offices and transmission lines; additional land for backup oil storage tanks
Ecology	MODERATE to LARGE	Constructed on cleared land adjacent to HNP site on approximately 200 ha (500 acres); habitat loss	MODERATE to LARGE	Impact depends on location and ecology of the site; potential habitat loss and fragmentation; reduced productivity and biological diversity
Water Use and Quality				
- Surface Water	SMALL	75% reduction in water flow compared to existing HNP use	SMALL to MODERATE	Impact depends on volume and characteristics of receiving body of water
- Groundwater	SMALL	Reduced groundwater withdrawals due to reduced workforce	SMALL to LARGE	Groundwater impacts would depend on use and available supply
Air Quality	MODERATE	Primarily NO _x – 350 MT/yr (386 tons/yr) with gas; 265 MT/yr (290 tons/yr) with flue gas-recirculation. – emissions less than coal-fired alternative	MODERATE	Same impacts as for HNP site
Waste	SMALL	Small amount of ash produced	SMALL	Same impacts as for HNP site
Human Health	SMALL	Impacts considered to be minor	SMALL	Same impacts as for HNP site

Table 8-4. (contd)

HNP Site			Alternative Greenfield Site	
Impact Category	Impact	Comments	Impact	Comments
Socioeconomics	MODERATE	500 to 750 additional workers during 3-year construction period; followed by reduction from 950 persons to 125 persons; tax base sustained with new gas-fired plant replacing HNP	MODERATE to LARGE	Construction impacts would be relocated. Appling and Toombs counties would experience workforce reduction, plus loss of tax base if plant locates outside county
	SMALL	Transportation impacts are considered SMALL because there is less commuting workforce than current HNP or coal-fired alternative	SMALL	Transportation impacts would depend on population density and transportation infrastructure, but generally would be SMALL due to workforce size (125)
Aesthetics	SMALL to MODERATE	Visual impact of stacks and equipment would be noticeable, but not as significant as coal option or existing HNP reactor building and stack	SMALL to MODERATE	Alternate locations could reduce the aesthetic impact if siting is in an industrial area
Historic and Archaeological Resources	SMALL	Plant footprint less than coal-fired alternative; site knowledge minimizes possible cultural impacts	SMALL	Alternate location would necessitate cultural resource preservation measures
Environmental Justice	SMALL to MODERATE	Impacts on minority and low-income populations should be similar to those experienced by the population as a whole. Impacts on housing are possible during construction; loss of 825 high-paying jobs might lessen employment opportunities for minority and low-income populations.	SMALL to LARGE	Impacts vary depending on population distribution and makeup; impacts to Appling County could be MODERATE to LARGE if new plant built outside of county

considerably larger. The land-use change would noticeably alter the overall site pattern for natural land use, particularly if such land is wooded and would have to be cleared prior to constructing the plant and associated facilities. The impacts are considered MODERATE, depending on the length and routing of required pipelines and transmission lines.

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- **Ecology**

Roughly 200 ha (500 acres) of established forest land would need to be converted to industrial use if the gas-fired units are sited at the existing HNP site. This is in addition to the cleared land devoted to the nuclear units even though some of the land currently devoted to the nuclear power plant operations may be used in the gas-fired generation scenario. Ecological impacts would also be minimized by using the existing cooling water intake and discharge system.

The GEIS noted that land-dependent ecological impacts from construction would be **SMALL** unless site-specific factors indicate a particular sensitivity and that operational impacts would be smaller than for other fossil fuel technologies of equal capacity. The staff has identified the conversion of 200 ha (500 acres) of forested land to industrial use as one of these site-specific impacts. Thus, siting at the existing HNP site would have a **MODERATE** to **LARGE** ecological impact and would definitely be more adverse to the environment than the proposed relicensing alternative.

I At a greenfield site, the impacts would certainly alter the ecology and could impact threatened and endangered species. These ecological impacts could be **MODERATE** to **LARGE**. Impacts would include wildlife habitat loss and reduced productivity, and could include habitat fragmentation and a local reduction in biological diversity.

- **Water Use and Quality**

Surface water. The plant would use the existing HNP intake and discharge structures as part the cooling system; however, cooling requirements would be less (75 percent reduction over existing HNP use—approximately 57,000 m³/d [15 million gpd] would be used for condenser cooling and to meet existing limitations on discharge temperatures [SNC 2000]). Because existing limitations on discharge temperatures would be met, water-quality impacts would continue to be **SMALL**.

Water-quality impacts from sedimentation during construction was another land-related impact that the GEIS categorized as **SMALL**. The GEIS also noted that operational water-quality impacts would be similar to, or less than, those from other centralized generating technologies. The staff has concluded that water-quality impacts from coal-fired generation would be **SMALL**, and gas-fired alternative water usage would be less than that for coal-fired generation. Surface-water impacts would remain **SMALL**; the impacts would not be detectable or would be so minor that they would not noticeably alter any important attribute of the resource.

For alternative greenfield sites, the impact on surface water would depend on the volume and other characteristics of the receiving body of water. The impacts would be SMALL to MODERATE.

Groundwater. Groundwater use under the gas-fired alternative will not be significantly different than under current operations at HNP. The reduced workforce size (from 950 to 125) would reduce groundwater withdrawals for potable water use. The groundwater impacts would be very SMALL; i.e., the impacts would be so minor that they would not noticeably alter any important resource.

For alternative greenfield sites, the impact to the groundwater would depend on the site characteristics, including the amount of groundwater available. The impacts would range between SMALL and LARGE.

- **Air Quality**

Natural gas is a relatively clean-burning fuel. NO_x emissions from the gas-fired alternative would be 350 MT/yr (386 tons/yr). By comparison, NO_x emissions, assuming flue gas re-circulation, would be 265 MT/yr (290 tons/yr) (SNC 2000). New CAA provisions might result in SNC having to further reduce NO_x by shutting other sources down or by modifying plants to reduce NO_x formation (e.g., installing over-fired air, low NO_x burners, flue gas re-circulation, and selective non-catalytic and catalytic reduction systems). Precise reduction requirements are speculative at this time (SNC 2000).

The GEIS noted that gas-fired air-quality impacts are less than other fossil technologies because fewer pollutants are emitted, and SO_x is not emitted at all. Emissions from the gas-fired alternative would be less than emissions from the coal-fired alternative. However, the GEIS also noted, as did SNC, that the gas-fired alternative would contribute NO_x emissions to an area that in the future may become a non-attainment area for ozone. Because NO_x contribute to ozone formation, the reduced NO_x emissions are still of future concern, and low NO_x combusters, water injection, and selective catalytic reduction could become regulatory-imposed mitigation measures.

For these reasons, the appropriate characterization of air impacts from a gas-fired plant would be MODERATE; the impacts, primarily NO_x, would be clearly noticeable, but would not be sufficient to destabilize air resources as a whole at this time.

Alternatives

Siting the gas-fired plant elsewhere would not significantly change air-quality impacts because the site could also be located in a greenfield area that was not a serious non-attainment area for ozone. In addition, the location could result in installing more or less stringent pollution control equipment to meet the regulations. Therefore, the impacts would be MODERATE.

- **Waste**

There will be only small amounts of solid-waste products (i.e., ash) from burning natural gas. The GEIS concluded that waste generation from gas-fired technology would be minimal. Gas firing results in very few combustion by-products because of the clean nature of the fuel. Waste generation would be limited to typical office wastes. This impact would be SMALL; waste-generation impacts would be so minor that they would not noticeably alter any important resource attribute.

Siting the facility at an alternate greenfield site would not alter the waste generation; therefore, the impacts would continue to be SMALL.

- **Human Health**

The GEIS analysis mentions potential gas-fired alternative health risks (cancer and emphysema). The risk may be attributable to NO_x emissions that contribute to ozone formation, which in turn contribute to health risks. As discussed in Section 8.2.1 for the coal-fired alternative, legislative and regulatory control of the Nation's emissions and air quality are protective of human health. The impacts of the gas-fired alternative on human health would be SMALL; that is, human health effects would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.

Siting of the facility at an alternate greenfield site would not alter the human health effects that would be expected. Therefore, the impacts would be SMALL.

- **Socioeconomics**

The GEIS concluded that socioeconomic impacts from constructing a gas-fired plant would not be very noticeable and that the small operational workforce would have the lowest socioeconomic impacts (local purchases and taxes) of any nonrenewable technology. Compared to the coal-fired alternative, the smaller size of the construction workforce, the shorter construction time frame, and the smaller size of the operations workforce would all reduce some of the socioeconomic impacts. For these reasons, gas-fired generation

socioeconomic impacts themselves would be SMALL to MODERATE; that is, depending on other growth in the area, socioeconomic effects could be noticed, but they would not destabilize any important attribute of the resource.

For HNP, it is assumed that construction of new gas-fired generating facilities would take place while HNP continues operation, with completion at the time that the nuclear units would halt operations. Therefore, for the 3-year construction period, the site would have between 500 and 750 additional workers. During this time, the surrounding communities would experience demands on housing and public services that could have large impacts. After construction, the communities would be impacted by the loss of jobs; construction workers would leave, the nuclear plant workforce (of 950 workers) would decline through a decommissioning period to a minimal maintenance size, and the gas-fired plant would introduce a replacement tax base and only 125 new jobs. Socioeconomic impacts from start of construction through nuclear plant decommissioning would be MODERATE because of the loss of jobs from HNP.

Construction at another site would relocate some socioeconomic impacts, but would not eliminate them. The community around the HNP site would still experience the impact of the loss of HNP operational jobs and the tax base. The communities around the new site would have to absorb the impacts of a moderate, temporary workforce and a small, permanent workforce. Therefore, the impacts would be MODERATE to LARGE, based on net job and tax-base losses.

With respect to transportation, the HNP workforce (of 950 workers) would decline and the gas-fired plant would introduce only 125 new jobs. Therefore, traffic impacts associated with commuting plant personnel would be expected to be less than the current impacts from HNP operations and would be SMALL. The impact of relocating the plant to a new greenfield site would also be considered SMALL because of the small workforce size associated with the gas-fired plant.

- **Aesthetics**

The combustion turbines and heat-recovery boilers would be relatively low structures, less than 30 m (100 ft) tall, and would be screened from most offsite vantage points by intervening woodlands. The steam turbine building would be taller, approximately 46 m (150 ft) in height, and, together with the exhaust stacks (70 m [230 ft] in height), would be visible offsite. The use of these facilities along with the existing mechanical-draft cooling towers and associated facilities, would have less visual impact than the existing HNP reactor building and stack, which are considerably taller (60 m [200 ft] and 120 m [393 ft] tall, respectively) (SNC 2000).

Alternatives

The GEIS analysis noted that land-related impacts, such as aesthetic impacts, would be small unless site-specific factors indicate a particular sensitivity. As in the case of the coal-fired alternative, aesthetic impacts from the gas-fired alternative would be noticeable. However, because the gas-fired structures are shorter than the coal-fired structures and more amenable to screening by vegetation, the staff concluded that the aesthetic resources would not be destabilized by the gas-fired alternative. For these reasons, the appropriate characterization of aesthetic impacts from a gas-fired plant would be SMALL to MODERATE; the impacts would be clearly noticeable, but would not destabilize this important resource.

Alternative locations could reduce the aesthetic impact of gas-fired generation if siting were in an area that was already industrialized. In such a case, however, the introduction of the steam generator building, stacks, and cooling-tower plumes would probably still have a SMALL to MODERATE incremental impact.

- **Historic and Archaeological**

Gas-fired generation at HNP would not directly affect cultural resources (SNC 2000). The GEIS analysis noted that cultural resource impacts associated with the gas-fired alternative would be small unless important site-specific resources were affected. Gas-fired alternative construction at the HNP site would affect a smaller area within the footprint of the coal-fired alternative. As discussed in Section 8.2.1, site knowledge minimizes the possibility of cultural resource impacts. Impacts on cultural resources would be SMALL; that is, the effects would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.

Construction at another, alternative site could necessitate instituting cultural resource preservation measures (power block area or transmission line right-of-way), but impacts to cultural resources could generally be managed and kept SMALL. Cultural resource studies would be required for the pipeline construction and any other areas of ground disturbance associated with this alternative.

- **Environmental Justice**

No environmental pathways have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement gas-fired plant was built at the HNP site. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect the minority or low-income populations. The impacts would be SMALL to MODERATE. Impacts at other sites would depend upon the site chosen. If the replacement plant was built in Appling

County, the county's tax base would be largely maintained, and some potential negative socioeconomic impacts on the minority or low-income populations would be avoided. If the plant was built elsewhere, outside of Appling County, then the environmental justice impacts of losing the plant would be LARGE. The impacts to the other areas would be SMALL to LARGE, depending on the population distribution.

8.2.2.2 Once-Through Cooling System

This section discusses the environmental impacts of converting the current HNP closed-cycle cooling system to once-through cooling. Realistically, this would not occur at the current HNP site due to the infrastructure currently in place for a closed-cycle system with the existing nuclear units. If SNC switched from closed-cycle to once-through cooling, such a conversion would most likely take place at a greenfield site with sufficient water resources to support the system.

The impacts (SMALL, MODERATE, or LARGE) of this option are the same as the impacts for a gas-fired plant using the closed-cycle system. However, there are minor environmental differences between the closed-cycle and once-through cooling systems. Table 8-5 summarizes the incremental differences. Given that the once-through cooling system would most likely be constructed at a new greenfield site, the differences noted in Table 8-5 should be compared with the Alternative Greenfield Site column in Table 8-4.

8.2.3 Imported Electrical Power

SNC adopts by reference, as representative of the environmental impacts of the imported electrical power alternative to HNP license renewal, the GEIS discussion of environmental impacts from generic alternatives.

"Imported power" means power purchased and transmitted from electric power-generation plants that the applicant does not own and that are located elsewhere within the region, United States, or Canada. Georgia is a net exporter of electric power (SNC 2000). However, SNC cannot discard imported power as a feasible alternative to HNP license renewal. Market conditions, particularly the anticipated free market created by deregulation, could result in a company finding it advantageous to import power to replace a retired Georgia plant while exporting other power generated in the State (SNC 2000). SNC assumes that if it did import power to replace HNP-generated capacity, the power would be generated elsewhere using one or more of the technologies that NRC discusses in GEIS, Chapter 8. SNC has no basis for estimating which generation technology, or which mix of technologies, would be used other than to point to the currently available mix of technologies. Thus, importing (purchasing) additional power is a feasible alternative to SNC license renewal.

Alternatives

Table 8-5. Summary of Environmental Impacts of Gas-Fired Generation With the Alternate Cooling System—Once-Through Cooling

Impact Category	Change in Impacts from HNP Closed-Cycle Cooling System
Land Use	Reservoir or other sufficient cooling resource required
Ecology	Impact would depend on ecology at the site
Water Use and Quality	
- Surface Water	Increased water withdrawal, thermal load higher
- Groundwater	None
Air Quality	None
Waste	None
Human Health	None
Socioeconomics	None
Aesthetics	Elimination of cooling towers
Historic and Archaeological Resources	None
Environmental Justice	None

According to the DOE EIA's International Energy Outlook 1998 (DOE 1997),

Hydro Quebec has targeted the U.S. market for future sales growth. Hydro Quebec currently owns Vermont Gas and has signed a deal with Enron to market electricity in the Northeast while selling Enron's gas in Quebec. In April 1997, Hydro Quebec petitioned the FERC (Federal Energy Regulatory Commission) to sell electricity in the United States. In return, it would allow U.S. competitors to wheel electricity into Quebec. In November 1997, Hydro Quebec received FERC approval to sell power in the United States at market-based rates.

Depending on transmission availability, relative power costs, whether Canadian environmental and aboriginal rights controversies over the hydroelectric James Bay Project in Northern Quebec can be solved, and whether appropriate transmission agreements and facilities could be put in place, Hydro Quebec could be a future source of imported power. However, there could be significant environmental impacts in Northern Quebec.

Regardless of the technology used to generate imported power, the generating technology would be one of those described in this SEIS and in the GEIS (probably coal, natural gas, nuclear, or Canadian hydroelectric). The description of the environmental impacts of other technologies in GEIS, Chapter 8 is representative of the imported electrical power alternative to HNP license renewal. Thus, the environmental impacts of imported power would still occur but would be located elsewhere within the region, nation, or Canada.

8.2.4 Other Alternatives

Other commonly known generation technologies considered by NRC are listed in the following sections. However, these sources have been eliminated as "reasonable alternatives" to the proposed action because the generation of 1690 MW(e) of electricity as a base-load supply using these technologies is not technologically feasible (NRC 1996).

8.2.4.1 Wind

Wind speeds in central and eastern Georgia (Macon and Savannah data) average 12 km/hr (7.8 mph) (SNC 2000), whereas average wind speeds of more than 21 km/hr (13 mph) are required for wind turbines to generate electricity. Regions with wind speeds of this magnitude include the Great Plains, the West, coastal areas, and parts of the Appalachians, including a small area of northeast Georgia (SNC 2000). The staff concludes that locating a wind-energy facility on or near the HNP site would not be feasible given the current state of the technology.

Based on the GEIS land-use estimate for wind power,^(a) replacement of HNP generating capacity, even assuming ideal wind conditions, would require the dedication of almost 109,000 ha (270,000 acres) or 1090 km² (422 mi²). The current HNP site is about 910 ha (2240 acres), and Appling County, in which the facility is located, is about 1330 km² (514 mi²) (SNC 2000). The size of the site needed eliminates the possibility of co-locating a wind facility at the HNP site even if such technology were technological feasible. Locating the technology at an alternative greenfield site could be undertaken, but the required land-use resources would be large and potentially ecologically disruptive. Thus, based on the lack of adequate wind speeds and the amount of land that would be required for wind-powered generating facilities,

(a) GEIS Section 8.3.1 estimates 150,000 acres per 1000 MW(e) for wind power.

Alternatives

- I the staff has concluded that the wind alternative is not feasible at a greenfield site. A wind
- I power alternative would require a large greenfield site, resulting in a LARGE environmental impact.

8.2.4.2 Solar

Solar power technologies, photovoltaic and thermal, cannot currently compete with conventional fossil-fueled technologies in grid-connected applications due to higher capital costs per kilowatt of capacity (DOE 2000). The average capacity factor of photovoltaic cells is about 25 percent, and the capacity factor for solar thermal systems is about 25 percent to 40 percent. Energy storage requirements prevent the use of solar energy systems as base load.

Second, there also are substantial impacts to natural resources (wildlife habitat, land use, and aesthetic impacts) from construction of these facilities. According to the GEIS, land requirements are high—14,000 ha (35,000 acres) per 1000 MW(e) for photovoltaic and approximately 6000 ha (14,000 acres) per 1000 MW(e) for solar thermal systems. Neither type of solar electric system would fit at the HNP site, and either would have large environmental impacts at a greenfield site.

- Third, in addition to the dedicated land-use requirements, the HNP site receives less than 3.9 kWh of solar radiation per square meter per day, compared to 5 to 7.2 kWh of solar radiation per square meter per day in areas of the West, such as California, which are most promising for solar technologies (GEIS, Sections 8.3.2 and 8.3.3). Because of the natural resource impacts (land and ecological), the area's low rate of solar radiation and high technology costs, the staff views the role of solar electric power in Georgia as limited to niche applications and not a feasible base-load alternative to HNP license renewal. Some solar
- I power may substitute for electric power in roof-top and building applications. But any attempt to
 - I implement solar technology on a scale to replace the power output from HNP would result in LARGE environmental impacts.

8.2.4.3 Hydropower

Approximately 15 percent, or 3412 MW(e), of Georgia's generating capacity is hydroelectric (SNC 2000). As GEIS, Section 8.3.4 points out, hydropower's percentage of the country's generating capacity is expected to decline because hydroelectric facilities have become difficult to site as a result of public concern over flooding, destruction of natural habitat, and alteration of natural river courses. Based on the GEIS, land-use estimates for hydroelectric power require approximately 400,000 ha (1 million acres) per 1000 MW(e). Replacement of HNP generating capacity would require flooding more than 7300 km² (2800 mi²) (SNC 2000). Due to the large land-use and related environmental and ecological resource impacts associated with siting a

hydroelectric facility large enough to replace HNP, the staff concludes that local hydropower is not a feasible alternative to HNP license renewal on its own. Any attempts to site hydroelectric facilities large enough to replace HNP would result in LARGE environmental impacts.

8.2.4.4 Geothermal

Geothermal has an average capacity factor of 90 percent and can be used for base-load power where available. However, as illustrated by GEIS, Figure 8.4, geothermal plants might be located in the western continental United States, Alaska, and Hawaii where hydrothermal reservoirs are prevalent. But there is no feasible location for 1690 MW(e) of geothermal capacity to serve as an alternative to HNP license renewal.

The technology is not widely used as base-load generation due to the limited geographical availability of the resource and immature status of the technology (NRC 1996). Although small-scale applications such as geothermal heat pumps may be viable, the technology is not applicable to the region when the replacement of 1690 MW(e) is needed. The staff concludes that geothermal is not a feasible alternative to HNP license renewal.

8.2.4.5 Wood Energy

A wood-burning facility can provide base-load power and operate with an average annual capacity factor of around 70 to 80 percent and with 20 to 25 percent efficiency (GEIS, Section 8.3.6). The fuels required are variable and site-specific. A significant barrier to the use of wood waste to generate electricity is the high delivered fuel cost and high construction cost per equivalent generating capacity with nuclear. The larger wood-waste power plants are only 40 to 50 MW(e) in size. Estimates in the GEIS suggest that the overall level of construction impact should be approximately the same as that for a coal-fired plant, although facilities using wood waste for fuel would be built at smaller scales. Like coal-fired plants, wood-waste plants require large areas for fuel storage and processing and involve the same type of combustion equipment.

In Georgia, the pulp, paper, and paperboard industries, which consume large quantities of electricity, are the largest consumers of wood and wood waste for energy, benefitting from the use of waste materials that could otherwise represent a disposal problem. In 1995, processing of wood products in Georgia generated 13.5 million m³ (478 million ft³) of wood and bark residues. Approximately 48 percent, or 6.5 million m³ (230 million ft³), of the residue was used as industrial fuel (SNC 2000). The 90 trillion Btu of energy estimated to be available annually from Georgia forests would only produce the amount of electricity that HNP produces in 7 hours (SNC 2000).

Alternatives

Due to uncertainties associated with obtaining sufficient wood and wood waste to fuel a base-load generating facility, ecological impacts of large-scale timber cutting (e.g., soil erosion and loss of wildlife habitat), and high inefficiency, the staff has concluded that wood waste is not a feasible alternative to renewing the HNP license.

8.2.4.6 Municipal Solid Waste

The initial capital costs for municipal solid waste plants are greater than for comparable steam-turbine technology at wood-waste facilities. This is due to the need for specialized waste-separation and handling equipment for municipal solid waste. The decision to burn municipal waste to generate energy is usually driven by the need for an alternative to landfills rather than by energy considerations. The use of landfills as a waste disposal option is likely to increase in the near term; however, it is unlikely that many landfills will begin converting waste to energy because of unfavorable economics, particularly with electricity prices declining in "real" terms (DOE 2000). Therefore, municipal solid waste would not be a feasible alternative to HNP license renewal, particularly at the scale required.

8.2.4.7 Other Biomass-Derived Fuels

In addition to wood and municipal solid-waste fuels, there are several other concepts for fueling electric generators, including burning energy crops, converting crops to a liquid fuel such as ethanol (ethanol is primarily used as a gasoline additive for automotive fuel), and gasifying energy crops (including wood waste). The GEIS points out that none of these technologies has progressed to the point of being competitive on a large scale or of being reliable enough to replace a base-load plant such as HNP. For these reasons, such fuels do not offer a feasible alternative to HNP license renewal. In addition, these systems have LARGE impacts on land use.

8.2.4.8 Oil

Oil is not considered a stand-alone fuel because it is not cost-competitive when natural gas is available. The cost of oil-fired operation is as high as eight times as expensive as nuclear and coal-fired operation. More specifically, GPC has six oil-fired units. It has been GPC's experience that the cost of oil-fired operation is about six times that of nuclear operation and two times that of coal-fired operation (SNC 2000). Future increases in oil prices are expected to make oil-fired generation increasingly more expensive than coal-fired generation (DOE 1996). For these reasons, oil-fired generation is not a feasible alternative to HNP license renewal, nor is it likely to be included in a mix with other resources, except as a backup fuel.

8.2.4.9 Advanced Nuclear Power

Work on advanced reactor designs has continued and nuclear plant construction continues overseas. However, the cost of building a new nuclear plant and the political uncertainties that have historically surrounded many nuclear plant construction projects are among the factors that have led energy forecasters (such as the EIA) to predict no new domestic nuclear power plant orders for the duration of current forecasts; i.e., through the year 2020 (DOE 1996). For these reasons, the staff does not consider new nuclear plant construction as a feasible alternative to HNP license renewal.

8.2.4.10 Fuel Cells

Phosphoric acid fuel cells are the most mature fuel cell technology, but they are only in the initial stages of commercialization. Two-hundred turnkey plants have been installed in the United States, Europe, and Japan. Recent estimates suggest that a company would have to produce about 100 MW of fuel-cell stacks annually to achieve a price of \$1000 to \$1500/kW (DOE 1999). However, the current production capacity of all fuel-cell manufacturers only totals about 60 MW/yr. The use of fuel cells for base-load capacity requires very large energy storage devices that are not feasible for storage of sufficient electricity to meet the base-load generating requirements. This is a very expensive source of generation, which prevents it from being competitive. This technology also has a high land-use impact, which, like wind technology, results in a large impact on the natural environment. It is estimated that 14,000 ha (35,000 acres) of land would be required to generate 1000 MW(e) of electricity (NRC 1996). Therefore, the staff considers fuel cells not to be a feasible alternative to license renewal at this time.

8.2.4.11 Delayed Retirement

HNP provides approximately 12 million MWh of GPC's generating capacity and approximately 14 percent of its energy requirements (SNC 2000). As a subsidiary of SNC, GPC supplies electrical power to the SNC regional electric grid (which includes Savannah Electric, Alabama Power, Gulf Power, and Mississippi Power). SNC expects the demand on its regional grid to increase approximately two percent (700 MW/yr), including reserve capacity, through the year 2018. In its planning, SNC considered the delayed retirement of older, less-efficient base-load plants. However, the cost of refurbishing these plants to make them more efficient and meet future emission limits would exceed the cost of building new plants (SNC 2000). For

Alternatives

these reasons, delayed retirement of other SNC generating units would not be a feasible alternative to HNP license renewal.^(a)

8.2.4.12 Utility-Sponsored Conservation

GPC has developed residential, commercial, and industrial programs to reduce both peak demands and daily energy consumption (demand-side management). GPC program components include the following:

- Peak-clipping programs – This includes energy saver switches for air conditioners, heat pumps, and water heaters and allows GPC to interrupt electrical service to reduce load during periods of peak demand. It includes dispersed generation, giving GPC dispatch control over customer backup generation resources; and curtailable service, allowing GPC to reduce customers' load during periods of peak demand.
- Load-shifting programs – These programs use time-of-use rates to encourage shifting loads from on-peak to off-peak periods. Use of computerized real-time displays allow the customer to monitor power usage and to keep power usage below peak thresholds levels while maintaining optimal product production.
- I • Conservation programs – These promote the use of high-efficiency heating, ventilating, and air conditioning systems; encourage the construction of energy-efficient homes and commercial buildings; improve energy efficiency in existing homes; and provide incentives for use of energy-efficient lighting, motors, and compressors.

The GPC demand-side management program currently produces an estimated annual peak demand generation reduction of about 885 MW(e). The GPC load growth projection anticipates a demand-side management savings of about 1120 MW(e) in 2016. Because these savings are part of the long-range plan for meeting projected demand, SNC does not view these savings as available "offsets" for HNP. Nor does SNC foresee the availability of another 1690 MW(e) (HNP capacity) (SNC 2000). Therefore, the conservation option is not considered a reasonable replacement for the license renewal alternative.

(a) An exception to this statement might occur if the new plants were constructed at a greenfield site. Adding the economic costs of new construction to the ecological damages that could occur with development at the virgin site, plus associated permitting costs and delays with plant and site development, the refurbishment of the existing plants might become economically attractive.

8.2.4.13 Combination of Alternatives

Even though individual alternatives to HNP might not be sufficient on their own to replace HNP due to the small size of the resource (hydro) or lack of cost-effective opportunities (e.g., for conservation), it is conceivable that a mix of alternatives might be cost-effective. For example, if some additional cost-effective conservation opportunities, combined with limited wind, small-scale solar, and geothermal, could be found and combined with a smaller imported power or natural gas-fired alternative, it might be possible to reduce some of the key environmental impacts of alternatives. However, it is unlikely that the environmental impact of all aspects of such a hypothetical mix could be reduced to SMALL (see Table 8-6). In comparison, the impacts of renewing the HNP licenses are SMALL on all dimensions.

Table 8-6 provides a summary of the environmental impacts of one assumed combination. The impacts are based on the gas-fired generation impact assumptions discussed in Section 8.2.2 of this report, adjusted for the reduced power generation—1690 MW(e) versus 1200 MW(e)—plus 500 MW(e) obtained through additional conservation measures. While conservation measures would have very little or no negative environmental effects, the gas-fired generation option would increase emissions and environmental impacts. Based on the estimated environmental impacts of the assumed combination, the staff concludes that it is unlikely that the environmental impacts of such a hypothetical mix could be reduced to SMALL.

Alternatives

Table 8-6. Summary of Environmental Impacts of 500-MW(e) Demand-Side Measures, Plus 1200-MW(e) Gas-Fired Generation—Closed-Cycle Cooling

Impact Category	HNP Site		Alternative Greenfield Site	
	Impact	Comments	Impact	Comments
Land Use	MODERATE	Additional 200 ha (500 acres) for power block, 20 to 50 ha (55 to 121 acres) disturbed for gas pipeline; land disturbed currently forested and would be in addition to land already disturbed onsite; additional land for backup oil storage tanks	MODERATE	360 ha (900 acres) for power block, offices and transmission lines; additional land for backup oil storage tanks
Ecology	MODERATE to LARGE	Constructed on cleared land adjacent to HNP site; habitat loss due to pipeline construction	MODERATE to LARGE	Impact depends on location and ecology of the site
Water Use and Quality				
- Surface Water	SMALL	>75% reduction in water flow compared to existing HNP use	SMALL to MODERATE	Impact depends on volume and characteristics of receiving body of water
- Groundwater	SMALL	Reduced groundwater withdrawals due to reduced workforce	SMALL to MODERATE	Groundwater impacts would depend on uses and available supply
Air Quality	SMALL to MODERATE	Primarily NO _x for gas-fired plant	SMALL to MODERATE	Same impacts as for HNP site
Waste	SMALL	Minor waste generation with gas (oil not evaluated)	SMALL	Same impacts as for HNP site
Human Health	SMALL	Impacts considered to be minor (see discussion of gas-fired alternative)	SMALL	Same impacts as for HNP site

Table 8-6. (contd)

Impact Category	HNP Site		Alternative Greenfield Site	
	Impact	Comments	Impact	Comments
Socioeconomics	MODERATE	500 to 750 additional workers during 3-year construction period; followed by a reduction in employment from 950 persons at HNP to 125 persons; tax base sustained with new gas-fired plant replacing HNP	MODERATE to LARGE	Construction impacts would be relocated. Appling and Toombs counties would experience workforce reduction plus loss of tax base if plant were located elsewhere. Other community gains 125 workers
	SMALL	Transportation impacts would be SMALL due to less commuting workforce than HNP or coal-fired alternatives	SMALL	Transportation impacts would most likely be SMALL; actual impacts depend on population, transportation systems
Aesthetics	SMALL to MODERATE	Visual impact of stacks would be noticeable, but not as significant as coal-fired option or existing HNP reactor building and stack	SMALL to MODERATE	Alternate locations could reduce aesthetic impact if siting is in an industrial area
Archaeological and Historic Resources	SMALL	Plant footprint less than coal-fired alternative; HNP site knowledge minimizes possible cultural resource impacts	SMALL	Alternate location would necessitate cultural resource preservation measures
Environmental Justice	SMALL to MODERATE	Impacts on minority and low-income populations should be similar to those experienced by the population as a whole. Impacts on housing are possible during construction; loss of 825 high-paying jobs might lessen employment opportunities for minority and low-income populations.	SMALL to LARGE	Impacts vary depending on population distribution and makeup; impacts to Appling County could be MODERATE to LARGE if new plant built outside county

8.3 References

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U.S. Nuclear Regulatory Commission (NRC). 1988. *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities.* NUREG-0586, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants*, NUREG-1437, Volume 1, Addendum 1. Washington, D.C.

9.0 Summary and Conclusions

By letter dated February 29, 2000, Southern Nuclear Operating Company (SNC) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, operating licenses (OLs) for an additional 20-year period (SNC 2000). If the OLs are renewed, Federal (other than NRC) decisionmakers, State regulatory agencies, and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, the units will be shut down at or before the expiration of the current OLs, which are August 6, 2014, for Unit 1, and June 13, 2018, for Unit 2.

Under the National Environmental Policy Act (NEPA) (42 USC 4321-4370d), an environmental impact statement (EIS) is required for major Federal actions significantly affecting the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a)

Upon acceptance of the SNC application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping (65 FR 19797). The staff visited the HNP site on May 10 and 11, 2000, and held public scoping meetings on May 10, 2000, in Vidalia, Georgia (NRC 2000a). The staff reviewed the SNC Environmental Report (ER; SNC 2000), compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000b).

On November 9, 2000, the staff issued the draft of the supplemental environmental impact statement (SEIS) for public comment; it contained the preliminary results of the staff's evaluation and recommendation. In addition, the staff held two public meetings during the comment period for this report on December 12, 2000. After the comment period ended on January 24, 2001, the staff considered and dispositioned all of the comments received, as discussed in Appendix A of this report. Modifications were made to this report to address certain comments, where appropriate, as described in Appendix A.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. All references to the "GEIS" include the GEIS and its Addendum 1.

Summary and Conclusions

- I This SEIS presents the staff's analysis of the environmental impacts of renewal of the HNP OLs. The analysis considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for
- I reducing or avoiding adverse impacts. It also includes the staff's final recommendation regarding the proposed action.

The Commission has adopted the following statement of purpose and need for license renewal from the GEIS:

The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OLs.

NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of SEISs prepared at the license renewal stage:

The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the

generic determination in § 51.23(a) ["Temporary storage of spent fuel after cessation of reactor operations—generic determination of no significant environmental impact"] and in accordance with § 51.23(b).^(a)

The GEIS contains the results of a systematic evaluation of the consequences of renewing an OL and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the following three-level standard of significance—SMALL, MODERATE, or LARGE—based on Council on Environmental Quality guidelines.

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.

For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of significant new information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations—generic determination of no significant environmental impact."

Summary and Conclusions

Of the 23 issues not meeting the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must also be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

- I This SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the HNP OLS) and alternative methods of power generation. Among the alternative methods of power generation, coal-fired and gas-fired generation appear to be the most likely if the power from HNP is replaced. These alternatives are evaluated assuming that the replacement power generation plant is located at either the HNP site or an unspecified "greenfield" site.

9.1 Environmental Impacts of the Proposed Action— License Renewal

SNC and the staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither SNC nor the staff has identified any significant new information related to Category 1 issues that would call into question the conclusions in the GEIS. Therefore, the staff relies upon the conclusions of the GEIS for all 69 Category 1 issues.

Similarly, neither SNC nor the staff has identified any new issue applicable to HNP that has a significant environmental impact.

- SNC's license renewal application presents analyses of the Category 2 issues. The staff has reviewed the SNC analysis for each issue and has conducted an independent review of each issue. Five Category 2 issues are not applicable because they are related to plant design features or site characteristics not found at HNP. Four Category 2 issues are not discussed in this SEIS because they are specifically related to refurbishment. SNC (SNC 2000) has stated that their evaluation of structures and components as required by 10 CFR 54.21 did not identify any major plant refurbishment activities or modifications as being necessary to support the continued operation of HNP beyond the end of the existing OLS. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant
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component replacement and therefore are not expected to affect the environment outside of the bounds of the plant operations evaluated in the final environmental statements (AEC 1972; NRC 1978) for HNP.

Twelve Category 2 issues, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this SEIS. Five of the Category 2 issues and environmental justice apply to both refurbishment and to operation during the renewal term and are only discussed in this SEIS in relation to operation during the renewal term. For all 12 Category 2 issues and environmental justice, the staff concludes that the potential environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff concluded that a consensus has not been reached by appropriate Federal health agencies that there are adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), it is the staff's conclusion that a reasonable, comprehensive effort was made to identify and evaluate SAMAs and that none of the candidate SAMAs are cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted.

The following subsections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction have been avoided, have been mitigated, or have occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

Because there is no refurbishment planned for HNP, there are no refurbishment-related environmental impacts. The adverse impacts of continued operation identified are considered to be of SMALL significance, and none warrants implementation of additional mitigation measures. The adverse impacts of likely alternatives in the event that HNP ceases operation at or before the expiration of the current OLS will not be smaller than those associated with continued operation of HNP, and they may be greater for some impact categories in some locations.

Summary and Conclusions

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of HNP during its current license period was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance and operation, the nuclear fuel used by the reactors, and, ultimately, permanent offsite storage space for the spent fuel assemblies.

The most significant resource commitments related to operation during the renewal term are the fuel and the permanent storage space. HNP replaces approximately 250 fuel assemblies annually. Assuming no change in use rate, about 5000 spent fuel assemblies would be required for operation during a 20-year license renewal period.

The likely power generation alternatives in the event HNP ceases operation on or before the expiration of the current OLs will require a commitment of resources for construction of the replacement plants as well as for fuel to run the plants.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between short-term use and long-term productivity of the environment at the HNP site was set when the plants were approved and construction began. That balance is now well established. Renewal of the HNP OLs and continued operation of the plants will not alter the existing balance, but it may postpone the availability of the site for other uses. Denial of the application to renew the OLs will lead to shutdown of the plants and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the HNP site into a park or an industrial facility are quite different.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the OLs for HNP, Units 1 and 2. Chapter 2 describes HNP and the environment in the vicinity of the plant. As noted in Chapter 3, no refurbishment and no refurbishment impacts are expected at HNP. Chapters 4 through 7 discuss environmental issues associated with renewal of the OLs. Environmental issues associated with the no-action alternative and alternatives involving power generation are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the OLS), the no-action alternative (denial of the application), alternatives involving coal and gas-fired generation of power at the HNP site and an unspecified "greenfield site," and a combination of alternatives are compared in Table 9-1. Continued use of the HNP cooling-tower-based heat-dissipation cooling system is assumed for Table 9-1. Substitution of a once-through cooling system for the closed-cycle cooling system in the evaluation of the coal-fired and gas-fired generation alternatives would result in somewhat greater environmental impacts in some impact categories. |

Table 9-1 shows that the significance of the environmental effects of the proposed action are SMALL for all impact categories (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, for which a single significance level was not assigned). The alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

9.3 Staff Conclusions and Recommendations

The staff recommends that the Commission determine that the adverse environmental impacts of license renewal for HNP, Units 1 and 2, are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants* (GEIS), NUREG-1437, (NRC 1996; 1999); (2) the ER submitted by SNC (SNC 2000); (3) consultation with other Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments. |

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation (Including a Combination of Alternatives) Assuming a Closed-Cycle Cooling System

Impact Category	Proposed Action	No-Action Alternative	Coal-Fired Generation		Gas-Fired Generation		Combination	
	License Renewal	Denial of Renewal	HNP Site	Greenfield Site	HNP Site	Greenfield Site	HNP Site	Greenfield Site
Land Use	SMALL	SMALL	MODERATE	MODERATE to LARGE	MODERATE	MODERATE	MODERATE	MODERATE
Ecology	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Water Quality — Surface Water	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Water Quality — Groundwater	SMALL	SMALL	SMALL	SMALL to LARGE	SMALL	SMALL to LARGE	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	MODERATE	MODERATE	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL	MODERATE	MODERATE	SMALL	SMALL	SMALL	SMALL
Human Health	SMALL ^(a)	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE	MODERATE to LARGE	MODERATE	MODERATE to LARGE
Transportation	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL	SMALL
Aesthetics	SMALL	SMALL	SMALL To MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Historic and Archaeological Resources	SMALL	SMALL to LARGE	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Environmental Justice	SMALL	MODERATE to LARGE	MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE
(a) Except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent-fuel disposal, for which a significance level was not assigned. See Chapter 6 for details.								

9.4 References

10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51.20, "Criteria for and identification of licensing and regulatory actions requiring environmental impact statements."

10 CFR 51.23, "Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

10 CFR 54.21, "Contents of application—technical information."

65 FR 19797, "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process." April 12, 2000.

National Environmental Policy Act (NEPA) of 1969, as amended, 42 USC 4321, et seq.

Southern Nuclear Operating Company (SNC). 2000. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage, Edwin I. Hatch Nuclear Plant.*

U.S. Atomic Energy Commission (AEC). 1972. *Final Environmental Statement for the Edwin I. Hatch Nuclear Plant Units 1 and 2.* Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1978. *Final Environmental Statement related to Operation of Edwin I. Hatch Nuclear Plant Unit No. 2. Georgia Power Company.* Docket No. 50-366, NUREG-0417, Office of Nuclear Reactor Regulation, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS).* NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1,*

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Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants.
NUREG-1437, Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000a. *Environmental Impact Statement Scoping Process: Summary Report - Hatch Nuclear Station, Units 1 and 2, Appling County, Georgia.* Washington, D. C. August 23, 2000

U.S. Nuclear Regulatory Commission (NRC). 2000b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal,* NUREG-1555, Supplement 1. Washington, D.C.

Appendix A

Discussion of Comments Received on the Environmental Review

Appendix A

Discussion of Comments Received on the Environmental Review

This entire section was added to the report after the draft supplemental environmental impact statement (SEIS) was issued for public comment. As a result, no sidebar lines are used in this appendix.

Part I - Comments Received During Scoping

On April 12, 2000, the Nuclear Regulatory Commission (NRC) initiated the scoping process for Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, with the issuance of a Federal Register Notice of Intent (65 FR 19797) to prepare a plant-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999) to support the renewal application for the HNP operating licenses. The NRC invited the applicant; Federal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at the scheduled public meetings and/or submitting written suggestions and comments no later than June 9, 2000. The scoping process included two public scoping meetings that were held at the Southeastern Technical Institute in Vidalia, Georgia, on May 10, 2000. Both sessions began with NRC staff members providing a brief overview of the license renewal process and the National Environmental Policy Act (NEPA) process. Following the NRC's prepared statements, the meetings were opened for public comments. A total of 23 attendees provided oral comments or written statements and both the afternoon and evening sessions were transcribed by a certified court reporter. The corrected meeting transcripts are available as an attachment to the June 8, 2000, meeting summary. In addition to the comments provided during the public meetings, nine comment letters and three e-mail messages were received by the NRC in response to the Notice of Intent during the scoping period.

At the conclusion of the scoping period, the NRC staff and its contractor reviewed the transcripts and all written material received, and identified individual comments. All comments and suggestions received orally during the scoping meetings or in writing were considered while developing the SEIS (NUREG-1437, Supplement 4). Each commenter was given a unique identifier (commenter number) so that their comments could be traced back to the transcripts or written comments. Comments with similar specific objectives were combined to capture the common essential issues that had been raised in the source comments. Once comments were grouped according to subject area, the staff and contractor determined the appropriate action for the comment. The staff made a determination on each comment that it was one of the following:

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- (1) a comment that was actually a request for information and introduced no new information
- (2) a comment that was either related to support or opposition of license renewal in general (or specifically HNP) or that made a general statement about the license renewal process. It may have made only a general statement regarding Category 1 and/or Category 2 issues. In addition, it provided no new information and does not pertain to 10 CFR Part 54.
- (3) a comment about a Category 1 issue that
 - (a) provided new information that required evaluation during the review, or
 - (b) provided no new information
- (4) a comment about a Category 2 issue that
 - (a) provided information that required evaluation during the review, or
 - (b) provided no such information
- (5) a comment that raised an environmental issue that was not addressed in the GEIS
- (6) a comment on safety issues pertaining to 10 CFR Part 54, or
- (7) a comment outside the scope of license renewal (not related to 10 CFR Parts 51 or 54).

A summary report of the comments from the scoping meetings and written comments was prepared and published on August 23, 2000.

While developing this plant-specific supplement to the GEIS, the staff and its contractor considered all of the relevant issues raised during the scoping process. Table A-1 identifies the individuals who provided comments that were applicable to the environmental review. The individuals are listed in the order in which they spoke at the meetings or provided written comments. To maintain consistency with the scoping summary, the same unique identifier that was used for that person in the report was retained. The accession number is provided for the written comments to facilitate access to the document through the Public Electronic Reading Room (Agency-wide Document Access Management System [ADAMS]). Comments were then consolidated and categorized according to the topic within the proposed supplement to the GEIS, or according to the general topic if outside the scope of the GEIS.

Each comment that was applicable to the environmental review is summarized in this section. This information was extracted from the HNP Scoping Summary Report, dated August 23, 2000, and is being provided in this report for the convenience of those interested in the scoping comments applicable to this environmental review. The comments that were determined to be general or outside the scope of the environmental review for HNP are not included in this report. More detail regarding the disposition of general or nonapplicable comments can be

found in the HNP Scoping Summary Report. Commenters whose comments are not discussed in this section will find the disposition of their concerns addressed in that report.

Table A-1. Individuals Providing Comments During Scoping Comment Period

Commenter Number	Commenter's Name	Commenter's Affiliation (If Stated)
Afternoon Session of Public Meeting (Accession #ML003722540)		
1	Janisse Ray	Resident, Baxley
2	Deborah Sheppard	Exec. Director, Altamaha Riverkeeper organization
3	Rita Kilpatrick spoke at both sessions	Executive Director, Campaign for a Prosperous Georgia
4	Lewis Sumner – spoke at both sessions	Southern Nuclear Operating Company (SNC), Vice President of Hatch Project
5	Byron Fiemster – spoke at both sessions	SNC, Hatch Environmental Specialist
6	Cathy Mehan	President, Southern Technical Institute, Vidalia
7	Dane Bruce (statement read)	Director, Appling County Emergency Management Agency
8	Pamela Blockey-O'Brien – spoke at both sessions and provided a written statement	On behalf of National and International Fellowship of Reconciliation (FOR/IFOR)
9	Duane Whitley	Chairman, Appling County Commission
10	Roger Byrd	State House Industry Committee
11	Lewis Parker	Sheriff, Appling County
12	Tim Smith	Superintendent, Vidalia City Schools
14	Eddie Tyson	Resident, Vidalia
15	Steve Rigdon	Mayor of Baxley
16	Ralph Beedle – spoke at both afternoon and evening sessions	Sr. Vice President and Chief Nuclear Officer, Nuclear Energy Institute, Washington, D.C.
17	Karen Durden	President, Toombs-Montgomery-Wheeler County United Way

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Commenter Number	Commenter's Name	Commenter's Affiliation (If Stated)
Evening Session of Public Scoping Meeting (Accession #ML003722540)		
20	Dale Adkins	Director, Appling County Development
21	Mike Cleland	County Manager, Appling County
23	Ross Kitts	Municipal Electric Authority of Georgia
Letters and E-Mail Messages Received During Comment Period		
24	Jeffrey P. Baxley (dated April 28, 2000) Accession #ML003711952	City Manager, Baxley
25	Cathryn T. Meehan (dated May 1, 2000) Accession #ML003713015	President, Southeastern Technical Institute
26	J. Edward Tyson (dated May 8, 2000) Accession #ML003717837	President, Darby Bank & Trust Company
27	Bill Mitchell (dated May 26, 2000) Accession #ML003734958	President, Toombs-Montgomery Chamber of Commerce
28	Pamela Blockey-O'Brien (dated May 29, 2000) Accession #ML003721382	FOR/IFOR (see #8 above)
29	Tommie Williams (dated May 30, 2000) Accession #ML003721062	Georgia State Senator, District 6
31	Dusty Gres (dated June 5, 2000) Accession #ML003722922	Resident, Appling County
32	Pamela Blockey-O'Brien (dated June 7, 2000) Accession #ML003725750	See 8, 28, and 30, above
33	Greg Morris (dated June 8, 2000) Accession #ML003724837	Georgia State House of Representatives
34	Deborah Sheppard (dated June 9, 2000) Accession #ML003725755	Executive Director, Altamaha Riverkeeper organization
35	Rita Kilpatrick (dated June 9, 2000) Accession #ML003725758 and ML003734958	Executive Director, Campaign for a Prosperous Georgia

For reference, after the comment, the unique identifier (commenter number listed in Table A-1) of the commenter is provided in parentheses. In those cases where no new information was provided by the commenter, no further evaluation was performed.

Comments Concerning Ecology

Comment: I am proud of our work at Plant Hatch, including wide applications of land management, to preserve and protect the environment. (4)

Comment: The review of monitoring data around the generating facilities shows that Plant Hatch is a good steward of this vital resource and has no significant impact on the Altamaha [River]. (5)

Comment: A detailed field survey to identify any threatened or endangered species and potential habitats was developed listing State- and Federal-listed species known to occur on the site and transmission line corridors bordering the Altamaha River. Extended operation will add no adverse impacts to threatened or endangered species at or near Plant Hatch. (5)

Comment: Plant Hatch's 26 years of operation has not adversely affected the air quality. Its use prevents 11 million metric tons a year of carbon dioxide [potentially released by other types of large-scale power generation]. (5)

Response: *The comments are noted. They summarize the applicant's review of ecological issues, as documented in their license renewal application. The comments provide no new information and therefore will not be evaluated further.*

Comment: Plant Hatch personnel are doing the very best to ensure that the Altamaha River is the kind of place where we can [safely] take our children and grandchildren. (10)

Comment: Plant Hatch and the government are monitoring [for releases of radioactive materials]. (11)

Comment: The Altamaha River looks much better than it did 30 years ago, and the fishing is as good or better. (21)

Comment: When you compare Plant Hatch with any other thermal generating facility and compare emissions such as oxidized carbon, nitrogen, and sulfur, it is what it does not emit that is important. Plant Hatch is really an environmentally friendly operation. (23)

Comment: Their policies in relation to the care of the natural environment have been pleasingly impressive. (31)

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Response: *The comments are noted. They provide no new information and do not pertain to 10 CFR Part 54. Therefore, they will not be evaluated further.*

For additional information concerning ecology and threatened or endangered species, see Sections 2.2.5, 2.2.6, and 4.6.

Comments Concerning Human Health Effects

Comment: The Plant Hatch employees would not continue their employment if they felt it was a threat to their health or their family's health. (15)

Response: *The comment is noted. It provides no new information and does not pertain to 10 CFR Part 54. Therefore, it will not be evaluated further.*

Comment: Will the study include the radiological impacts to the public from river contamination? (1)

Comment: Epidemiological studies should be done for areas surrounding the Hatch plant. (1)

Comment: Are you aware of independent evaluations to assess current offsite radiological effects of Plant Hatch? And do you know how far Plant Hatch monitoring ranges geographically? Is there a systematic analysis of downstream effects beyond the 10-mile radius of the plant? (2)

Comment: Radiological studies should be conducted more extensively through the watershed. (2)

Comment: Radiological studies of the Altamaha River system should be conducted by independent investigators with no industry or government ties. (32)

Comment: It takes time for health problems to really reveal themselves and it is with ensuing generations where problems are likely to arise. (3)

Comment: Radiation from spent fuel storage casks will add to the already existing contamination levels above the routine releases to water and air. (3)

Comment: Human health is threatened from exposure to radioactivity from the plant and its nuclear waste. (8)

Comment: Referring to information from other sources, ionizing radiation has shown evidence of being a mutagen of unique potency. Some people believe that there is no safe dose of radiation. (8)

Comment: The plant's proximity to the river and its potential for continued routine release of radiation and other man-made pollutants into the river and its drainage area create anxiety and concern. (32, 34)

Response: *The NRC requires the utility to routinely conduct radiological monitoring of all plant effluents and of surface and groundwater, food supplies, and dairy cattle within a 10-mile radius of the plant. The NRC also communicates with permitting agencies who administer the Clean Water Act and the Clean Air Act, State radiological agencies, Fish and Wildlife Services, and other organizations. The radioactive emissions are consistently very low. [Note that radiation emissions from the shipping [storage] casks do not significantly contribute radioactivity to the environment.] Radiation exposure to the public and workers was evaluated in the GEIS and determined to be a Category 1 issue. No new information was provided by the comments. Therefore, they will not be evaluated further.*

For additional information concerning radiological waste management and effluent control systems, see Section 2.1.4. For additional information concerning radiological impacts to the public and the environment, see Sections 2.2.7 and 4.3.

Comments Concerning Socioeconomics

Comment: Plant Hatch employees are taking the lead in making their communities better places to live, giving generously of their time and resources. (4)

Comment: Plant Hatch is an important part of the local economy with a large payroll and contribution to local and State taxes. (4)

Comment: The surrounding communities have greatly benefitted economically and in quality of life from the resources associated with Plant Hatch. (6)

Comment: Plant Hatch has been an integral part of the economy of Appling County and the surrounding area since its construction, providing jobs and supporting economic growth in this region. (7)

Comment: Georgia Power (SNC) [Southern Nuclear Operating Company] is very cooperative within the community, paying taxes and providing high-tech jobs. (9)

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Comment: The loss of the Hatch plant would adversely impact the economy, a societal environmental impact and an educational impact. (11)

Comment: I can attest to the extensive role that Plant Hatch has played in the economic growth of Toombs and surrounding counties. Plant Hatch employees are dedicated to making our community a better place to live. (14, 26)

Comment: If there is so much to be afraid of from Plant Hatch, why have well-educated, retired employees chosen to live here? (14)

Comment: The loss of Plant Hatch would be devastating to Baxley and Appling Counties and all of South Georgia if it is not relicensed. (15)

Comment: I believe it is a good, safe, viable industry that continues to be a good neighbor. (15)

Comment: We are fortunate to have the United Way volunteer and financial assistance of Plant Hatch employees. (17)

Comment: The quality of leadership by plant employees has given direction to the local communities in civil and political arenas. (20)

Comment: The existence of the local trained labor force helps in recruiting industry to the area. (20)

Comment: Plant Hatch has made a tremendous impact on the local job structure, providing jobs for our people. (21)

Comment: Contributions to tax rolls reduces tax burden of individual property owners, and allows Appling county to maintain one of the lowest millage rates in the State. (21)

Comment: Plant Hatch surely contributes more to Appling county than any other local industry or business. (21)

Comment: Plant Hatch has been a good neighbor, touching area citizens through [contributions to] recreation, civic, hospital, safety, and in many other ways. (21)

Comment: If Plant Hatch were ever to close, it would have a devastating impact on Appling County. (21)

Comment: As one of the largest employers in Appling County, Plant Hatch has been a vital part of the economy, providing excellent jobs and economic growth to the City of Baxley and Appling County. Over 60% of the *ad valorem* taxes paid in Appling County come from Plant Hatch. Refueling outages positively impact sales tax revenues. (24)

Comment: Plant Hatch is a good neighbor, and its employees are very community minded, active in local civic organizations. (24)

Comment: Plant Hatch has served the community well and their management team and staff continue to be very active in local charities and many organizations. Plant Hatch is the largest contributor to the local United Way agency. (25)

Comment: The economic impacts of the Hatch plant make up for 1000 jobs recently lost in the region. (27)

Comment: Southern Nuclear and Georgia Power are excellent "Good Neighbors." (27)

Comment: Plant Hatch has been an integral part of the economy and is an important component of economic growth. (29)

Comment: Plant Hatch has been a good neighbor, an integral part of the Toombs County economy, and is an important component in recent economic growth. Plant staff keep the State informed of plant status and activities. Extending the license would be favorably viewed by the State Representative's Office and the Vidalia community. (33)

Response: *The comments are noted. The comments provided no new information and, therefore, will not be evaluated further.*

Comment: The plant is located in South Georgia because we are poor, isolated, and we are a forgotten place. (1)

Comment: Economic justice is not being served in maintaining Hatch plant in an economically depressed area. (8, 28)

Comment: Southern Nuclear underestimates economic and social costs of a radiological accident. (8, 28)

Response: *The comments are noted. Socioeconomic impacts and environmental justice of license renewal are part of the staff's evaluation for the SEIS.*

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For additional information concerning socioeconomic issues, see Sections 2.2.8 and 4.4. For additional information concerning environmental justice, see Section 4.4.6. For additional information concerning the environmental impacts of postulated accidents, see Chapter 5.

Comments Concerning Historic and Archaeological Resources

Comment: There are no historical or archaeological sites identified on the plant site, and license renewal will not require additional land usage. (5)

Response: *The comment is noted. Evaluation of historical and archaeological resources is part of the staff's evaluation for the SEIS.*

For additional information concerning historic and archaeological resources, see Sections 2.2.9 and 4.4.5.

Comments Concerning Accidents and Evaluations

Comment: The possibility and consequences of a future accident have been underestimated given the design of the reactor and that Unit 1's cracked core shroud could fail due to embrittlement and vibration. (8)

Response: *Severe accidents were evaluated in the GEIS and were determined to be a Category 1 issue [with the exception of severe accident mitigation alternatives (SAMAs)]. A site-specific, SAMA analysis for Hatch will be performed by NRC staff within this environmental analysis.*

For additional information concerning the SAMA analysis for HNP, see Chapter 5.0.

Comments Concerning Nuclear Waste Storage and Disposal

Comment: There are dangers of having spent nuclear fuel stored on site, and the idea that using spent fuel casks is not a part of relicensing is obscene. An explosion of such a cask would have horrendous consequences. (8, 28)

Comment: Temporary storage of nuclear waste is probably not temporary because burying it at Yucca Mountain or on the Goshute Indian Reservation is [unlikely and unacceptable]. (8)

Comment: The Altamaha Riverkeeper's Board of Directors are concerned about the impact of onsite dry cask storage of spent nuclear fuel. (34)

Comment: Generation of more waste including the proposed 5000 additional assemblies will exacerbate growing liability to local governments. (35)

Response: *The siting and construction of a national waste repository are the responsibility of the Department of Energy. The Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century (10 CFR Part 51.23). In the interim, onsite spent fuel storage in pools and in dry cask storage facilities continues in accordance with NRC regulations. The Commission has determined that onsite spent fuel can be stored safely for 30 years after the current operating license or a renewed license expires. No new information was provided by the comments. Therefore, they will not be evaluated further.*

The evaluation of the environmental and economic impacts of spent fuel storage beyond the term of the renewed license is outside the scope of this analysis and is not addressed in this SEIS (except in response to comments in Section A.1.17 of this Appendix). For additional information concerning spent fuel storage during the renewal term, see Section 6.1

Comments Concerning Alternative Energy Sources

Comment: The alternatives, including photovoltaic and wind energy, to providing high power output and doing it with clean air sources are relatively limited today. Until we develop something better, nuclear power is going to continue providing a source of clean energy in a growing economy. (16)

Response: *The comment is noted and provides no new information. Therefore, it will not be evaluated further.*

Comment: The applicant has not properly assessed wind power, solar, geothermal, and wood energy/biomass options to replace nuclear [power]. (35)

Comment: It is important to look at the new technologies that are available not only from a distributive generation vantage point but also from the broader technology choices that are becoming available worldwide. (3)

Response: *The GEIS included an extensive discussion of alternatives. The plant-specific supplement to the GEIS will include an analysis of reasonable alternative energy sources and the option of shutting the plant down and decommissioning the facility.*

For additional information concerning alternatives to renewing the HNP licenses, see Chapter 8.

Appendix A

Summary

While developing this plant-specific supplement to the GEIS, the staff and its contractor considered all of the relevant issues raised during the scoping process that are identified in this section. Concerns identified that are outside the scope of the staff's environmental review have been forwarded to the appropriate NRC program manager for disposition. More detail about the results of the staff's scoping review for HNP, including the disposition of general or nonapplicable comments, can be found in the HNP Scoping Summary Report, dated August 23, 2000.

Part II - Comments Received on the Draft Supplement

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Edwin I. Hatch Nuclear Plant, Draft Report for Comment* (NUREG-1437, Supplement 4, referred to as the draft SEIS) to Federal, State, and local government agencies as well as interested members of the public. As part of the process to solicit public comments on the draft SEIS, the staff

- placed a copy of the draft SEIS into the NRC's electronic Public Document Room, its license renewal website, and the Appling County Public Library located at 242 East Parker Street, Baxley, Georgia 31513
- sent copies of the draft SEIS to the applicant, members of the public who requested copies, and certain Federal, State, and local agencies
- published a notice of availability of the draft SEIS in the Federal Register on November 9, 2000 (65 FR 67418)
- issued public announcements, such as advertisements in local newspapers and postings in public places, of the availability of the draft SEIS
- issued public service announcements and press releases announcing the issuance of the draft SEIS, the public meetings, and instructions on how to comment on the draft SEIS
- established a website to receive comments on the draft SEIS through the Internet, and
- announced and held two public meetings in Vidalia, Georgia, on December 12, 2000, to describe the results of the environmental review and answer related questions.

During the comment period, the staff received a total of 10 comment letters in addition to the comments received during the public meetings.

The staff has reviewed the public meeting transcripts and the 10 comment letters that are part of the docket file for the application, all of which are available in the NRC's electronic Public Document Room. Section A.1 contains a summary of the comments and the staff's responses. Related issues are grouped together. Section A.2 contains excerpts of the December 12, 2000, public meeting transcripts, the written statements provided at the public meetings, and comment letters.

Each comment identified by the staff was assigned a specific alpha-numeric identifier (marker). That identifier is typed in the margin of the transcript or letter at the beginning of the discussion of the comment. In addition, to assist the reader in finding the response to the comment, the section number(s) where the comment is addressed in Section A.1 of this report is also listed in the margin next to the identifier. A cross-reference of the alpha-numeric identifiers, the speaker or author of the comment, the page where the comment can be found, and the section(s) of this report in which the comment is addressed is provided in Table A-2. The speakers at the meetings are listed in speaking order along with the page of the transcript excerpts in this report on which the comment appears. These comments are identified by the letter "A" followed by a number that identifies each comment in approximate chronological order in which the comments were made. The written statements (from the public meetings) are identified by the letters "B" and "F." The written comment letters are identified with the letters "C" through "M" (except for "F"). Additionally, letters "N" through "V" refer to comments made during the scoping period that were specifically referred to in the comment letters received during the comment period following the release of the draft SEIS.

The staff made a determination on each comment that it was one of the following:

- (1) a comment that was actually a request for information and introduced no new information
- (2) a comment that was either related to support or opposition of license renewal in general (or specifically HNP) or that made a general statement about the license renewal process. It may have made only a general statement regarding Category 1 and/or Category 2 issues. In addition, it provided no new information and does not pertain to 10 CFR Part 54.
- (3) a comment about a Category 1 issue that
 - (a) provided new information that required evaluation during the review, or
 - (b) provided no new information
- (4) a comment about a Category 2 issue that
 - (a) provided information that required evaluation during the review, or
 - (b) provided no such information

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- (5) a comment that raised an environmental issue that was not addressed in the GEIS or the draft SEIS
- (6) a comment on safety issues pertaining to 10 CFR Part 54, or
- (7) a comment outside the scope of license renewal (not related to 10 CFR Parts 51 or 54).

There was no significant new information provided on Category 1 issues [(3)(a) above]. If the comment provided new information for a Category 2 issue [(4)(a)], the staff evaluated the information and modified the SEIS, as appropriate. If the comment provided no new information for Category 1 or 2 issues [3(b) or 4(b)], the conclusions of the GEIS and the draft SEIS remained valid and bounding, and no further evaluation was performed.

Comments without a supporting technical basis or that did not provide any new information are discussed in this appendix, and not in other sections of this report. Relevant references that address the issues within the regulatory authority of the NRC are provided where appropriate. Many of these references can be obtained from the NRC electronic Public Document Room.

Within each section of this appendix (A.1.1 through A.1.26), similar comments are grouped together for ease of reference, and a summary description of the comments is given, followed by the staff's response. Where the comment or question resulted in a change in the text of the draft report, the corresponding response refers the reader to the appropriate section of this report where the change was made. Revisions to the text in the draft report are designated by vertical lines beside the text.

Some numbers were initially assigned to portions of verbal or written statements that were later determined not to be comments. These items were removed from the table. As a result, not all numbers are sequential (see Table A-2).

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
A01	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-82	A.1.3
A02	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-82	A.1.23
A04	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-83	A.1.4
A05	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-83	A.1.26
A06	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-84	A.1.26
A07	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-86	A.1.5
A09	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-86	A.1.26
A10	J. Holland	Afternoon Meeting Transcript (12/12/00)	A-87	A.1.11
A11	D. Shaw	Afternoon Meeting Transcript (12/12/00)	A-87	A.1.11
A12	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-87/88	A.1.7
A13	J. Holland	Afternoon Meeting Transcript (12/12/00)	A-88	A.1.7
A14	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-88	A.1.7
A15	D. Shaw	Afternoon Meeting Transcript (12/12/00)	A-89	A.1.11
A17	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-89	A.1.17
A18	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-90/91	A.1.17
A19	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-90/91	A.1.17
A20	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-91	A.1.17
A21	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-92	A.1.19
A22	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-92	A.1.19
A23	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-92	A.1.19
A24	J. Holland	Afternoon Meeting Transcript (12/12/00)	A-93	A.1.16
A25	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-94	A.1.24
A26	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-94	A.1.24
A27	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-94/95/96	A.1.4
A28	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-97	A.1.4

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Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
A29	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-97	A.1.1
A30	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-98	A.1.1
A31	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-98	A.1.1
A32	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-98	A.1.1
A34	S. Rigdon	Afternoon Meeting Transcript (12/12/00)	A-99	A.1.1
A35	J. Baxley	Afternoon Meeting Transcript (12/12/00)	A-99	A.1.1
A36	J. Baxley	Afternoon Meeting Transcript (12/12/00)	A-100	A.1.4
A37	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-100	A.1.14
A40	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.2
A41	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.4
A42	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.26
A43	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.4
A44	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.4
A45	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.4
A46	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-102	A.1.21
A47	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-102	A.1.21
A48	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-102	A.1.7
A49	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-103	A.1.13
A50	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-103	A.1.13
A51	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-103	A.1.13
A52	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-103	A.1.13
A53	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.13
A54	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.13
A55	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.2
A56	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.4

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
A57	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.4
A58	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-104	A.1.4
A59	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.4
A60	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.26
A61	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.7
A62	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.19
A63	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.1
A64	D. Gres	Afternoon Meeting Transcript (12/12/00)	A-105	A.1.24
A65	J. Ray	Evening Meeting Transcript (12/12/00)	A-106	A.1.5
A66	J. Ray	Evening Meeting Transcript (12/12/00)	A-106	A.1.5
A68	J. Ray	Evening Meeting Transcript (12/12/00)	A-106	A.1.3
A69	J. Ray	Evening Meeting Transcript (12/12/00)	A-107	A.1.13
A70	J. Ray	Evening Meeting Transcript (12/12/00)	A-107	A.1.13
A71	J. Ray	Evening Meeting Transcript (12/12/00)	A-107	A.1.13
A72	J. Person	Evening Meeting Transcript (12/12/00)	A-108	A.1.3
A73	J. Ray	Evening Meeting Transcript (12/12/00)	A-109	A.1.11
A75	J. Ray	Evening Meeting Transcript (12/12/00)	A-110	A.1.24
A76	J. Ray	Evening Meeting Transcript (12/12/00)	A-110	A.1.16
A77	J. Ray	Evening Meeting Transcript (12/12/00)	A-111	A.1.16
A79	J. Ray	Evening Meeting Transcript (12/12/00)	A-112	A.1.3
A80	J. Ray	Evening Meeting Transcript (12/12/00)	A-112	A.1.24
A81	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-113	A.1.22
A82	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-113	A.1.13
A83	L. Sumner	Afternoon Meeting Transcript (12/12/00)	A-114	A.1.1
A84	O. Dixon	Evening Meeting Transcript (12/12/00)	A-114	A.1.1

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Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
A85	O. Dixon	Evening Meeting Transcript (12/12/00)	A-114	A.1.1
A86	O. Dixon	Evening Meeting Transcript (12/12/00)	A-114	A.1.14
A87	C. Lindell	Evening Meeting Transcript (12/12/00)	A-115	A.1.1
A88	C. Lindell	Evening Meeting Transcript (12/12/00)	A-115	A.1.1
A89	C. Lindell	Evening Meeting Transcript (12/12/00)	A-115	A.1.1
A90	J. Ray	Evening Meeting Transcript (12/12/00)	A-115	A.1.2
A91	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-101	A.1.13
A92	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-84	A.1.4/A.1.26
A93	D. Sheppard	Afternoon Meeting Transcript (12/12/00)	A-86	A.1.4/A.1.26
A94	S. Barczak	Afternoon Meeting Transcript (12/12/00)	A-103	A.1.7
B01	D. Kyler	December 12, 2000, Statement	A-116	A.1.22
B02	D. Kyler	December 12, 2000, Statement	A-116	A.1.23
B03	D. Kyler	December 12, 2000, Statement	A-116	A.1.17
B04	D. Kyler	December 12, 2000, Statement	A-116	A.1.19
B05	D. Kyler	December 12, 2000, Statement	A-116	A.1.17
B06	D. Kyler	December 12, 2000, Statement	A-116	A.1.19
B07	D. Kyler	December 12, 2000, Statement	A-116	A.1.2
B08	D. Kyler	December 12, 2000, Statement	A-116	A.1.2
B09	D. Kyler	December 12, 2000, Statement	A-116	A.1.22
C01	P. Blockey-O'Brien	December 10, 2000, Letter	A-116	A.1.16
C02	P. Blockey-O'Brien	December 10, 2000, Letter	A-116	A.1.16
C03	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.22
C04	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.20

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
C05	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.4
C06	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.3
C07	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.2
C08	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.3
C09	P. Blockey-O'Brien	December 10, 2000, Letter	A-117	A.1.4
D01	J. King	December 31, 2000, Letter	A-117	A.1.2
D02	J. King	December 31, 2000, Letter	A-117	A.1.23
D03	J. King	December 31, 2000, Letter	A-117	A.1.2
E01	M. Bass	December 18, 2000, Letter	A-118	A.1.2
E02	M. Bass	December 18, 2000, Letter	A-118	A.1.17
E03	M. Bass	December 18, 2000, Letter	A-118	A.1.17
E04	M. Bass	December 18, 2000, Letter	A-118	A.1.19
F01	S. Barczak	December 12, 2000, Written Statement	A-120	A.1.22
G01	J.H. Lee	January 17, 2001, Letter	A-121	A.1.10
G02	J.H. Lee	January 17, 2001, Letter	A-121	A.1.9
G03	J.H. Lee	January 17, 2001, Letter	A-122	A.1.9
G04	J.H. Lee	January 17, 2001, Letter	A-122	A.1.9
G05	J.H. Lee	January 17, 2001, Letter	A-122	A.1.7
G06	J.H. Lee	January 17, 2001, Letter	A-122	A.1.7
G07	J.H. Lee	January 17, 2001, Letter	A-122	A.1.7
G08	J.H. Lee	January 17, 2001, Letter	A-122	A.1.13
G09	J.H. Lee	January 17, 2001, Letter	A-122	A.1.9

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Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
H01	G.G. Drury	January 19, 2001, Letter	A-123	A.1.2
H02	G.G. Drury	January 19, 2001, Letter	A-123	A.1.22
I01	H.L. Sumner Jr.	January 23, 2001, Letter	A-125	A.1.15
I02	H.L. Sumner Jr.	January 23, 2001, Letter	A-125	A.1.15
I03	H.L. Sumner Jr.	January 23, 2001, Letter	A-125	A.1.6 Table A-3
J01	D. Waller	January 22, 2001, Letter	A-129	A.1.7
J02	D. Waller	January 22, 2001, Letter	A-129	A.1.7
J03	D. Waller	January 22, 2001, Letter	A-129	A.1.11
J04	D. Waller	January 22, 2001, Letter	A-129	A.1.24
K01	S. Barczak	January 24, 2001, Letter	A-130	A.1.3
K02	S. Barczak	January 24, 2001, Letter	A-130	A.1.4/A.1.26
K03	S. Barczak	January 24, 2001, Letter	A-130	A.1.4
K04	S. Barczak	January 24, 2001, Letter	A-130	A.1.4
K05	S. Barczak	January 24, 2001, Letter	A-130	A.1.4
K06	S. Barczak	January 24, 2001, Letter	A-130/131	A.1.4
K07	S. Barczak	January 24, 2001, Letter	A-130	A.1.16
K08	S. Barczak	January 24, 2001, Letter	A-130	A.1.16
K09	S. Barczak	January 24, 2001, Letter	A-130	A.1.4
K10	S. Barczak	January 24, 2001, Letter	A-130	A.1.16
K11	S. Barczak	January 24, 2001, Letter	A-131	A.1.2
K12	S. Barczak	January 24, 2001, Letter	A-131	A.1.4
K13	S. Barczak	January 24, 2001, Letter	A-131	A.1.14
K14	S. Barczak	January 24, 2001, Letter	A-131	A.1.11
K15	S. Barczak	January 24, 2001, Letter	A-131	A.1.11

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
K16	S. Barczak	January 24, 2001, Letter	A-131	A.1.11
K17	S. Barczak	January 24, 2001, Letter	A-131	A.1.26
K18	S. Barczak	January 24, 2001, Letter	A-131	A.1.11
K19	S. Barczak	January 24, 2001, Letter	A-131	A.1.11
K20	S. Barczak	January 24, 2001, Letter	A-131	A.1.21
K21	S. Barczak	January 24, 2001, Letter	A-132	A.1.7
K22	S. Barczak	January 24, 2001, Letter	A-132	A.1.9
K24	S. Barczak	January 24, 2001, Letter	A-132	A.1.11
K25	S. Barczak	January 24, 2001, Letter	A-132	A.1.11
K26	S. Barczak	January 24, 2001, Letter	A-132	A.1.26
K27	S. Barczak	January 24, 2001, Letter	A-132	A.1.26
K28	S. Barczak	January 24, 2001, Letter	A-132	A.1.9
K29	S. Barczak	January 24, 2001, Letter	A-132	A.1.11
K30	S. Barczak	January 24, 2001, Letter	A-132	A.1.24
K31	S. Barczak	January 24, 2001, Letter	A-132	A.1.25
K32	S. Barczak	January 24, 2001, Letter	A-132	A.1.8
K33	S. Barczak	January 24, 2001, Letter	A-132	A.1.13
K34	S. Barczak	January 24, 2001, Letter	A-132	A.1.8
K35	S. Barczak	January 24, 2001, Letter	A-133	A.1.8
K36	S. Barczak	January 24, 2001, Letter	A-133	A.1.8
K37	S. Barczak	January 24, 2001, Letter	A-133	A.1.17
K38	S. Barczak	January 24, 2001, Letter	A-133	A.1.17
K39	S. Barczak	January 24, 2001 Letter	A-133	A.1.17
K40	S. Barczak	January 24, 2001, Letter	A-133	A.1.17
K41	S. Barczak	January 24, 2001, Letter	A-133	A.1.19

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Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
K42	S. Barczak	January 24, 2001, Letter	A-133	A.1.19
K43	S. Barczak	January 24, 2001, Letter	A-133	A.1.19
K44	S. Barczak	January 24, 2001, Letter	A-134	A.1.3
K45	S. Barczak	January 24, 2001, Letter	A-134	A.1.3
K46	S. Barczak	January 24, 2001, Letter	A-134	A.1.2
K48	S. Barczak	January 24, 2001, Letter	A-133	A.1.19
K49	S. Barczak	January 24, 2001, Letter	A-133	A.1.24
L01	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.25
L02	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.6
L03	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.21
L04	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.7
L05	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.14
L06	H.J. Mueller	February 6, 2001, Letter	A-136	A.1.14
L07	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.14
L08	H.J. Mueller	February 6, 2001, Letter	A-135	A.1.26
M01	A. Mager Jr.	January 29, 2001, Letter	A-136	A.1.9
M02	A. Mager Jr.	January 29, 2001, Letter	A-137	A.1.9
M03	A. Mager Jr.	January 29, 2001, Letter	A-137	A.1.21
N01	P. Blockey-O'Brien	May 10, 2000, Letter	A-139	A.1.16/A.1.23
N02	P. Blockey-O'Brien	May 10, 2000, Letter	A-139	A.1.16
N03	P. Blockey-O'Brien	May 10, 2000, Letter	A-139	A.1.13
N04	P. Blockey-O'Brien	May 10, 2000, Letter	A-140	A.1.13

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
N05	P. Blockey-O'Brien	May 10, 2000, Letter	A-141	A.1.22
N06	P. Blockey-O'Brien	May 10, 2000, Letter	A-141	A.1.12
N07	P. Blockey-O'Brien	May 10, 2000, Letter	A-141	A.1.13
N08	P. Blockey-O'Brien	May 10, 2000, Letter	A-141	A.1.3
P01	P. Blockey-O'Brien	May 29, 2000, Letter	A-143	A.1.3
P02	P. Blockey-O'Brien	May 29, 2000, Letter	A-143	A.1.13
P03	P. Blockey-O'Brien	May 29, 2000, Letter	A-143	A.1.17
P04	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.17
P05	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.14
P06	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.13
P07	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.4
P08	P. Blockey-O'Brien	May 29, 2000, Letter	A-145	A.1.22
P09	P. Blockey-O'Brien	May 29, 2000, Letter	A-145	A.1.22
P10	P. Blockey-O'Brien	May 29, 2000, Letter	A-145	A.1.23
P11	P. Blockey-O'Brien	May 29, 2000, Letter	A-145	A.1.22

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Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
P12	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.11
P13	P. Blockey-O'Brien	May 29, 2000, Letter	A-144	A.1.13
Q01	P. Blockey-O'Brien	June 7, 2000, Letter	A-147	A.1.13
Q02	P. Blockey-O'Brien	June 7, 2000, Letter	A-147	A.1.9
R01	P. Blockey-O'Brien	June 4, 2000, Letter	A-147	A.1.16
R02	P. Blockey-O'Brien	June 4, 2000, Letter	A-147	A.1.16
S01	P. Blockey-O'Brien	June 15, 2000, Letter	A-149	A.1.22
S02	P. Blockey-O'Brien	June 15, 2000, Letter	A-149	A.1.16
T01	R. Kilpatrick	June 9, 2000, Letter	A-150/151	A.1.22
T02	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.23
T03	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.22
T04	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.22
T05	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.13
T06	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.23
T07	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.22
T08	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.22
T09	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.17
T10	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.22
T11	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.14
T12	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.16

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
T13	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.22
T14	R. Kilpatrick	June 9, 2000, Letter	A-153	A.1.18
T15	R. Kilpatrick	June 9, 2000, Letter	A-153	A.1.3
T16	R. Kilpatrick	June 9, 2000, Letter	A-153	A.1.19
T17	R. Kilpatrick	June 9, 2000, Letter	A-153	A.1.19
T18	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.13
T19	R. Kilpatrick	June 9, 2000, Letter	A-152	A.1.16
T20	R. Kilpatrick	June 9, 2000, Letter	A-151	A.1.22
U01	R. Kilpatrick	February 22, 2000, Letter	A-154	A.1.22
U02	R. Kilpatrick	February 22, 2000, Letter	A-154	A.1.23
U03	R. Kilpatrick	February 22, 2000, Letter	A-155	A.1.22
U04	R. Kilpatrick	February 22, 2000, Letter	A-155	A.1.22
U05	R. Kilpatrick	February 22, 2000, Letter	A-155	A.1.22
U06	R. Kilpatrick	February 22, 2000, Letter	A-155	A.1.22
U07	R. Kilpatrick	February 22, 2000, Letter	A-156	A.1.13
U08	R. Kilpatrick	February 22, 2000, Letter	A-155	A.1.7
U09	R. Kilpatrick	February 22, 2000, Letter	A-156	A.1.22
U10	R. Kilpatrick	February 22, 2000, Letter	A-156	A.1.22
U11	R. Kilpatrick	February 22, 2000, Letter	A-156	A.1.17
U12	R. Kilpatrick	February 22, 2000, Letter	A-154	A.1.22
V01	R. Kilpatrick	Meeting Transcript (5/10/00)	A-158	A.1.23
V02	R. Kilpatrick	Meeting Transcript (5/10/00)	A-158	A.1.7
V03	R. Kilpatrick	Meeting Transcript (5/10/00)	A-159	A.1.3
V04	R. Kilpatrick	Meeting Transcript (5/10/00)	A-159	A.1.22
V05	R. Kilpatrick	Meeting Transcript (5/10/00)	A-159	A.1.22

Table A-2. HNP SEIS Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
V06	R. Kilpatrick	Meeting Transcript (5/10/00)	A-159	A.1.17
V07	R. Kilpatrick	Meeting Transcript (5/10/00)	A-163	A.1.17
V08	R. Kilpatrick	Meeting Transcript (5/10/00)	A-159	A.1.13
V09	R. Kilpatrick	Meeting Transcript (5/10/00)	A-165	A.1.24
V10	R. Kilpatrick	Meeting Transcript (5/10/00)	A-160	A.1.19
V11	R. Kilpatrick	Meeting Transcript (5/10/00)	A-161	A.1.18
V12	R. Kilpatrick	Meeting Transcript (5/10/00)	A-163	A.1.13
V13	R. Kilpatrick	Meeting Transcript (5/10/00)	A-164	A.1.13
V14	R. Kilpatrick	Meeting Transcript (5/10/00)	A-166	A.1.14
V15	R. Kilpatrick	Meeting Transcript (5/10/00)	A-157	A.1.22
V16	R. Kilpatrick	Meeting Transcript (5/10/000)	A-158	A.1.22
W01	M. Mulligan	November 30, 2000, E-Mail	A-167	A.1.7

A.1 Comments and Responses

A.1.1 General Comments in Support of Nuclear Energy and License Renewal

The record of the public meetings and comment letters contains 13 comments that express general support for license renewal. Three commenters expressed general support for license renewal for HNP (A29, A35, A89).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

Comment: A number of comments supported the conclusion of the SEIS that renewal of the HNP operating licenses would have SMALL impacts on the environment (A30, A34, A63, A83,

A85). Two commenters specifically stated that the environmental impacts of license renewal would not be measurably different than the impacts already experienced as a result of plant operation (A83, A85). Another commenter stated that she believed that there have not been many environmental impacts from HNP, as evidenced by her personal identification of at least 30 different rare or endangered plant and animal species in the vicinity of the plant (A63).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

Comment: Three commenters expressed general support for HNP and nuclear energy (A31, A32, A84, A87, A88). One commenter stated that HNP is committed to being a good neighbor, including contributions to the state and local economy and supplying energy to sustain the quality of life in surrounding areas (A31). The same commenter stated that HNP supplies a reliable energy source as compared to alternative methods of producing power (A32). Another commenter stated that he helped build HNP and was very comfortable with the stringent building guidelines and with how the plant was built (A84). Finally, another commenter stated that the nuclear power plants are reliable and help keep energy costs low (A87). The same commenter asserted that HNP has been a leader in industrial safety and stands high in both NRC and Institute of Nuclear Power Operations (INPO) performance indicators (A88).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

A.1.2 General Comments in Opposition to License Renewal

Comment: A number of commenters stated their opposition to license renewal for HNP (A40, A90, B07, C07, D01, E01, H01, K46). One commenter opposed license renewal because of concern about the health effects on the people living in the vicinity of HNP (A90). Another commenter expressed opposition because the downstream fish and tourist industry would not survive a nuclear accident (H01).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

Comment: Two commenters expressed concern that relicensing of HNP would negatively impact the economy of South Georgia (A55, B08). One commenter stated that thousands of nature-based jobs would be impacted by the NRC's decision to relicense HNP (A55). A

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different commenter stated that denial of license renewal would serve the public interest by setting standards of accountability in safeguarding the public trust (B08).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

Comment: Two commenters stated that relicensing HNP would increase negative environmental impacts on the surrounding area (D03, K11). Specifically, one commenter was concerned that, due to the proximity of the Savannah River Site, Georgia is in danger of becoming a nuclear dumping ground (D03). Another commenter asserted that HNP has been and continues to negatively impact the Altamaha River (K11).

Response: *The comments are general in nature and do not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of these comments.*

A.1.3 License Renewal Review Process

Comment: One commenter questioned whether the licensee for a nuclear power plant could apply for a second 20-year license renewal if it is granted an initial 20-year license renewal (A01).

Response: *The NRC regulations do not prevent a plant from applying for another 20-year license renewal period. The approval of this request would be subject to an additional safety review and environmental review conducted at the time of the application.*

This comment did not result in modification of the SEIS text.

Comment: Two commenters requested that the NRC explain how the impact classifications SMALL, MODERATE, and LARGE are determined based on the data collected (A68, A72).

Response: *The data are analyzed and if no impacts are found, or if the impacts are so minor that they will not destabilize or noticeably alter any important attribute of the resource, then the impact level SMALL is assigned. For example, if a small number of fish are occasionally impinged on the screens for the cooling water makeup, and this does not appear to affect the total population level of the fish, then the impact level assigned is SMALL. If the environmental impacts are sufficient to alter noticeably, but not to destabilize the attributes of the resource, then an impact level of MODERATE is assigned. This impact level would be assigned if the number of fish impinged would cause a noticeable reduction in the number of fish in the river (although still allowing for a viable breeding population). If the environmental impacts are*

clearly noticeable and are sufficient to destabilize important attributes of the resource, then the impact level LARGE is assigned. This impact level would be assigned if the number of fish impinged was large enough to not only be noticed but to eliminate the possibility of a viable breeding population in the river.

These comments did not result in the modification of the SEIS text.

Comment: One commenter stated that the GEIS process does not allow for a site-specific analysis of the actual impacts. According to the commenter, this generic evaluation overlooks major site-specific problems (K01). Another commenter stated that the licensee did not discuss the Category 1 issues (P01). Additionally, one commenter asserted that the NRC has a history of categorizing problems as generic problems, which is not in the public interest (K44). Finally, another commenter requested that the NRC treat all problems and areas of concern as site-specific problems rather than generic industry problems (K45, T15, V03).

Response: *The environmental review process, which is set forth in 10 CFR Part 51, implements the National Environmental Policy Act of 1969 (NEPA). This process provides for the preparation of generic environmental impact statements to avoid the time and expense of repeated reviews of essentially the same material. When an environmental issue has been resolved generically, there is no need to conduct another detailed review of the same issue with respect to a particular application unless there is significant new information related to some aspect of the issue. The technical bases that were considered in developing the GEIS included environmental insights gained from thousands of reactor-years of operating experience, including HNP operating experience. It addresses and draws generic conclusions on 69 environmental issues associated with license renewal. These are Category 1 issues. The NRC staff reviews all of the information it collects for its review, including public comments collected during the scoping phase, to determine whether there is any new and significant information related to the Category 1 issues. If new and significant information is identified, the NRC staff will evaluate the impacts related to that information. The NRC staff performs site-specific analysis for all of the Category 2 and noncategorized issues that are applicable to each plant that applies for license renewal.*

These comments did not result in the modification of the SEIS text.

Comment: One commenter asserted that the NRC is the real energy-planning decisionmaker and the NRC is performing the environmental evaluation of license renewal for a corporation (A79).

Response: *The NRC is an independent agency established by the United States Congress under the Energy Reorganization Act of 1974 to ensure adequate protection of the public health and safety, the common defense and security, and the environment in the use of nuclear*

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materials in the United States. By rule (see 10 CFR 51.95)(c)(2) for details), the NRC staff does not consider the need for power in developing the environmental impact statement for a license renewal application; the NRC's focus is to determine whether the option for operating beyond the 40-year term should be preserved for energy-planning decisionmakers. Energy planning decisions are made primarily by the utility, State agencies, or other Federal agencies.

This comment did not result in modification to the SEIS text.

Comment: One commenter stated that the license renewal process permits the NRC and the nuclear power industry to evade Federal and State laws and other requirements that apply to a request to license a new nuclear power plant. Additionally, the commenter asserted that license renewals are an attempt to circumvent current standards and put the public and the environment at risk (C06, C08).

Response: *There is a fundamental difference between the environmental aspects of siting a new facility versus continuing the operation of an existing one. The license renewal process was developed by the NRC and codified in 10 CFR Parts 51 and 54 through rulemaking. These rules and the underlying GEIS were made available for public comment before they became effective. An applicant for license renewal must continue to meet existing environmental and safety standards to ensure that the plant operates in a safe and environmentally responsible manner.*

These comments did not result in modification of the SEIS text.

A.1.4 Hatch-Specific License Renewal Review and Analysis

Comment: One commenter requested that the NRC conduct site-specific evaluations of the actual impacts of HNP, including consideration of past plant operations, spills and worker contamination, and routine releases listed on the NRC docket for HNP (A56). Two commenters stated that the NRC should review the entire docket for HNP in order to fully understand past problems (A57, K12, P07). One of the commenters stated that a proper review of this information would cause the NRC to deny the application for license renewal (A58).

Response: *The NRC conducted a site-specific evaluation of HNP in accordance with license renewal evaluation requirements (10 CFR Part 51). Routine releases were reviewed in support of the environmental review. The staff is also familiar with significant past events at HNP that affected the environment. A review of the entire docket is not considered necessary, because the NRC's ongoing oversight processes have addressed past problems and trends. Evaluation of past plant operations, accidents, spills, and incidents of worker contamination are part of that ongoing NRC oversight program. This site-specific SEIS addresses environmental impacts of plant operations (and refurbishment, if appropriate) during the license renewal term. Problems*

that are not relevant to the environmental review (e.g., recent operational events) are not addressed in the SEIS.

These comments did not result in modification of the SEIS text.

Comment: One commenter expressed concern that many of the studies used to support the conclusions in the SEIS are extremely dated. The commenter requested that the NRC perform updated studies, including site visits, before HNP is relicensed (K06).

Response: *There have not been significant changes in the operation of HNP in the past 20 years. While river conditions may have changed over time, the staff believes that the data that it used to evaluate environmental impacts (e.g., entrainment and impingement data) provide an adequate basis to conclude that the impacts on the affected resources are SMALL and will remain SMALL for the license renewal period.*

This comment did not result in the modification of the SEIS text.

Comment: A number of commenters were concerned about the NRC's consideration of public comments received during the scoping period (A04, A41, A43, A44, A92, A93, C05, K03). One commenter asked whether and where public comments are answered in the SEIS (A04, K03). Two comments on record stated that they were unable to find where the NRC had addressed their comments in the draft SEIS text (A92, A93). Another comment suggested that all statements submitted orally or in writing be included in the draft SEIS (A43). Two commenters asserted that the NRC did not adequately address or consider oral and written comments submitted by members of the public (A41, C05, K03). One of these commenters asked when and where the comments made at the December 12, 2000, public meeting would be addressed (K03). According to one commenter, if the NRC had considered these comments, it would have denied the license renewal application for HNP (C05). Another commenter requested the NRC to reevaluate all the oral and written comments concerning environmental issues submitted earlier (A44).

Response: *The scoping comments were reviewed for relevance to license renewal issues and summarized in the "Edwin I. Hatch Environmental Impact Statement Scoping Process Summary Report," August 23, 2000. Comments with potential relevance to the environmental review of license renewal at HNP were referred to staff experts for consideration in the draft SEIS. Comments neither relevant to license renewal nor to operating or safety analysis required no further evaluation. Comments outside the scope of license renewal but relevant to the plant operations or safety issues were referred to the appropriate NRC oversight organizations. The objective of the December 12, 2000, public meetings on the draft SEIS was to present the organization and preliminary findings of the environmental evaluation of license renewal. Those questions asked at the meetings that were pertinent to the evaluation and were not answered*

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during the meetings were referred to the staff for further consideration. These comments and the staff's responses are included in this appendix.

In addition, the staff has added a new Part I to this appendix to inform the public of the NRC staff's consideration of relevant comments received during the scoping process to develop the draft SEIS.

These comments resulted in the addition of Part 1 to Appendix A in the SEIS.

Comment: One commenter asked what direct expertise the experts working with the NRC on the environmental analysis have in Southeast watershed hydrology and biology issues. The commenter also asked about other clients served by these experts (A27). One commenter inquired why NRC brought in U.S. Department of Energy (DOE) contractors to contribute to the SEIS, when DOE has already contaminated other sites (C09).

Response: *The experts evaluating the environmental aspects of license renewal are listed in Appendix B. These experts provide technical support for NRC's independent analysis of site and regional information and consultation with other Federal, State, and local experts to support the analysis. With regard to watershed hydrology and biological issues, the team hydrologist and the ecologist have more than 20 years of experience each in reviewing and analyzing the hydrology and ecology issues from a number of diverse ecosystems in various areas of the country and world.*

While the national laboratories are operated for DOE, the laboratory staffs are not DOE employees. Most of the clients using these laboratories' services are other governmental agencies.

These comments did not result in the modification of the SEIS text.

Comment: One commenter found it disturbing that the team present at the public meetings was unable to answer important questions regarding the impacts on the aquatic ecology and hydrology in the region (K04).

Response: *The public meetings were intended to describe the HNP assessment process and to provide another opportunity for the public to raise questions and concerns. Not all of the team's experts were present at the meetings. The unanswered questions were referred to these experts to ensure that they were considered in the final SEIS. These questions, and the answers, are included in this appendix.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the review process is flawed because the use of the GEIS avoids plant-specific reviews in many areas (K02). This commenter requested that the NRC conduct a site-specific analysis using recent data and information, to contact local or regional organizations and specialists, and to fully address the concerns raised with properly documented and easily accessible information (K05). Additionally, this commenter objected to the contents of Appendix D of the draft SEIS, "Organizations Contacted," on the ground that the appendix did not indicate that any nongovernmental, environmental, or conservation organization was contacted (A45).

Response: *The NRC conducted a site-specific evaluation of HNP in accordance with license renewal evaluation requirements (10 CFR Part 51). The Federal, State, and local agencies that were included in Appendix D were consulted to identify any compliance or permit issues or significant environmental issues of concern to the reviewing agencies. The public scoping meetings and scoping comment period are part of the process to obtain information related to significant environmental issues from members of the public, nongovernmental, or conservation organizations, or any other stakeholder who wants to contribute relevant insight, data, or information.*

These comments did not result in modification of the SEIS text.

Comment: Three commenters complimented the draft SEIS and the NRC's environmental review process (A28, A36, A59).

Response: *The comments are general in nature and did not provide any new information. Therefore, no further evaluation was required and no changes to the SEIS were made as a result of the comments.*

Comment: One commenter requested that any documents between the NRC and the licensee be made publicly available (K09).

Response: *All documents between the NRC and the licensee related to license renewal are on the public record and are located in the NRC Public Document Room. They can be accessed via the NRC website or ADAMS. The Public Document Room staff are available to provide assistance by telephone (800-397-4209) or e-mail (pdr@nrc.gov). Public documents are also available online in ADAMS. ADAMS can be accessed through the Public Electronic Reading Room (PERR) from the NRC home page (<http://www.nrc.gov>).*

A.1.5 Refurbishment

Comment: Two commenters raised questions about refurbishment activities at HNP. One commenter requested a definition of refurbishment (A65). A different commenter asked when a

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plant applying for license renewal must indicate whether it will engage in any refurbishment activities (A07).

Response: *Refurbishment activities are those activities that are above and beyond the normal activities required for fueling or to maintain plant function that are performed in anticipation of license renewal. A plant applying for license renewal must indicate any expected refurbishment activities in its license renewal application.*

These comments did not result in modification of the SEIS text.

Comment: The same commenter expressed concern that the NRC did not look at refurbishment beyond normal maintenance activities (A66).

Response: *The application submitted for license renewal by SNC indicated that there would be no refurbishment activities. As a result, there were no refurbishment activities requiring review.*

This comment did not result in modification of the SEIS text.

A.1.6 Land Use

Comment: One commenter recommended that the discussion of speculative "dramatic" post-decommissioning land-use impacts be avoided in Chapter 8 because it is difficult to predict future use of the unrestricted property. The commenter recommended revising the conclusions in Table 8-1 for historic and archaeological resources to SMALL with a revision to the comment (I03).

Response: *The staff agrees that the use of the modifier "dramatically" is unnecessary in making the point and has deleted it. However, because post-decommissioning land use cannot be predicted, the staff will retain a range of possible impacts from SMALL to LARGE for this impact category.*

This comment resulted in a slight modification of the SEIS text in Section 8.1.

Comment: One commenter expressed concern that HNP is exempt from certain regulations, such as the Georgia Coastal Zone Management Act and other local land-use and/or zoning restrictions due to its location. The commenter asked whether these elements are being tracked and if the results could be quantified (L02).

Response: *Table E-1 in Appendix E lists the Federal, State, local, and regional licenses, permits, consultations, and other approvals that are pertinent to current operation of HNP.*

There are some regulations, such as those associated with the Georgia Coastal Zone Management Act (CZMA), that do not apply to HNP because of its location.

The State of Georgia has designated those portions of the State to which the Georgia CZMA applies (Official Code of Georgia Annotated, §12-5-322). Appling County is not included in the program because it is too far inland. The nearest county included in the program is Wayne County, which is approximately 40 km (25 mi) downstream of HNP. Therefore, HNP has not been "exempted" from the Georgia CZMA; the act does not apply to the site. If the State of Georgia were to modify the Georgia CZMA to include Appling County in the future, SNC would be required to comply with the revised requirements.

Similarly, HNP is located in an unincorporated portion of Appling County (most of the land in the County is unincorporated). Appling County has not chosen to apply land-use or zoning restrictions to unincorporated areas. Therefore, HNP has not been "exempted" from land-use restrictions. The restrictions do not apply in that area. If the County were to decide to apply land-use restrictions to unincorporated areas in the future, the County and SNC would have to come to some agreement on how the restrictions would be applied to HNP.

This comment did not result in a modification of the SEIS text.

A.1.7 Water Use and Quality

Comment: Five comments raised concerns about the water temperature in the Altamaha River (A12, A13, A61, A94, J01). One commenter requested that the NRC evaluate the effects on aquatic life from the discharge of water that could potentially be 94 degrees Fahrenheit, even though the Georgia Department of Natural Resources, Environmental Protection Division (GADNR-EPD) permit does not address the issue of a maximum water temperature (A12, A13).

Response: *Heat shock and the thermal plume are Category 1 issues for plants that have cooling towers. Based on information in the GEIS, the Commission found that "Heat shock has not been found to be a problem at operating nuclear power plants with this type of cooling system (cooling-tower-based heat dissipation systems) and is not expected to be a problem during the license renewal term." In addition, the Commission found that "Thermal plumes have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term." The staff has not identified any new and significant information related to these issues and adopts the GEIS conclusions that the impacts from these issues will be SMALL.*

The National Pollutant Discharge Elimination System (NPDES) permit is issued by GADNR, as delegated by the U.S. Environmental Protection Agency (EPA). The NRC does not review or approve NPDES permits. However, the staff did consider the requirements of the NPDES

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permit and impacts associated with recorded maximum discharge temperatures in its evaluation of the environmental impacts of license renewal.

These comments did not result in a modification of the SEIS text.

Comment: One commenter stated that the NRC should conduct a site-specific investigation for severe drought conditions, including an evaluation of the effects on aquatic life and threatened and endangered species (A14, A48). Another commenter stated that the evaluation of water temperature should consider the current drought conditions and that any prior tests should be redone to account for these conditions (A61). A different commenter stated that the SEIS did not adequately address the effects of water withdrawals and blowdown during extreme drought conditions (J01).

Response: *The analysis of water quality and the effect of the discharge temperature on aquatic life was considered over a wide range of temperatures and conditions, including those that would be comparable to a drought.*

These comments did not result in a modification of the SEIS text.

Comment: One commenter expressed concern that the results of the thermal plume model and the field verification survey are not capable of characterizing impacts to the river or temperature deviations resulting from the full 2-unit operation of HNP during low summer and fall flows (G05). Additionally, this commenter suggested that SNC conduct field measurements of the discharge and the resulting temperature plume in the Altamaha River under various flow conditions during the warmer months (G06). And finally, this commenter recommended that the NRC conduct field studies of the thermal discharge on a daily basis during various river conditions and in the critical flow periods during the summer and fall when the ambient water temperature is highest and dissolved oxygen is lowest (G07).

Response: *Based on information in the GEIS, the Commission found that "Thermal plumes have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term." The thermal deviations are analyzed assuming low water flows. Further, the Commission found that low dissolved oxygen has been a concern at one nuclear power plant with a once-through cooling system (unlike HNP) but has been effectively mitigated. It was not found to be a problem at operating nuclear power plants with cooling towers and is not expected to be a problem during the license renewal term.*

The GEIS considers this a Category 1 issue and no new and significant information has been identified by the staff during its review. The staff believes that the thermal plume data obtained in support of the initial licenses provide an adequate basis to conclude that the impacts on aquatic resources are SMALL and will remain SMALL for the license renewal term.

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that the NRC should evaluate reduced water withdrawals, and an emergency drought plan should be developed for times when river discharge drops below a predetermined minimum level (J02).

Response: *Section 4.1.1 addresses water withdrawals and the impact of consumptive loss on the downstream riparian communities and instream biological communities (e.g., mussels and fish) during periods of minimum river discharge. SNC has a procedure titled "E.I. Hatch Nuclear Plant, Drought Contingency Plan for the Altamaha River." It outlines water conservation mechanisms for drought conditions and actions necessary to respond to low river flow/elevation. The plan was developed with input from and consultation with the Corps of Engineers, U.S. Geological Survey, GADNR-EPD, and U.S. Fish and Wildlife Service (FWS). This plan was submitted as part of the Surface Water Withdrawal Permit Application (renewal) in December 1999 and received GADNR-EPD review and approval.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the information on the water withdrawal permit for HNP in the SEIS needs to be updated because the permit was amended in April 2000 to increase the monthly average from 72 million gallons per day to 85 million gallons per day. Additionally, the water-use analysis needs to be updated to consider this increased water use and the drought conditions (K21).

Response: *The water withdrawal monthly averages and water level change calculations have been updated in Section 2.2.2 to reflect the current permitted withdrawals. GADNR evaluated the change before it issued the revised permit. This increase is not expected to affect or be affected by drought conditions.*

The text has been modified in Section 2.2.2 to reflect updated water withdrawals.

Comment: One commenter cited inconsistencies in the number of drinking water wells permitted at the HNP site and the associated identification numbers for these wells (L04).

Response: *The inconsistencies cited by the commenter have been resolved. HNP revised the permit for wells and added two wells for irrigation of ornamental plants after the Environmental Report (ER) was written. This change in the application was communicated to the staff by a letter dated December 15, 2000.*

The appropriate changes have been made in Section 2.2.2 and Appendix E of the SEIS.

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Comment: One commenter stated that past events at HNP, including leaking fuel documented in an inspection report, have increased effluents to the air and the river, causing contamination of water and land and that these events can affect the water quality, etc. (U08, V02).

Response: *This comment involves a concern relevant to current HNP operations. In accordance with 10 CFR 54.30, this issue is outside the scope of license renewal. It has been referred to the NRC operating plant project manager for disposition.*

These comments did not result in modifications of the SEIS text.

Comment: One commenter questioned whether NRC considered projections of future climate changes during the license renewal review (as opposed to historic data). The commenter was concerned about both the effects of the climate changes on the capabilities of the cooling water system, and the effects of cooling water system operation on the environment during extreme weather conditions. (W01).

Response: *The staff used historic data with respect to the cooling water system in its review of the HNP license renewal application. However, whatever changes might occur in the meteorological conditions in the region, HNP will still be required to comply with the regulatory requirements imposed on it through permits (e.g., the NPDES permit). Based on the staff's evaluation of the findings in the GEIS; the licensee's ER submitted as part of HNP's license renewal application; comments received from the public; consultations with other Federal, State, and local agencies; and the staff's own independent review, the staff concluded that the environmental impacts of cooling system operation during the license renewal term are SMALL. Included in this review was the consideration of the environmental impacts during the lowest river flow that has been recorded.*

Concerns related to the effects of climate changes on the capabilities of the cooling water system are operational issues and are outside the scope of the environmental review. The staff has already responded to this comment in a letter to Mr. Michael Mulligan dated January 2, 2001.

This comment did not result in modification of the SEIS text.

A.1.8 Air Quality

Comment: One commenter stated that the SEIS lacks crucial, current information assessing the impact of the region's air quality on HNP, particularly if areas like Macon and Savannah are declared nonattainment areas for ozone in the near future, which could potentially affect surrounding areas, including the HNP site (K32).

Response: *Should these cities be declared nonattainment areas, they will be subject to changes in the Georgia State Implementation Plan. SNC indicated that it did not plan to undertake refurbishment activities for the period of extended operation that would place it outside the bounds of normal plant maintenance activities. As such, if these cities become nonattainment areas, they will not have an impact on HNP. Therefore, this issue is not addressed in the SEIS.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that fine particulate matter suspended in the water vapor emitted from the cooling towers deposits elsewhere in the region. The commenter suggested that these emissions need to be assessed under the Federal Prevention of Significant Deterioration program, specifically in reference to its PM₁₀ (particulate matter, 10 microns or less in diameter) emissions. The same commenter stated that it is unclear if the HNP's Title V permit properly assessed whether or not the cooling towers should be added as a source of emissions, because they are currently not included (K35). Additionally, the commenter requested that the NRC assess the contents of the water vapor from the cooling towers, and mercury in particular (K34, K36).

Response: *The particulate drift from the cooling towers was reviewed in the Final Environmental Statements for HNP and was estimated conservatively at 300 tons/unit-year. Field studies of the drift were performed after the plants began operating. The studies indicated that drift did not have an adverse impact on vegetation or soils. Additionally, there is no plant source that would contaminate the cooling tower water with mercury. This issue was considered a Category 1 issue in the GEIS, and the staff adopted the GEIS conclusion of a SMALL impact for this SEIS.*

These comments did not result in modification of the SEIS text.

A.1.9 Aquatic Resources

Comment: Two commenters expressed concern about the adequacy of the fish entrainment and mortality studies relied upon in the SEIS (G02, G03, G04, K22). Both commenters stated that the studies were conducted over 20 years ago and that the data from those studies do not accurately reflect the current conditions in the Altamaha River (G03, K22). Additionally, one commenter recommended that SNC conduct an assessment of fish entrainment and mortality at HNP under various flow conditions that reflect actual 2-unit operation at low river flows because the intake velocity is often affected by low river flows (G02, G04). This commenter expressed concern that the low-water weir may significantly increase the potential for fish entrainment and that the varying flow could have an adverse effect on the fish, especially during spawning season (G04, G09).

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Response: *Entrainment of fish has not been found to be a problem at operating nuclear power plants with cooling-tower-based heat-dissipation systems such as is present at HNP. Entrainment of fish is not expected to be a problem at this site during the license renewal period. The low-water weir structure was constructed of sandbags only, and it was subsequently dismantled. Although the permit is still valid, its use is unlikely because the structure of the weir is not seismically qualified. This means that SNC could not rely on the use of the weir to direct cooling water into the plant for safety-related loads. In addition, the staff believes that the data on entrainment and impingement that were taken for initial licensing provide an adequate basis to conclude that the impacts on aquatic resources are SMALL and will remain SMALL for the license renewal term.*

The GEIS considers this a Category 1 issue and no new and significant information has been identified by the staff during its review.

These comments did not result in modification of the SEIS text.

Comment: One commenter asked how HNP has been ruled out as the cause for the downstream decline in frequency of several species (K28).

Response: *Based on the plant design, operations, and location, and on information gathered from the relevant resource agencies, the staff did not find any evidence to indicate that plant operations had adversely affected aquatic life. See Sections 2.2.5, 4.1.1, and 4.6 for additional information.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the efforts to restore the native fish populations could increase the impingement and entrainment of adult fish and/or their eggs and larvae. The commenter recommended that the SEIS address the impacts of increasing fish populations and include a detailed explanation of the impacts of the cooling-water system on entrainment of subadult fish, including mitigation measures (M01, M02).

Response: *Entrainment of fish has not been found to be a problem at operating nuclear power plants with cooling-tower-based heat-dissipation systems such as is present at HNP. Entrainment of fish is not expected to be a problem at this site during the license renewal period. With increases in fish populations, the opportunity for entrainment of fish, eggs, and larvae increases. However, it is unlikely that losses due to entrainment would be more than a proportional increase, and therefore would constitute no more than a SMALL impact. The GEIS considers this a Category 1 issue and no new and significant information has been identified by the staff during its review.*

In addition, the staff believes that the data on entrainment that were taken for initial licensing provide an adequate basis to conclude that the impacts on aquatic resources are SMALL and will remain SMALL for the license renewal term.

These comments did not result in modification of the SEIS text.

Comment: One commenter implied that deformed crabs and ulcerated fish taken near the mouth of the river were the result of HNP radioactive and chemical pollution (Q02).

Response: *The latest Environmental Radiation Surveillance Report (1997-Mid 1999) issued by GADNR noted that the radioactivity levels downstream from HNP were insignificant and did not pose any detectable risk for drinking water or for fish. Due to the very small radioactive releases from HNP and the lack of any specific evidence, the staff does not believe the problems described are related to HNP operations.*

This comment did not result in modification of the SEIS text.

A.1.10 Terrestrial Resources

Comment: One commenter stated that since no new construction or increase in operating conditions is proposed as part of the license renewal, adverse impacts to terrestrial resources from continued operation of HNP should be minimal with the exception of radiological impacts (G01).

Response: *The impacts of the HNP license renewal on terrestrial resources are all Category 1 issues and all the impacts are considered SMALL.*

The comment did not result in modification of the SEIS text.

A.1.11 Threatened and Endangered Species

Comment: Two commenters raised questions about the status of the robust redhorse sucker as an endangered species (A10, A11, K14). One commenter stated that the robust redhorse sucker and the shortnose sturgeon are potential endangered species that should be considered in the SEIS (A10, A11). Another commenter stated that the robust redhorse sucker was inaccurately considered to be extinct in the 1970s and is currently present in the Altamaha River (K14).

Response: *The shortnose sturgeon is considered in the SEIS. The robust redhorse sucker is not found in the vicinity of HNP and, therefore, is not addressed in the SEIS (see Section 4.6 and Appendix E). The staff notes that recovery efforts associated with the robust redhorse*

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sucker are centered on the Oconee, Ocmulgee, and Savannah Rivers and that the species is not believed to exist in the Altamaha River.

These comments did not result in modification of the SEIS text.

Comment: One commenter asserted that the draft SEIS did not properly address concerns about the shortnose sturgeon, which the commenter classified as a Federal-listed endangered aquatic species found near HNP (K16). Additionally, this commenter stated that the analysis of the impacts on the shortnose sturgeon is not clear and the data used for this analysis is outdated and fails to consider the changing conditions of the river (K18).

Response: *On August 31, 2000, the NRC staff submitted a biological assessment to the National Marine Fisheries Service's (NMFS's) Southeast Regional Office, addressing the impacts on the shortnose sturgeon from the HNP license renewal. In the assessment the staff concluded that the continued operation of HNP may affect, but is not likely to adversely affect, the shortnose sturgeon. The NRC requested an informal consultation under Section 7 of the Endangered Species Act. This consultation is ongoing. The concerns related to this species encompass operations under both the current license and, if approved, the renewed license. Therefore, this consultation will be completed regardless of the outcome of the Commission's decision regarding license renewal. Further discussion is found in Section 4.6.*

This comment did not result in modification of the SEIS text.

Comment: One commenter asked whether the SEIS analysis considers only Federal-listed endangered and threatened species or also considers State-tracked species (A15).

Response: *The NRC specifically addresses Federally protected species in its evaluation under NEPA. However, the NRC also consulted with the State of Georgia on State species of concern.*

This comment did not result in modification of the SEIS text.

Comment: One commenter suggested that HNP coordinate with the GADNR Wildlife Resources Division (WRD) in the management of the transmission corridors and areas outside the plant operational boundaries to ensure that management practices are not detrimental to protected plants and animals (J03).

Response: *The staff has not identified any new information during its review of the SNC ER to indicate that the impacts of right-of-way maintenance on wildlife would have more than SMALL significance. In addition, correspondence in Attachment C to SNC's ER indicates that the licensee has coordinated the management of the transmission corridors with GADNR-WRD.*

This comment did not result in modification of the SEIS text.

Comment: One commenter requested the NRC contact GADNR-WRD and FWS to investigate efforts to update lists of threatened and endangered species at both the State and Federal level in order to more accurately assess future impacts of HNP on these organisms (K15, K29). The commenter specifically identified the spiny mussel as a species of concern (K29).

Response: *The NRC review team contacted the GADNR-WRD and FWS during its review. As discussed in Section 4.6, the assessment of the potential occurrence of endangered or threatened species in the vicinity of HNP was initiated in December 1997 when SNC requested database information from GADNR concerning known occurrences of State- or Federal-listed species in the vicinity of HNP. SNC commissioned a field study of the HNP site and all transmission lines associated with HNP, as well as a freshwater mussel survey upstream and downstream of HNP. The NRC staff also requested an informal consultation with the NMFS Southeast Regional Office on the shortnose sturgeon. Additional interactions with the FWS and GADNR are described in Section 4.6. Any staff action related to future changes to the Federal and State endangered and threatened species lists will be initiated when the changes are made.*

These comments did not result in modification to the SEIS text.

Comment: One commenter stated that the draft SEIS failed to provide the specific results of the field surveys that SNC commissioned of the region, which makes it unclear as to when the sampling occurred, what was sampled, and who conducted the surveys (K24). Another commenter asked how the studies on aquatic animals such as mussels or the shortnose sturgeon are performed and the type of study performed (A73).

Response: *SNC commissioned Tetra Tech, Inc. to conduct the field surveys to evaluate the presence of plant and animal species listed or proposed for listing by the FWS as endangered or threatened, or listed by GADNR as endangered, threatened, rare, or unusual. These results are included in SNC's ER. The environmental analysis performed in support of license renewal included field surveys on threatened or endangered species and mussels specifically. In addition, previously documented studies related to the life history and thermal tolerances of these animals were reviewed in order to evaluate the impacts of an additional 20 years of operation. Details concerning these field studies are described in the survey references. The NRC reviewed these results and provided a summary of the review in Section 2.2.6 of the SEIS.*

These comments did not result in modification of the SEIS text.

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Comment: One commenter demanded that the NRC conduct new, independent studies for the shortnose sturgeon that account for discharge temperatures and drought conditions (K19).

Response: *In the biological assessment submitted to NMFS (see Appendix E), the staff concluded that operation of HNP is not likely to adversely affect the shortnose sturgeon. In addition, the staff believes that the data used in the biological assessment, which included data concerning the thermal plume, provide an adequate basis to support the conclusion in that assessment.*

This comment did not result in modification of the SEIS text.

Comment: One commenter asked about references to recent analyses of bird population studies (K25).

Response: *Bird species listed or proposed for listing as endangered, threatened, rare, or unusual are discussed in Section 2.2.6 of the SEIS. The field surveys are referenced in Section 4.9.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that sufficient species on or adjacent to HNP property are listed as endangered, threatened, rare, or unusual to warrant permanent shutdown of the plant (P12).

Response: *The existence of such species is not sufficient grounds for shutting down current plant operations. Adverse impacts during the license renewal term are pertinent to this analysis, and the staff concludes that such impacts are SMALL.*

This comment did not result in modification of the SEIS text.

A.1.12 Transmission Lines

Comment: One commenter indicated that Congressional testimony given in 1987 indicated that electromagnetic fields from transmission lines are a serious health risk (N06).

Response: *The SEIS in Section 4.2.2 cites a more recent report in which the National Institute of Environmental Health Sciences (NIEHS) concludes that "ELF-EMF [extremely low frequency-electromagnetic field] exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive*

regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern."

This comment did not result in modification of the SEIS text.

A.1.13 Human Health/Radiological Impacts

Comment: One commenter expressed concern about the release of radioactive contamination from water vapor (A49, A50, K33). Specifically, the commenter stated that contaminated vapor is deposited in the form of precipitation, which makes its way into the food chain (A50). A different commenter stated that HNP does not release radioactive water vapor (A82).

Response: *The cooling water drawn from the river is pumped through the tubes of the plant's main condensers and then sent to the cooling towers. At no time does this cooling water come into contact with the water that passes through the reactor. Therefore, this cooling water cannot be made radioactive by the reactor.*

The text in Section 2.1.3 has been modified to clarify this.

Comment: One commenter stated that State EPD reports show that measurable levels of man-made radioactive contaminants are found in vegetation samples, including rare and threatened species (A51). A second commenter contended that there are elevated levels of radioisotopes in pine needles, grass, etc. (P13).

Response: *The latest Environmental Radiation Surveillance Report (1997-Mid 1999) issued by GADNR shows two vegetation samples with elevated cesium-137 levels at a background location south of HNP. GADNR noted in its report that this activity was not attributed to plant operations. Results from sample locations closer to HNP were within normal, background range. Similarly, vegetation results reported in the GADNR 1995-1996 environmental surveillance report were within normal, background range.*

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that HNP did not tell State agencies that plant emissions include radioactive contaminants during their license renewal consultations (N07).

Response: *The agencies are aware of the level of radioactive emissions from HNP through their own surveillance reports and through review of HNP's radiation monitoring program results.*

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This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the State of Georgia agencies that were contacted do not have expertise in radiation and its effect on species and on the ecology of the region (A91).

Response: *GADNR performs the collection and evaluation of data for the Environmental Radiation Surveillance Report, and has the expertise necessary to collect the data and develop this report. Generally, information requested of other State agencies did not relate to radiation or its effects.*

This comment did not result in modification of the SEIS text.

Comment: Two commenters stated that comprehensive tests on the extent and effects of radioactive contamination offsite should be conducted by completely independent organizations. This would exclude State and local government agencies and Georgia Tech (Q01, T05).

Response: *GADNR conducts its own testing away from the HNP site and documents the results in its periodic Environmental Radiation Surveillance Report. The latest Environmental Radiation Surveillance Report (1997-Mid 1999) issued by GADNR is discussed in Section 2.2.7 of the SEIS. NRC has discovered no evidence to suggest that the current State testing is not independent.*

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that regulatory limits for radiation exposure were not set with health effects in mind, but were instead set so that the industry could operate (A52). Another comment stated that NRC radiation standards have nothing to do with health or environmental protection or worker protection because no testing is performed to determine the actual effects on the population and the environment (N03). A third comment stated that standards to protect public health do not exist, so a claim that there is no significant health impact can not be made (V13).

Response: *The NRC's regulatory limits for radiological protection are set to protect workers and the public from the harmful health effects of radiation on humans. The limits were based on the recommendations of standards-setting organizations. Radiation standards reflect extensive scientific study by national and international organizations (International Commission on Radiological Protection [ICRP], National Council on Radiation Protection and Measurements, and National Academy of Sciences) and are conservative to ensure that the public and workers at nuclear power plants are protected. The NRC radiation exposure*

standards are presented in 10 CFR Part 20, "Standards for Protection Against Radiation," and are based on the recommendations in ICRP 26 and 30.

Numerous scientifically designed, peer-reviewed studies of personnel exposed to occupational levels of radiation (versus life-threatening accident doses or medical therapeutic levels) have shown minimal effect on human health, and any effect was from exposures well above the exposure levels of the typical member of the public from normal operation of a nuclear power plant.

These comments did not result in modification of the SEIS text.

Comment: One commenter expressed concern about radioactive material and specifically isotopes such as tritium, strontium, and cesium in the food chain and the potential for long-term damage, environmental problems, as well as health effects in the fetus, elderly, children, and people with immune disorders (A53). A second comment was that the immune systems of people living within 50 to 100 miles of the plant will have been compromised due to radiation exposure (P06). One commenter raised the concern that goat farms and families with goats located in the area are at greater risk because tritium has a high transfer factor for goat milk available for consumption. (T18). One commenter stated that fish may contain radioactive contamination that may affect their offspring and that will eventually affect humans and their offspring (A54).

Response: *Radioactive strontium and cesium are primarily from man-made sources, including fallout; however, tritium is also produced in the atmosphere. These isotopes are present in the food chain and are released in small quantities from nuclear power facilities. The NRC has set dose limits to regulate the release of radioactive material from nuclear power facilities. The regulations are intentionally conservative and provide adequate protection for the public, including the most radiosensitive members of the population. The licensee maintains an offsite dose calculation manual (ODCM) that describes the methodology and parameters that are used in the calculation of offsite doses caused by radioactive liquid and gaseous effluents. These calculations are performed to demonstrate the licensee's compliance with its technical specifications and NRC regulations. The doses are calculated for the maximally exposed individual and include doses resulting from the grass-goat-milk pathway and from the consumption of fish (taking into consideration bioaccumulation in freshwater fish). The calculated doses resulting from these pathways and others related to the release of effluents from HNP must be below the regulatory limits.*

SNC's monitoring programs measure the amounts released from HNP to the environment as an additional confirmation that they are within the limits set by the NRC. The State's independent monitoring program tests for radioactive contamination in the environment outside the plant.

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These comments did not result in modification of the SEIS text.

Comment: One commenter was concerned about the lack of studies on the health effects to the population surrounding HNP (A69, A70, A71). Specifically, the commenter suggested that the NRC conduct epidemiological studies and an analysis of cancer rates in the community prior to startup of HNP and current cancer rates, especially among children and the elderly (A69, A71).

Response: *An epidemiological study of human health effects before and after HNP was built is beyond the scope of the license renewal process. Numerous scientifically designed, peer-reviewed studies of personnel exposed to occupational levels of radiation (versus life-threatening accident doses or medical therapeutic levels) have shown minimal effect on human health, and any effects were from exposures well above the exposure levels of the typical member of the public from normal operation of a nuclear power plant.*

The radiation effects of normal reactor operation on human health are Category 1 issues. Based on the analysis in the GEIS, the Commission made a generic determination that the radiation effects of normal reactor operation during the renewal term on human health would be SMALL. The staff has not identified any significant new information related to the radiation aspects of human health in the ER, the scoping process, its independent review, or in this comment that would call the conclusions of the GEIS into question. Therefore, the staff relies on those conclusions as amplified by supporting information in the GEIS related to the radiation effects of normal operation during the renewal term on human health.

These comments did not result in modification of the SEIS text.

Comment: One commenter contended that radiological impacts to the environment have not been evaluated for HNP in the draft SEIS and that avoidable impacts to fish and wildlife resources may exist and have not been carefully considered. The commenter also stated that Section 4.3 lacks a discussion of radiological impacts to fish and wildlife and fails to describe actual levels of radiation in the ambient environment or the level of increase in radiation due to the operation of HNP (G08). Another comment stated that the effects of radiation on crops and insects have not been adequately evaluated (P02). This commenter also wondered whether gopher tortoises are contaminated from burrowing into onsite waste (N08).

Response: *The NRC has set regulatory limits related to the doses to workers and members of the public from radioactive materials released from nuclear power plants. The NRC regulations also incorporate, by reference, the EPA's generally applicable environmental radiation standards in 40 CFR Part 190. The regulations are set to protect workers and the public from the harmful health effects of radiation on humans, with the understanding that if levels are kept*

this low, they would be appropriate for animals as well. For clarification, the staff has added the 40 CFR Part 190 limits to the SEIS text.

In the EPA's proposed standards for environmental radiation protection for nuclear power operations (40 FR 23420), the EPA discusses the basis for the dose limits for man and adds that "Standards developed on this basis are believed to also protect the overall ecosystem since there is no evidence that there is any biological species sensitive enough to warrant a greater level of protection than that adequate for man."

The licensee verifies that the doses to the public from radioactive materials released to the environment are within regulatory limits and documents this information in its annual Radioactive Effluent Release Report. Actual releases from HNP are at such low levels that they are unlikely to adversely affect fish and wildlife resources. In addition, GADNR monitors for offsite contamination as documented in its December 1999 report, "Environmental Radiation Surveillance Report: 1997 - Mid 1999." In this report, GADNR concluded that the measured concentrations of radionuclides would have no measurable impact on water, fish, or seafood downstream of HNP.

The text in Section 2.2.7 has been modified to include the 40 CFR 190 limits.

Comment: Three comments related to the magnitude and spread of contamination. One comment stated that radioactive contamination in the river, sediment, and aquatic life are significantly elevated since a 1986 spent fuel pool spill and that soil contamination and radioisotopes in milk are also much higher since the plant started operating (N04). A second comment stated that contamination from HNP has spread as far as Darien (U07). A third comment stated that the extent and magnitude of contamination beyond the plant boundary needs to be evaluated (V08).

Response: *The licensee and GADNR conduct routine environmental sampling at on-site and off-site locations near the plant to measure radiation levels in the environment. GADNR-EPD is responsible for the environmental radiation program that determines if radiation levels in the environment are of sufficient quantity to adversely affect the health and safety of the citizens of Georgia. The latest report issued by GADNR EPD, "Environmental Radiation Surveillance Report 1997 - Mid 1999" included samples from various locations away from the plant and as far downstream as Darien, GA. Types of samples included direct radiation, air, vegetation, milk, soil, groundwater, river water, fish and sediment. Table A-1 in the GADNR report showed trace quantities (i.e., above background) of Co-60, Zn-65, Mn-54, and Cs-137 in river sediments downstream from HNP that were attributed to plant operations. GADNR concluded that the measured concentrations would have no measurable impact to water, fish, or seafood downstream from the plant.*

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The licensee also conducts its own sampling and includes a list and maps of specific sample locations for the Radiological Environmental Monitoring Program (REMP) in a periodically updated Off-site Dose Calculation Manual (e.g., ODCM, Rev. 12, December 2, 1999). Samples include direct radiation, air, milk, fish (or clams), grass or leafy vegetation, surface water, sediment, and drinking water. SNC submitted the results of its REMP in the "Edwin I. Hatch Nuclear Plant Annual Radiological Environmental Operating Report for 1999" as required by the ODCM. Although there were a few instances of samples discernible from background, the results were very small percentages of regulatory limits. No discernible radiological impact upon the environment or the public from plant effluents was found by the licensee as a result of the REMP.

Furthermore, as a result of the 1986 spill of spent fuel water into an onsite swamp, HNP initiated an augmented radiological environmental monitoring program in addition to its ODCM REMP. Results of the program are periodically reported to the NRC and have shown decreasing activities over time. Elevated activities on the order of 10 times background of Cs-137 are found in samples located in the swamp area near the location of the release. Downstream activities are now on the order of background levels and are expected to continue to decrease. Samples will continue to be taken biennially and reported to the NRC to confirm the continuing decreasing trend in radioactivity as a result of the spill. GADNR also evaluated the spent fuel water spill and concluded that the impact to the environment was minimal.

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that Hatch is directly over a limestone aquifer that supplies water to the public through wells, putting this aquifer, and its users, at risk (V12).

Response: As part of their environmental surveillance program for HNP, GADNR collects and analyzes groundwater samples semi-annually at five locations around the plant. These locations are 1.3 km (0.8 mi), 1.9 km (1.2 mi), 2.6 km (1.6 mi), 2.9 km (1.8 mi), and 16 km (10 mi) from the plant. A review of groundwater sample data for a recent 5-year period showed background levels of activity indicating the plant is not adversely affecting the groundwater.

This comment did not result in modification of the SEIS text.

A.1.14 Socioeconomics

Comment: One commenter stated that the plant affects the low-income populations in Appling and Toombs counties (P05).

Response: Environmental justice is discussed in Section 4.4.6, and the staff concluded that offsite impacts related to environmental justice would be SMALL.

This comment is general in nature and does not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of this comment.

Comment: One commenter was concerned with the environmental justice analysis contained in the draft SEIS. Specifically, the commenter stated that the analysis lacks an explanation of how the five parameters listed on page 4-27 of the draft SEIS could migrate to impact surrounding areas or an explanation of what the potential impacts could be (L05). Additionally, this commenter stated that more information is needed to clarify what environmental pathways these parameters would use to impact human populations (L06).

Response: *The staff's evaluation of the five parameters is discussed in Sections 4.1.1, 4.1.2, 4.2.1, 4.5.1, and 5.2 of the SEIS. Specifically,*

- *Surface water-use conflicts - discussed in Section 4.1.1*
- *groundwater-use conflicts - discussed in Section 4.5*
- *electric shock - discussed in Section 4.2.2*
- *microbial organisms - discussed in Section 4.1.2*
- *accident scenarios - discussed in Chapter 5 of this SEIS and in Chapter 5 of the GEIS.*

References to these sections have been added to the discussion of potential environmental justice impacts. Section 4.4.6 has also been restructured to improve clarity.

Comment: One commenter stated that environmental justice is not addressed on pages 3-3 and 4-20 (L07).

Response: *The second column in both Table 3-2 and Table 4-7 is used to list the section in the GEIS (NUREG-1437, published in 1996) in which each issue was addressed. Because of the timing of its publication, the GEIS did not address environmental justice (as indicated in the tables). Because this issue was not addressed in the GEIS, the staff evaluates environmental justice as a plant-specific issue during its review of each license renewal application. In the HNP application, SNC indicated that there were no planned refurbishment activities. Therefore, there are no impacts to evaluate (environmental justice or otherwise) in Chapter 3. Potential environmental justice impacts related to plant operations during the license renewal term are evaluated in Section 4.4.6.*

This comment did not result in modification of the SEIS text.

Comment: One commenter noted that HNP provides 68% of the tax base for Appling County. This commenter stated that economic studies in the Savannah River Site region have shown that it is not healthy for a region's economy to have a nuclear industry contributor that provides even as high as 14% of the local tax base (A37). Another comment echoed this statement that

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high dependency of the tax base on nuclear power is not healthy for the community (V14). A third comment offered that continued operation of the plant negatively impacts the community by reducing the chances of future development (T11).

Response: *The staff is aware that it may not be in the best interest of a county or municipality to have its tax base dominated by a single employer. However, the area around HNP is considered to be severely economically depressed, and the presence of the facility in conjunction with the higher-paid technical workers at HNP is considered to be a potential magnet to market further diversification of the area. In addition, this condition exists under the current licenses and is not an issue related to license renewal.*

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that HNP provides salaries for many people in the community and taxes for the infrastructure, which allows the community to attract more businesses to the area (A86).

Response: *This comment is general in nature and does not provide new information. Therefore, no further evaluation was required and no changes to the SEIS were made as a result of this comment.*

Comment: One commenter stated that the Altamaha River is an area of vital ecological significance and that the livelihood of hundreds of thousands of people depends upon this river and billions of dollars of resources from fisheries, agriculture, tourism, and other coastal activities (K13).

Response: *This comment is general in nature and does not provide new information. Therefore, no further evaluation was required and no changes to the SEIS were made as a result of this comment.*

A.1.15 Archaeological and Historic Resources

Comment: One commenter stated that the SEIS over-emphasizes the significance and potential impacts to historic and archaeological resources on the HNP site. The commenter stated that the sheer magnitude of the information contained in the SEIS confers significance on impacts otherwise determined to be SMALL. The commenter recommended shortening Section 2.2.9 to make it more concise (I01, I02).

Response: *The Commission is required by NEPA to perform a thorough analysis of the issues related to license renewal. Historic and archaeological resources are considered to be a Category 2 issue by the Commission in the GEIS, and thus a thorough analysis is appropriate.*

These comments did not result in modification of the SEIS text.

A.1.16 Postulated Accidents

Comment: Two commenters believed that the use of a \$500,000 cutoff for the SAMA analysis is flawed, and that a human life is worth more than \$500,000 (A24, K07). One commenter stated that the SAMA analysis is grossly deficient (T12).

Response: *No death or fatality attributable to nuclear power operation will ever be acceptable in the sense that the Commission would regard it as a routine or permissible event. However, as with almost every human endeavor, there are risks associated with the action. The NRC does not expect that such accidents will occur, but the possibility cannot be entirely eliminated. However, individual and societal risks from nuclear power plants are estimated to be considerably less than the risk that society is now exposed to from common activities like driving, swimming, flying, or generating electricity from coal.*

In the GEIS, the NRC staff evaluated the likelihood and consequences of severe accidents. Existing severe accident analyses were reviewed and used to predict consequences at all of the sites. In Table 9.1 the staff concluded that

The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small at all sites. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.

Therefore, the staff has considered the probability and consequences of severe accidents in its analysis in the GEIS. For HNP, the staff performed an independent assessment and review and did not identify any new and significant information related to postulated accidents. Therefore, the staff concluded that there were no impacts from postulated accidents beyond those discussed in the GEIS. However, because NEPA also involves the consideration of mitigative actions, SAMAs are evaluated for HNP.

In its SAMA analysis for HNP, the staff evaluated whether there were any improvements that could be made that would substantially reduce the risks from severe accidents such that the benefits of an improvement outweighed the costs of implementation. As part of this evaluation, the staff considered the likelihood (probability) of various severe accidents, the associated releases, and the impacts to the public and the environment. For HNP, the staff found that the licensee had already implemented all of the most cost-effective improvements. Therefore, the staff concluded that none of the candidate SAMAs identified during the review needed to be implemented because they were not cost-beneficial.

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The \$500,000 screening criterion used in the HNP SAMA analysis is a relative measure of the risk associated with severe accidents and cannot be equated with the value of a human life. A simpler analogy might help to explain this situation. Most homes have smoke detectors installed to warn the family if there is a fire. Still greater protection for the family could be achieved by installing an automatic sprinkler system. A system of this type would probably cost a few thousand dollars. Yet few homeowners install these systems. The owners certainly consider the lives of their families to be worth more than a few thousand dollars. But they have judged that the overall risk to the family from fires is not so high as to warrant spending the money it would take to install sprinklers.

This comment did not result in modification of the SEIS text.

Comment: One commenter was concerned that the safety of the public and the environment is not of paramount concern to the NRC, which is highlighted by the SAMA analysis (K08).

Response: *The NRC was established by the United States Congress under the Energy Reorganization Act of 1974 to ensure adequate protection of the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States. The protection of public health and safety is the principal concern of the NRC. The staff has already determined in the GEIS that the impacts of severe accidents are SMALL because the probability of an accident affecting the public is extremely small. Therefore, the impacts of severe accidents is generically resolved. Since the staff did not identify any new and significant information for this issue, no plant-specific evaluation was required. However, SAMAs are a Category 2 issue. In reviewing SAMAs, the staff was looking for cost-effective ways to further reduce the risk from severe accidents. For HNP, the staff did not identify any cost-effective SAMAs.*

This comment did not result in modification of the SEIS text.

Comment: Two commenters were concerned about the possibility of a meltdown at HNP and the estimated number of injuries and deaths (C01, K10), one of whom stated that she submitted an earlier statement, which she believes the NRC has ignored (C01). Another commenter asked the NRC to address the impacts of a meltdown and catastrophic releases to the environment and include the information in the GEIS [SEIS] (K10).

Response: *NRC regulations under 10 CFR 51.53 require license renewal applicants to consider alternatives to mitigate severe accidents (including a loss of coolant accident, which is popularly termed a "meltdown") if the staff has not previously evaluated SAMAs for the applicant's plant in an environmental impact statement or related supplement or in an environmental assessment. The staff's evaluation of this analysis is presented in Chapter 5 of the SEIS. The staff noted, in the course of its evaluation, that the probability of a severe event*

at HNP is considerably less than one tenth of one percent when compared to the risks to which we are generally exposed in society.

These comments did not result in modification of the SEIS text.

Comment: One commenter asked how the total benefit of the SAMAs is analyzed in the Probabilistic Safety Assessment (A76).

Response: *The various screening methods used in the review (e.g., already implemented, not applicable to HNP, cost exceeding maximum attainable benefit) resulted in removing most of the SAMA candidates from further consideration. Each of the nine remaining candidate SAMAs were then evaluated in more detail. Using the HNP Probabilistic Safety Assessment, an estimate was made of the reduction in severe accident risk that would be achieved if a given SAMA were implemented. Using the methodology in NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," that risk reduction was converted into a monetary benefit. This portion of the evaluation considered various benefits (e.g., averted onsite and offsite exposures, averted offsite property damage, etc.). The benefits for each SAMA candidate were then compared with the estimated costs of implementing the change. In all cases the costs far exceeded the benefits. This is not unexpected because the licensee has already implemented a number of changes to the plant in response to earlier evaluations of severe accident vulnerabilities at HNP.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that HNP has a history of accidents and questioned whether these accidents have been addressed in the Probabilistic Safety Assessment (A77).

Response: *The significant operational events that are reported to the NRC are evaluated under the significance determination process, which uses the Probabilistic Safety Assessment to determine the impact the event had on the potential for core damage. Operational events are seldom significant enough to lead to changes in the Probabilistic Safety Assessment.*

This comment did not result in the modification of the SEIS text.

Comment: One commenter expressed concern that the SAMA analysis and aging analysis did not mention leaking fuel rods (N01). This commenter also stated that failure of the spent fuel pool following a Chernobyl-like explosion should have been considered in the SAMA analysis or with regard to aging effects (S02).

Response: *The effects of leaking spent fuel rods (i.e., fuel that has been removed from the reactor and placed in either wet or dry storage) are operational issues and are not a matter for*

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consideration in the SAMA analysis or in license renewal. There are spent fuel pool accidents considered within the bounds of design-basis accidents. But design-basis accidents is a Category 1 issue for which no new and significant information has been identified by the staff during its review.

The probability of a "Chernobyl-like explosion" at a U.S. commercial reactor is extremely low because of the fundamental differences in the design, construction, and operation of U.S. reactors compared to the Chernobyl reactor. Despite these differences, the NRC staff considered what lessons it could learn from the event and took steps to address areas of potential improvement. The results of this study are documented in NUREG-1251, "Implications of the Accident at Chernobyl for Safety Regulation of Commercial Nuclear Power Plants in the United States," March 1989.

It is nevertheless possible to hypothesize various complex scenarios in which a severe accident might have an impact on the spent fuel pool. The staff considered this possibility during its review of a license amendment for the Shearon Harris plant (ADAMS accession number ML003769831). The staff evaluated the potential for a core damage event with a loss of containment integrity leading to an extended loss of spent fuel pool cooling and makeup water. Based on this review, the staff concluded that scenarios of this type that lead to an extended loss of spent fuel pool cooling and makeup water are so unlikely that they fall into the category of "remote and speculative" and would not, therefore, be considered under NEPA. An event of the type described in the comment would also fall into this category.

The reference to leaking spent fuel in relation to the aging analysis is discussed in Section A.1.23 of this appendix.

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that updated seismic data should be used in the analysis (R02).

Response: *Seismic vulnerabilities were considered for HNP during SNC's Individual Plant Examination of External Events (IPEEE). SNC submitted the results of its study to the NRC on January 26, 1996. The staff completed its review of the HNP IPEEE and forwarded the results to SNC on October 23, 2000. The seismic analysis used in the HNP IPEEE bounds all known historic earthquake data for the area, including earthquakes in Charleston, South Carolina. Therefore, the staff has considered the best seismic data available. The licensee did make some plant modifications to satisfy the seismic evaluation criteria. These modifications were completed in 1995.*

This comment did not result in modification of the SEIS text.

Comment: One commenter expressed concern that the meteorological data used in the offsite release calculations are deficient because (1) buoyant plume rise was not modeled and (2) the calculations used only 1 year's worth of site meteorology (N02). The commenter further questioned the usefulness of such limited meteorological data given the large variations in weather, and especially in rainfall, and reiterated that the meteorological data used in the analysis of a possible meltdown at HNP did not cover a sufficient length of time (C02, R01).

Response: *Buoyant plume rise was not modeled in SNC's offsite release calculations. The staff is aware of the sensitivity of plume heat content and, thereby, buoyancy on dose consequence calculations. Increasing the plume heat content tends to decrease early fatalities and long-term consequences. Therefore, the release models assumed by the applicant are considered more conservative than a buoyant plume model and are acceptable.*

More than 1 year's worth of meteorological data was considered as discussed in Section 5.2.2.2 of the SEIS. SNC performed calculations comparing meteorological data for the years 1995 through 1997. Results indicate that 1997 data were conservative for the 3-year period from 1995 to 1997. There is a possibility that the year of meteorological data may not represent all possible conditions. This factor would introduce some uncertainty into the results. As discussed in Section 5.2.4 of the SEIS, the evaluation of the SAMA risk-reduction potentials did not explicitly consider uncertainties. However, the margins between the costs and the benefits for the most likely SAMAs are so large that even if the risk-reduction benefits were a factor of 10 greater, all of the SAMAs would still have costs greater than the benefits. Therefore, the staff finds the use of the 1997 meteorological data based on a review of the meteorological data for the years 1995 through 1997 adequate for use in SNC's offsite release calculations in light of the margins between the costs and the benefits for the most likely SAMAs.

The potential effects of heavy rainfall were considered by SNC in its January 26, 1996, response to Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities." The licensee used a theoretical greatest depth of precipitation of 24.8 inches in 72 hours. (Using the same relationship, the greatest depth of precipitation in 24 hours would be approximately 16 inches.) The staff reviewed SNC's submittal and concluded that the licensee's IPEEE process (which included external floods) was capable of identifying the most likely severe accidents and severe accident vulnerabilities and that the IPEEE met the intent of Supplement 4 to Generic Letter 88-20. The comment did not provide any information that would cause the NRC to change its conclusion.

These comments did not result in the modification of the SEIS text.

Comment: One commenter stated that local historic and ecologically significant sites would be lost forever in the event of a catastrophic accident (T19).

Response: *Although the comment is somewhat general in nature, the staff agrees that the potential impacts of a severe accident to the surrounding area could be very large. That is why so much emphasis has been placed on preventing and mitigating severe accidents. Offsite consequences have been considered in both the GEIS evaluation of severe accidents and the HNP-specific evaluation of potential SAMAs. The main reason that the SAMAs that were evaluated were not cost-beneficial is that the probability of such an event is so low. The reasons for this low probability include (1) the design, maintenance, and operational controls imposed on U.S. nuclear reactors and (2) earlier efforts (e.g., Generic Letter 88-20, Individual Plant Examination for Severe Accident Vulnerabilities," and its supplements) to identify and mitigate any potential vulnerabilities to severe accidents.*

This comment did not result in modification of the SEIS text.

A.1.17 Spent Nuclear Fuel/Fuel Cycle

Comment: A number of commenters expressed concern about the effects of onsite spent fuel storage at HNP (A17, B03, B05, E02, E03, K37, K38, K39, K40, P04, V06). Specifically, one commenter stated that the draft SEIS lacked information on the onsite casks to determine future environmental impacts (A17). Two commenters stated that the establishment of the independent spent fuel storage installation (ISFSI) and its impacts must be considered (P04, V06). Another commenter was concerned about the effects of storage on marine resources and coastal estuaries supported by the Altamaha River (B03). The same commenter stated that the proposed outdoor storage is an unproven technology that introduces another significant threat to public health and natural resources (B05). A different commenter asserted that storage of spent fuel at HNP puts agricultural productivity, seafood industries, the tourism industry, the forestry industry, and the south coastal areas at serious risk (E02). This commenter also stated that license renewal results in an additional 20 years worth of spent nuclear fuel, which will increase the risk to the surrounding citizens, environment, and economy (E03).

Three comments indicated that the doses from ISFSI casks will stream into the surrounding area (T09, U11, V07). One commenter questioned whether SNC would be allowed to continue storage of waste at HNP if a permanent repository is unavailable (K38). This commenter was concerned about the long-term environmental effects of storing spent fuel because there is very little knowledge about the casks (K39). Finally, this commenter stated that it is imperative that the SEIS include a proper analysis of the HNP's waste generation and future waste generation and the impacts such generation will have on the surrounding community and regional ecosystems (K40). One commenter stated that spent fuel casks should not be used (P03). Another commenter asked if onsite storage of nuclear waste in casks is occurring at other facilities (A19).

Response: *Onsite storage of spent nuclear fuel is a Category 1 issue. The safety and environmental effects of long-term storage of spent fuel onsite has been evaluated by the NRC and, as set forth in the Waste Confidence Rule, the NRC generically determined that such storage could be accomplished without significant environmental impact. In the Waste Confidence Rule, the Commission determined that spent fuel can be stored onsite for at least 30 years beyond the licensed operating life, which may include the term of a renewed license. At or before the end of that period, the fuel would be moved to a permanent repository. The GEIS and the SEIS are based upon the assumption that storage of the spent fuel onsite is not permanent.*

The NRC has a certification process for casks, found in 10 CFR Part 72. The Holtec International HI-STAR 100 cask design used by HNP was approved by the NRC by rulemaking on September 3, 1999 (64 FR 48259). The NRC issued a safety evaluation report (SER) and environmental assessment as part of the review of the application for design certification. Surface dose limits for the HOLTEC HI-STAR 100-cask system are specified in technical specifications based on conservative estimates for loaded casks, although they are expected to be lower. It should be noted that these surface dose limits are lower than those found in 10 CFR Part 71 for packaging and transportation of radioactive material. In addition to the direct radiation considerations, all cask designs are evaluated for leak tightness to prevent effluent releases to the environment.

In its SER, the NRC found that the cask meets the requirements for providing adequate radiological protection to licensee personnel and members of the public. Nonetheless, Hatch must still comply with 10 CFR 72.104 annual dose limits to a real member of the public during normal operations and anticipated occurrences. These annual dose limits are 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other critical organ as a result of exposure to all sources of radiation from licensed activities. The 10 CFR 72.104 limits for ISFSIs are as protective as the 10 CFR 20.1301(d) limits that would apply to power reactor operations without an ISFSI. The 72.104 limit applies to all licensed activities including effluent releases from the power plant, direct radiation from the ISFSI and power plant, and any contributions from any other fuel cycle facilities that may expose a member of the public to radiation outside the controlled area. Workers are similarly afforded the same level of protection found in 10 CFR 20, Subpart C, NRC's occupational dose limits. Doses to members of the public and workers must be maintained as low as reasonably achievable (ALARA) and are, therefore, expected to be less than the established dose limits.

The dose to any member of the public resulting from a cask design-basis accident is limited to the more limiting 5 rem total effective dose equivalent; or the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) of 50 rem. In addition, the lens dose equivalent will not exceed 15 rem and the shallow

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dose equivalent to skin or to any extremity will not exceed 50 rem (10 CFR 72.106). These limits are as protective as dose limits to workers during normal operation.

Although there are no dose limits for biota, there is no known evidence that indicates that other living organisms are very much more radiosensitive than man. Therefore, the dose limits for workers and the general public for normal operation and design-basis accidents should provide adequate protection of human health and the environment.

Site-generated spent fuel is being stored in onsite facilities licensed by the NRC until a permanent repository is operational for receiving shipments of spent fuel from nuclear power reactors. The issue of ultimate disposal of spent fuel is not yet resolved, and the disposal site for spent fuel is not yet licensed. The NRC's Waste Confidence Rule (10 CFR 51.23(a)) holds that the high-level waste repository will be available in the first quarter of the 21st century.

The first dry storage installation was licensed by the NRC in 1986. As of February 27, 2001, there are 18 nuclear power facilities using dry storage.

These comments did not result in modification of the SEIS text.

Comment: One commenter asked whether onsite storage of spent nuclear fuel is considered in the license renewal rule and did not agree with the conclusion that spent nuclear fuel has a small impact (A18).

Response: *The impacts of onsite storage of spent fuel during the renewal term are evaluated in Chapter 6 of the SEIS. The Commission found (10 CFR Part 51, Subpart A, Appendix B, Table B-1) that spent fuel from an additional 20 years of operation can be safely accommodated onsite at all plants if a permanent repository or monitored retrievable storage is not available, and that the associated impacts are SMALL. This is a Category 1 issue for which the staff found no new and significant information.*

This comment did not result in modification of the SEIS text.

Comment: One commenter asked whether the NRC considered other environmental conditions such as hurricanes, flooding, and other weather-related phenomena in its spent fuel analysis (A20).

Response: *Natural phenomena were considered in evaluating the efficacy of onsite spent fuel storage in the licensing of onsite spent fuel storage in either pools or dry casks. The GEIS indicated that the impacts of the storage of spent fuel are SMALL. This is a Category 1 issue for which the staff found no new and significant information.*

This comment did not result in modification to the text of the SEIS.

A.1.18 Decommissioning

Comment: One commenter expressed concern that the utility will walk away from the plant and not decommission it (T14, V11).

Response: *NRC regulations (10 CFR 50.75) require each licensee to provide certification of financial assurance for decommissioning. The licensee remains responsible for the site until the license is terminated and the site is released for unrestricted use (or restricted use under certain limited circumstances as provided in NRC regulations). The NRC can require a licensee to pay a civil penalty for violations of any rule, regulation, or order, or for violation of any term, condition, or limitation of any license.*

These comments did not result in modification of the SEIS text.

A.1.19 Alternatives

Comment: One commenter was concerned about the assessment of the costs of spent nuclear fuel and suggested that such an assessment be included in the SEIS (A21, A22, A23).

Response: *The cost of storing spent fuel is outside the scope of license renewal. In this SEIS, the staff is comparing the environmental impacts of license renewal with the impacts of alternatives.*

These comments did not result in modification of the SEIS text.

Comment: One commenter favored license renewal for HNP because the environmental impacts from alternative energy sources are greater (A62).

Response: *This comment is general in nature and did not provide new information. Therefore no further evaluation was required, and no changes to the SEIS were made as a result of this comment.*

Comment: One commenter stated that jeopardizing natural resources is not justified by the need to keep HNP operating when there are other lower-risk alternatives (B04).

Response: *This comment is general in nature and did not provide new information. Therefore no further evaluation was required, and no changes to the SEIS were made as a result of this comment.*

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Comment: One commenter asserted that the staff should consider conventional forms of power generation and newly emerging technologies that are far less hazardous and far more efficient on the basis of accurate and complete assessment of long-term costs and benefits (B06).

Response: *The alternatives to license renewal are discussed in Chapter 8 of the SEIS. The staff did not perform a cost-benefit analysis, which is outside the scope of the license renewal process. Instead, the significance of the environmental impacts of the proposed action were compared to the environmental impacts of the alternative actions. In all impact categories the significance of the environmental effects of the proposed action are SMALL. The alternative actions may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.*

Potential advances in the various technologies are not considered in the evaluation because they are speculative.

This comment did not result in modification of the SEIS text.

Comments: One commenter stated that rather than relicensing HNP, the NRC should proceed with research of renewable energy sources that are not as risky (E04). One commenter stated that several alternative energy sources were not adequately considered and that there is a clear need to increase renewable and clean sources and increase efficiency (T16). Another commenter stated that the NRC needs to consider other alternatives to license renewal for HNP such as natural gas, purchased power from nonutility generation, energy efficiency, and distributed technologies (K41). The same commenter stated that the NRC needs to consider alternatives over the life cycle of HNP and include the storage of spent nuclear fuel in the analysis (K42). Finally, this commenter asserted that the application and the NRC analysis fail to consider renewable energy sources in combination with energy efficiency and cleaner generation (K43). One commenter stated that some available, clean alternatives, such as those used by the Tennessee Valley Authority, were not considered (V10).

Response: *Review of alternatives to license renewal is limited to those that could reasonably be expected to replace the energy base load supplied by HNP. Potential advances in the various technologies are not considered in the evaluation because they are speculative.*

Chapter 8 of the SEIS evaluated the use of renewable energy sources such as wind, solar, hydropower, geothermal, wood energy, municipal solid waste, and other biomass-derived fuels. However, these sources were eliminated as "reasonable alternatives" to the relicensing of HNP because the generation of 1690 MW(e) of electricity as a base load supply using these technologies is not technically feasible. Discussion of the probable environmental impacts

resulting from a mix of alternatives that could potentially meet this supply is considered in Section 8.2.4.13.

These comments did not result in modification of the SEIS text.

Comment: One commenter indicated that Georgia is exporting power that is equivalent to HNP's production. This commenter asked if this power could be retained (T17).

Response: *If the utility stopped exporting power out of the State, then the current out-of-state users would have to find a new source of power. This approach would simply shift the impacts of an alternative energy source (as evaluated in Chapter 8) to some other location. But the impacts would still be higher than the proposed action in some impact categories.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the NRC should consider the information in the Georgia Power Company (GPC) Integrated Resource Plan, which identifies ways the company can manage without license renewal (K48).

Response: *This comment raises issues related to the need for power and to alternatives considered.*

As discussed in Section 1.2, the NRC does not have a role in the energy-planning decisions of State regulators and utility officials. The NRC has determined that the applicant need not discuss the need for power in its application to renew its operating license [10 CFR 51.53(c)(2)].

With respect to the consideration of alternatives presented in Chapter 8, the staff evaluated feasible alternatives for replacing the power generated by HNP. All of the feasible alternatives involved the use of fossil fuels and had environmental impacts that were larger than those of the proposed action in some impact categories. The staff reviewed GPC's 1998 Integrated Resource Plan and found that GPC had also concluded that fossil fuel units were the most feasible alternatives for baseload power generation.

This comment did not result in modification of the SEIS text.

A.1.20 Conclusions

Comment: One commenter asked for a definition of "not so great" in the following statement: "... that the Commission determine that the adverse environmental impacts of license renewal for HNP are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable" (C04).

Response: *The term "not so great" in this statement indicates that the integrated assessment of the environmental impacts of license renewal are not of a large enough magnitude that the Commission would reject SNC's request for license renewal. As discussed in the preamble to the June 5, 1996, final rule modifying 10 CFR Part 51 (61 FR 28473), "Given the uncertainties involved and the lack of control that the NRC has in the choice of energy alternatives in the future, the Commission believes that it is reasonable to exercise its NEPA authority to reject license renewal applications only when it has determined that the impacts of license renewal sufficiently exceed the impacts of all or almost all of the alternatives that preserving the option of license renewal for future decision makers would be unreasonable."*

This comment did not result in modification of the SEIS text.

A.1.21 Compliance Status and Consultations

Comment: Two comments focused on the need to reevaluate permits and conditions initially issued to HNP. One commenter expressed the concern that due to the current drought conditions in the region, the permits and conditions initially issued to HNP need to be reevaluated based on current laws and regulations (A46). Another commenter challenged the conclusion of the SEIS that license renewal will not have any adverse impacts on the Altamaha ecosystem and that the licensee's application for renewal needs to comply with current State and Federal water usage and pollution control standards (A47).

Response: *Appendix E of the SEIS provides a list of current licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities pertinent to the operation of HNP. These permits and licenses are granted and administered by agencies other than the NRC. The licensee is required to operate in compliance with its permits, minimizing the impacts to the environment. Almost all permits must be renewed on a periodic basis.*

These comments did not result in modification of the SEIS text.

Comment: One commenter stated that NRC should review potential future NPDES discharge temperature limits to more effectively gauge whether the plant can comply with State and Federal requirements (K20).

Response: *The NPDES permit is issued by GADNR as delegated by the EPA. The NRC does not review or approve NPDES permits. However, the staff did consider the requirements of the NPDES permit in their evaluation of the environmental impacts of license renewal.*

This comment did not result in modification of the SEIS text.

Comment: One commenter asked how the owners of HNP will address the impacts of new Safe Drinking Water Act regulations that will become effective in the next 3 to 8 years (L03).

Response: *SNC is required to meet the current regulations of the Federal Safe Drinking Water Act for HNP as shown in Table 1-1 and Table E-1 of Appendix E. If the regulations for the Safe Drinking Water Act are changed, SNC will be required to meet these new regulations at HNP. The new regulations were not addressed in this SEIS because they have not yet been promulgated.*

This comment did not result in modification of the SEIS text.

Comment: One commenter recommended that the NRC should establish a process for ensuring effective and timely coordination between the NRC, the licensee, and resource agencies regarding fish impingement and entrainment because further coordination may be needed during the license renewal period. More specifically, the process should address initiation of agency coordination in response to expected changes in fish populations (M03).

Response: *Impingement and entrainment of fish and eggs has not been found to be a problem at operating nuclear power plants with cooling-tower-based heat-dissipation systems such as is present at HNP and they are not expected to be a problem at this site during the license renewal period. The GEIS considers these to be Category 1 issues.*

The NRC will inform the appropriate resource agencies about any future relevant problems of which it becomes aware and will cooperate with those agencies to resolve the problems.

This comment did not result in modification of the SEIS text.

A.1.22 Operational Safety Issues

Comment: The record contains numerous comments related to operational safety issues with regard to the HNP facility, administrative and procedural issues, and specific past events. The issues relating to physical plant facilities include

- HNP has a history of accidents, suggesting significant threats with continuing operation (B09)
- the view that no accidents have occurred at HNP, only operational events that occur at every plant (A81)
- the obsolete design of HNP and the history of accidents (H02, U03)
- degradation of equipment continues, and the plant is experiencing forced shutdowns (U04, V16)

Appendix A

- the facility piping system is inadequately held together with pipes displaying wall thinning and pitting (T20)
- the concern over the lack of a containment dome for protection from the accidental release of radioactive contaminants (B01, T13)
- the use of the torus vent system would gas south Georgia and is not acceptable (P09)
- the concern about whether HNP has post-accident sampling from the stack (P08)
- flooding from a failure of the dam at Lake Sinclair could impact the plant and the ISFSI (T08, U10, V05)
- HNP is located in an earthquake zone; hurricanes and wildfires also pose a threat to the plant (T01, U09, V15).

Issues related to plant administration and procedures include

- concern about evacuation procedures and the ability to evacuate in time to protect the public (N05, P11, S01)
- an opinion that, due to poor personnel practices, poor facility conditions, maintenance, and management, and unacceptable damage and risk to the immediate environment, HNP should be shut down immediately (U12)
- worker contamination problems have been ongoing (T10, U06)
- individuals have operated the plant while under the influence of drugs and alcohol (U01)
- the negligence of NRC in not providing the Federal Emergency Management Agency with appropriate documents related to potential accidents (C03)
- the need to address special precautions in the SEIS for flooding situations (F01).

Issues related to specific past events include

- a June 2, 1995, inspection report that indicated leaking fuel had led to increased effluents to the air and the river (T04).
- a January 8, 1993, inspection report that documented that Hatch dumped radioactive sludge on the ground and this would have seeped into groundwater. There were also problems with upending contaminated drums and with soil at a waste oil storage area (T07, U05, V04).
- events in 1986 and earlier that released contamination to the environment (T03)
- a 1999 Georgia report confirming that Hatch has contaminated sediments far downriver (T03).

Response: *These comments involve safety concerns that are relevant to current HNP operation. In accordance with 10 CFR 54.30, these issues are outside the scope of license renewal. They have been referred to the NRC operating plant project manager for disposition.*

Note that because HNP is a boiling-water reactor (BWR), it has a typical containment structure used for BWRs. Pressurized-water reactors use the dome structure. The containment structure at HNP is briefly discussed in Section 2.1.2 of the SEIS.

These comments did not result in modification of the SEIS text.

A.1.23 Age-Related Safety Issues

Comment: The record contained eight comments associated with age-related safety issues (A02, B02, D02, P10, T02, T06, U02, and V01). One comment inquired about the major differences between the safety inspection performed for license renewal and the regular safety inspections for continued operation (A02). Other commenters expressed concern about relicensing HNP due to its age, aging equipment, and obsolete design (B02, P10, T02, T06, U02), or because operating any nuclear reactor beyond the time for which it was designed is taking a big chance, the consequences of which are unacceptable (D02, V01).

Response: *These comments are outside of the scope of the staff's review of the environmental effects of renewing the HNP licenses. However, they involve concerns that are relevant to the extended operation of the facility and have been referred for consideration in the license renewal safety review.*

These comments did not result in modification of the SEIS text.

Comment: One commenter expressed concern that the SAMA analysis and aging analysis did not mention leaking fuel rods (N01).

Response: *The effects of leaking spent fuel rods (i.e., fuel that has been removed from the reactor and placed in either wet or dry storage) are operational issues and are not a matter for consideration in license renewal.*

This comment did not result in a modification of the SEIS text.

A.1.24 Miscellaneous

Comment: One commenter asked if Southern Company is spending \$14 million to proceed with the HNP license renewal (A25).

Response: *The NRC does not evaluate the cost-benefit of renewing the license. The cost of renewing the license is the sole responsibility of the licensee and not considered to be a part of this SEIS.*

Appendix A

This comment did not result in a modification of the SEIS text.

Comment: One commenter asked about the possibility that Southern Company would not find license renewal economically feasible (A80).

Response: *The decision about whether or not license renewal is economically feasible rests with the utility and other energy-planning decisionmakers (such as State utility boards). Some utilities have permanently shut down nuclear units based on economic factors.*

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that GPC has not pursued means to reduce peak demands sufficiently (K49).

Response: *This comment is general in nature and does not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of this comment.*

Comment: One commenter asked which portion of the SEIS the NRC contracted PNNL to prepare (A26).

Response: *PNNL was contracted to assist the NRC in the technical evaluation of environmental impacts (with the exception of the SAMA analysis).*

This comment did not result in a modification of the SEIS text.

Comment: One commenter asked if there would be a periodic recheck of the Probabilistic Safety Assessment results (A75).

Response: *The Probabilistic Safety Assessment has become a very important tool to the Commission and to the licensees. A number of licensees, including SNC, plan to update the information periodically.*

This comment did not result in modification of the SEIS text.

Comment: One commenter requested that the NRC put a copy of all documents related to this license renewal process into the regional library (A64).

Response: *Copies of all the major documents were provided to the Ohoopsee Regional Library System in January 2001. The library is now included on the distribution list for future NRC*

documents associated with HNP license renewal. This is in addition to making the documents available through the Appling County Library.

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that, despite industry claims, nuclear plants do pollute the environment (V09).

Response: *This comment is general in nature and does not provide new information. Therefore, no further evaluation was required, and no changes to the SEIS were made as a result of this comment.*

Comment: One commenter requested that HNP provide improved public access areas for bank fishing and pier fishing along the Altamaha River (J04).

Response: *This request is outside the scope of license renewal. It has been referred to the licensee for whatever action it deems appropriate.*

This comment did not result in modification of the SEIS text.

Comment: One commenter requested that GADNR, FWS, and NMFS receive copies of all the inspection reports, violations, and past contamination events to the river, nearby wetlands, and the site itself that occurred and are documented in the docket so they can see how HNP has negatively affected the environment (K30).

Response: *If these agencies request information of this nature, the NRC will supply it to them.*

This comment did not result in modification of the SEIS text.

A.1.25 Technical Clarifications and Concerns

Comment: One commenter noted the geographical misprint in Section 2.2, Air Quality, where the plant's location is mistakenly referred to as being in "western" Georgia (K31).

Response: *This text was apparently intended to state that the HNP site is west of Savannah. This error has been corrected in the SEIS text.*

Comment: One commenter noted that throughout the document, there are references to both a GEIS and a draft SEIS. Clarification of the document format is needed (L01).

Appendix A

Response: *The Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS) was published in 1996 as NUREG-1437. The draft SEIS is the document that was produced for the Hatch License Renewal, which was published as Supplement 4 to the GEIS (NUREG-1437). This document was published as a draft for comment in November 2000 and is now published as a final report. The draft and final SEIS have the same identification number (NUREG-1437) as the GEIS because they are viewed as an extension of the GEIS. The GEIS addressed all issues and gave conclusions related to the generic issues (Category 1 issues). The supplements are site-specific. They review the GEIS's conclusions on the Category 1 issues and address any new and significant information. The site-specific supplements also address the Category 2 (site-specific) issues.*

Chapter 1 has been modified to clarify the relationship between the GEIS and this SEIS.

Additional technical clarifications enumerated by SNC are addressed separately in the table immediately following this section of the appendix (I05, I06, I07, I08, I25, I27).

A.1.26 Format and Presentation

Comment: Six comments on record indicated the need for clear links between the questions asked by the public and the responses or resolution in the SEIS (A05, A06, A42, A92, A93, K02). One commenter stated that the scoping comments should be included in the draft SEIS so that the people who are following the renewal process can see where their comments are addressed in the EIS (A05). This commenter also stated that, in general, the SEIS does not present the public comments and their resolution in a clear, easily accessible manner and that the current document appears to have completely dismissed valid site-specific comments (A42, K02). Another commenter asked if there is a location linking questions asked, the information required for analysis, and the conclusions drawn (A06). This commenter further indicated that it is difficult to follow the evaluation, especially of those concerns of specific interest to the public (A92, A93).

Response: *Scoping comments were addressed in the scoping summary report ("Edwin I. Hatch Environmental Impact Statement Scoping Process Summary Report," August 23, 2000). Those comments relevant to environmental review have now been included in Appendix A, Part I, in response to public comments.*

These comments resulted in the addition of Part 1 to Appendix A in the SEIS.

Comment: One commenter noted that generic issues are scattered throughout the document, which makes reviewing the document very difficult. It was suggested that an easy reference of the generic issues and 10 CFR Part 51 for the Category 1 and 2 issues be included in the final SEIS (A09).

Response: 10 CFR Part 51, Appendix B, Table B-1 enumerates each issue by topic and category. In this SEIS, the issues are divided up between the chapters that address broad issues (e.g., impacts of operation). Within each chapter the issues are tabulated by category at the beginning of each relevant section.

This comment did not result in modification of the SEIS text.

Comment: One commenter suggested that inclusion of an index in an appendix in the draft SEIS would assist the public with reading and understanding the document (A60).

Response: The staff believes that the Table of Contents in the SEIS is sufficient to direct readers to specific topics of interest.

This comment did not result in modification of the SEIS text.

Comment: One commenter stated that the draft SEIS fails to present the public with documentation between the numerous agencies and industry representatives [e.g., the FWS regarding mussels, salamanders, and sturgeon] (K17). This commenter added that the agencies consulted about potential future impacts on local species need to be documented more clearly in the GEIS [SEIS] (K27).

Response: The chronology of the NRC staff's environmental review correspondence is found in Appendix C. This includes correspondence with FWS. Although not exhaustive of all contacts made during the review, Appendix D lists the agencies consulted, especially those with regulatory jurisdiction over local species. The biological assessment to evaluate the impact of the proposed license renewal on the shortnose sturgeon is found in Appendix E. Correspondence between SNC and FWS and GADNR related to terrestrial and freshwater mussel surveys were included in the ER and the NRC's review of this information is discussed in Section 4.6 of this report.

These comments did not result in modification of the SEIS text.

Comment: One commenter asked that NRC be more specific when reporting the studies conducted for animal and plant populations (K26).

Response: The SEIS provides results of the staff's review of the environmental impacts of HNP license renewal. In accordance with standard practice, many of the details supporting this evaluation do not appear in the document, but are available in the references.

This comment did not result in modification of the SEIS text.

Appendix A

Comment: One commenter asked that NRC submit all referenced documents (e.g., the Office of Nuclear Reactor Regulation office letter) with the draft SEIS (L08).

Response: *It would be impractical for the staff to supply all references with the draft SEIS. All key references (e.g., the application, the draft SEIS, the office letter) are available electronically through either the public portion NRC's document management system, the NRC web page, or both. Other references are available through various other sources. The NRC staff will assist the EPA staff in locating any references that it needs for its review.*

Additional format and presentation clarifications suggested by SNC are addressed separately in Table A-3, immediately following this section of the appendix (I04, I26).

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
104	1-9	Table 1-1, 7 to 16	Some permits include "state" in the requirement column description. To clarify that the permits are state and not federal, SNC recommends adding the word "state" to the items described. Also add the identified words for clarification.	Requirement Column: <u>State</u> air quality <u>State drinking</u> water quality <u>State</u> storm water discharge State <u>NPDES</u> discharge permit <u>State</u> solid waste landfill See the revised Figure 2-3 attached which identifies the location of wells 4 and 5.	Clarified as suggested
105	2-4	Figure 2-3	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.		Updated number of wells; replaced figure
106	2-11	32 and 34	SNC recommends clarification of description of mixed waste and hazardous waste.	HNP also provides for <u>accumulation and</u> temporary onsite storage of mixed wastes, which contain both radioactive and chemically hazardous waste. Storage of radioactive material is regulated by the NRC under the Atomic Energy Act of 1954 (AEA), and <u>accumulation and temporary</u> storage of hazardous wastes is regulated by the U.S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act of 1976 (RCRA).	Clarified as suggested
107	2-12	1	A copy of the ODCM is only included if the ODCM was revised during the year.	Includes the ODCM as an appendix <u>if it is revised during the year covered by the report</u> (Southern Company 2000a).	Corrected to reflect actual practice
108	2-14	1	From review of preceding text and review of plant drawings, the off-gas recombiner building should be included in this description.	The major system components are located in the turbine building, <u>off-gas recombiner building</u> , and in the waste gas treatment building.	Clarified as suggested

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
109	2-14	34 to 36	Per our review of HNP FSAR and year 2000 49 CFR, it appears that 171 through 185 would apply to HNP.	Solid waste is packaged in containers to meet the U.S. Department of Transportation requirements in 49 CFR Parts 171 through 477-185 . Disposal and transportation are performed in accordance with the applicable requirements of 10 CFR Part 61, and Part 71, <u>and 49 CFR Parts 171 –185 respectively.</u>	Reference changed to 49 CFR Parts 171 to 180; Parts 181 to 185 are not used
110	2-15	1	Please add text to clarify that number is for disposed waste.	From year to year, the volume of radioactive contaminated waste generated will vary. The average value <u>of disposed waste</u> at HNP over the past 5 years is about 320 m ³ (11,300 ft ³).	Clarified as suggested
111	2-20	6	Permit has been revised since application to allow a change in monthly average. This change in the application was communicated to the staff by letter dated December 15, 2000.	SNC is permitted (Georgia Department of Natural Resources [GADNR] Permit 001-0690-01) to withdraw a monthly average of up to 273,000 m³/d (72 million gpd) <u>322,292 m³/d (85 million gpd)</u> with a maximum 24-hour rate of up to 392,000 m ³ /d (104 million gpd). As a condition of this permit, SNC is required to monitor and report withdrawals.	Revised to reflect change, with the metric number rounded to 323,000 m ³ /d

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
112	2-20	31	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Although the current permit indicates four <u>six</u> onsite wells, there are actually only three wells providing groundwater for domestic and process use. <u>Wells four and five provide water for irrigation of ornamental vegetation.</u> The fourth <u>sixth</u> well was intended to provide makeup water for a wildlife habitat pond that was not completed; therefore, the well has not been installed.	Corrected
113	2-21	4	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Change "three" to "five"	Updated
114	2-21	37	SEIS states that HNP is located in western Georgia. Various other references to HNP location state south central Georgia.	Change "western" to "south-central".	Corrected
115	2-28	15	Drinking water samples are not included in the REMP	Shoreline sediment and water samples from the Altamaha River, and drinking water samples .	Corrected

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
116	2-28	30	For clarification between ODCM results and REMP make the following changes.	Southern Company reported the following estimated whole body doses to the most limiting member of the public for 1999: approximately 0.00064 mSv/yr (0.064 mrem/yr) based on vegetation, fish, and sediment results from the HNP environmental monitoring program (Southern Company 2000b); - approximately 0.00074 mSv/yr (0.074 mrem/yr) based on gaseous and liquid effluent releases (Southern Company 2000a). <u>For 1999, dose estimates were also calculated based on radioactivity detected in the environment and attributed to plant operations as part of the REMP.</u> <u>Southern Company reported the following potential whole body doses to the most limiting member of the public for 1999:</u> <u>approximately 0.00046mSv/yr (0.046 mrem/yr) based on vegetation, 0.00013 mSv (0.013 mrem/yr) based on fish, and 0.000049 mSv/yr (0.0049 mrem/yr) based on sediment (Southern Company 2000b).</u>	Clarified and corrected as suggested
117	2-33	21	States that the US 1 widening project is expected to be "undertaken" within 5 years. However, the reference document states that this project is anticipated to "begin" within 5 years. "Undertaken" implies that it will be completed in that time frame.	Change the wording "expected" to "anticipated" and "undertaken" to "begin".	Clarified as suggested

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
118	2-38	21	In Table 2-13 the last number in the 30-40 Miles column is incorrect.	Change this number from 82,270 to 87,270.	Corrected as suggested
119	2-42	24	The text refers to one "historical site" known to exist on the HNP site, the Bell Cemetery. While the phrase "historical site" is not defined, its use within the section entitled "Historic and Archaeological Resources at HNP" can suggest an unintended meaning. This is because related regulations define "site" as a location of a significant event, activity, or structure [36 CFR 60.3(l)] and "historic property" as something included in, or eligible for inclusion in, the National Register [36 CFR 800.2(e)]. NRC does not seem to suggest that the Bell Cemetery has historical significance and, in fact, cemeteries or even graves of historical figures ordinarily are not considered eligible for inclusion in the National Register (36 CFR 60.4). As communicated in SNC letter, dated August 11, 2000, Plant Hatch is required by "Georgia Power's Human Remains Policy" to protect any known or discovered cemeteries or burial grounds whether it is a historical site or not.	Only one unrecorded historical site is known to exist on the HNP. This is the Bell Cemetery is indicated...	Slight modification to wording
120	4-26	25	See comment for Page 2-42, Line 24	Delete the word "historic"	"Historic" removed

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
121	4-26	32 to 35	The text seems to suggest that SNC would have to perform a formal study to determine the likelihood of cultural resources being present before, for example, logging. A requirement for performing cultural resource evaluations has not been required of previous license renewal applicants. For HNP and the previous plants, NRC indicated that studies in the area found cultural resources and NRC imposed on the applicants only the standard of care. There is no apparent basis for treating HNP differently and the discussion on an evaluation should be deleted.	Such activities may include not only operation of the plant itself but also land management-related actions such as ground disturbance. Since the plant site has not been subjected to an intensive cultural resources field survey to identify and record all cultural resources, and landscape modification or ground disturbance of previously undisturbed areas should be preceded by a cultural resource evaluation to fulfill obligations under the National Historic Preservation Act of 1966 and implementing regulations.	Text modified to better reflect how the potential for future disturbance should be managed

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
I22	4-31	16, 18	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Change "yield" to "use" Add to end of paragraph: Two smaller wells for irrigation of ornamental vegetation were placed in service in early 2000. Those wells typically draw 9000 GPD each and are used as needed.	Clarified as suggested
I23	4-32	10	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Add to end of paragraph: Irrigation wells four and five are also located in the Floridan Aquifer. A sixth well has been permitted in the Miocene Aquifer but has not been constructed.	Additional information included as suggested
I24	4-34	33	Clarify text to edit description of shortnose sturgeon. As written the text could imply differences from other shortnose sturgeon	Thus, an additional 20 years of operation of HNP should not affect the viability of the Altamaha River shortnose sturgeon or result in any population decline.	Wording clarified

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
125	4-34	35	Section 7(2) of the Endangered Species Act reads as follows: "Each Federal agency shall, in consultation with and with the assistance of the Secretary (of Interior), insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or modification of habitat of such species...which is determined..to be critical, unless such agency has been granted an exemption for such action. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available." Both the NRC and SNC biological assessments for the shortnose sturgeon are based on the "best scientific and commercial data available" and indicate that the impact would be small. The conclusion at the end implies that this is potentially an open item. SNC recommends that preliminary be deleted.	Based on the results of the NRC biological assessment, it is the staff's preliminary conclusion that the impact to the shortnose sturgeon is SMALL and that mitigation is not needed.	The staff agrees and has clarified this position

Table A-3. SNC's Comments and Staff Responses

No. ^(a)	Page ^(b)	Line Nos.	Comment	SNC's Proposed Resolution	Disposition
I26	6-2	16 to 20	Table 6-1 appears to contain an incomplete listing of GEIS Sections.	Add Section 6.6 to the GEIS Sections column in Table 6-1.	References added
I27	8-3	34	There are currently no known or identified Historic and Archaeological resources on the Plant Hatch site. Text implies that there are currently "known" resources and implies that the Visitors Center is one of them. These resources should be included in the socioeconomic paragraph and not under a heading titled "Historic and Archaeological Resources. SNC also recommends revising conclusion as stated in the General Comments section.	<u>Historic and Archaeological Resources:</u> The potential for future adverse impacts to known or unrecorded cultural <u>historic and archaeological</u> resources at the HNP site following decommissioning will depend on the future use of the site land. Known resources and activities include the current Visitors Center and associated interpretative efforts that are funded and maintained by SNC. Eventual sale or transfer of the land within the plant site could result in adverse impacts on these resources should the land-use pattern change dramatically.	Slight changes in wording to clarify

(a) Comment numbers I01 through I03 are from SNC's letter (p.A-124) to which this table was attached.

(b) Page numbers refer to pages in the draft SEIS.

A.2 Public Meeting Transcript Excerpts and Comment Letters

LETTER A (Transcript)

Transcript of the Afternoon Public Meeting on December 12, 2000, in Vidalia, Georgia

[Introduction by Mr. Cameron]

[Presentation by Ms. Carpenter]

[Presentation by Mr. Burton]

A01 Ms. Barczak: Sarah Barczak. This is somewhat related to what you are talking about, but after this 20-year license renewal extension is granted, is that the last chance to renew it, or will they be able to reapply? I was just curious.

Mr. Burton: I don't know whether the Atomic Energy Act allows for additional extensions. I don't know if anyone else here can answer that.

Ms. Carpenter: I was looking at Butch, because I honestly don't know either. I'm not sure if there's an exact length of time that they say, you know, right now it's 20 years they can extend the license, but I'm not sure that there's a limit to that, to be honest with you. I'd have to look it up and we'll have to get back with you on that, but I'm not sure that they give an actual limit.

Mr. Cameron: Is the question can there be a third, in other words, another renewal of the license application? Barry, do you have some information on this for Sarah?

Mr. Zalzman: Sure. My name is Barry Zalzman, also with the Nuclear Regulatory Commission. It's my understanding that the renewed license becomes the new operating license for the facility, and that new license would have an expiration date, and that license could as well, be renewed at some point in the future subject to the same stringent standards recognized in the additional period of operation. So the safety reviews, the same environmental reviews, the same level of inspections would also be conducted at that time.

Mr. Burton: All right. Yes, I did want to say, because as I mentioned before, the technical aspects of operating the plant is really not the limiting factor; it's really the economic. So should there be allowances to extend beyond that as Barry mentioned, we would look again at the technical aspects and see if the applicant is able to continue to operate the plant and meet its current licensing basis into an extended period. We would look at that just as we're looking at it now.

Ms. Carpenter: And the exact same would go for environmental, if that would occur. We'd have to look at the environmental aspects again for an additional period.

A02 Ms. Gres: My name is Dusty Gres. My question to you is, what are the major differences between the safety inspection that you do for the license renewal, as opposed to the regular safety inspections you do for continued operation?

Mr. Burton: Good question. The review that we are performing for license renewal, as I mentioned before, there have been -- the original license renewal rule was promulgated in 1991, and it was amended in 1995. Part of that amendment was somewhat of a narrowing of the focus of the license renewal review. What we do for license renewal, is we really focus on what we call "passive, long-lived structures, systems, and components." What we have found is that active systems, such as valves and pumps and things like that, should they experience some sort of degradation, the fact that they are active, it is relatively easy to recognize and address that. In fact, much of the work that we do, and much of the procedures and processes we have set up lend themselves to recognizing those things.

As part of the development of Part 54, we recognized that there are some structures and components that are not active and that are long-lived, and whose age-related degradation can actually occur and it's not easily recognized. So what we try to do in the staff review, is to look at the application and see how the applicant has identified that universe of structures and components, and identify what aging effects those structures, systems, and components are likely to experience, and that they have programs in place to manage that aging. So to answer your question, the difference between what we're looking at in license renewal versus what we look at more regularly at the operating plant is a really, much more focused review on those things that are long-lived and passive. I hope that answers your question.

[Presentation by Mr. Kugler]

A04 Ms. Barczak: During the process I was just wondering would the Draft EIS that we all have to read through -- why weren't the comments that were received from everyone -- the correspondence included in those?

Mr. Kugler: They were reviewed and considered in our development of the draft. We do not -- you mean, specifically included in an appendix or somewhere?

A05 Ms. Barczak: Correct. There's an appendix that, you know, shows something and et cetera, et cetera, but following what their concerns were, is hard to do when you're just looking at, you know, a letter that was received from Georgians for Clean Energy.

Mr. Kugler: I understand what you're saying. The way we have normally addressed this is we issue a summary of the scoping process, and for Hatch this was issued on August 23rd of this year, which discusses the scoping process, where the comments came in from, and then it lists the comments and the resolution for those comments. We have not, at least up until this point, included them in the EIS itself. We do include the comments that come out of this part of the process in an appendix to the EIS.

A05 Ms. Barczak: Is the August 23rd comment summary available anywhere on the website? Well, you said that they were pulled together and looked at?

Mr. Kugler: Right. We haven't put the Scoping Summary on the web site. There is probably no reason we couldn't do that. I understand what you're saying. In other words, that's a piece

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of the process that would be convenient to have in a handy location. We could certainly consider –

Mr. Cameron: Can we put the Scoping Report on the web site?

Mr. Kugler: I don't see any reason we couldn't. I think the only concern we might get into would be, you know, we don't want it to get cluttered to where it gets hard to find things, but I don't see that as a particular problem in this case, so we can certainly consider doing that.

Mr. Cameron: Okay. The transcript from the meetings is on the web site?

Mr. Kugler: The transcript from the meeting is there. That would only have comments that occurred during the meeting. It wouldn't have the written comments that came separately, so to get the whole picture –

[Discussion]

Ms. Sheppard: Thank you. My name is Deborah Sheppard, and this is a follow-up question to the one that was just asked.

A06 You said earlier that you took into consideration the comments that were made publicly and in writing, and you followed those up with additional research. Is there a location where you can link the question and the concerns with exactly what information you sought and what the conclusion was?

Mr. Kugler: I don't believe we have anything that provides that sort of a direct link between the two. In some cases it might be fairly obvious. For instance, for the radiological off-site monitoring question there is a specific location where we discuss the report from the Georgia Department of Natural Resources, and we talk about radiological impacts, but other comments, it might not be clear where in the report that any changes we made, or anything we included show up in response to those comments, other than the general section. For instance, if a comment was on alternatives, it would certainly be Chapter 8, but there's nothing that would tell you specifically, you know, this piece in Section 8 is where that comment was addressed.

A92 Ms. Sheppard: I guess, just as a point of public information, I believe those of us who are attempting to follow this process are in a very difficult situation to be able to follow your thinking as you evaluate this. I would like to suggest that when people come to a meeting such as this one and make written comments, they are doing about all they can do. We don't have huge staffs to follow this and it makes it extremely difficult for us to really understand whether you've addressed the comment and what your thinking is. So if there's a way to -- I will just issue that as a criticism of the process. Thank you.

Mr. Kugler: Okay. I understand what you're saying. I guess, what I would say in terms of the way the process moves forward, the draft is not completely written at the time that we work through the comments. They do kind of run in parallel, but we would probably have to go back

after the draft was completed if we were going to really show a direct -- here's where the comment was made and here's where it appeared. I'm not sure whether we can do that readily, but I understand your concern.

[Discussion]

Mr. Zalzman: Let me offer this. This is Barry Zalzman again from the staff. We have examples of a number of these earlier Supplemental Environmental Impact Statements in the back of the room. The important thing is when we go from the draft to the final stage, we de-aggregate all the comments and enumerate them by category, and give you a direct map so you can see the section of the report that is actually addressing a change from the draft to the final. The question I think that you're raising, deals with the scoping process. When we went to the Scoping Summary Report is there a mechanism that connects that report to the draft EIS? Is that the specific question?

Ms. Sheppard: That a regular person could access in a reasonable amount of time.

Mr. Zalzman: Let me just talk a moment about the Scoping Summary Report that is available in the Public Document Room -- the Electronic Public Document Room, as well as the room that is accessible in Rockville, Maryland. We also made a point of making sure that the public also had it available at the Applying Public Library, to make sure that locals had insight, so those that had a desire to actively participate in the process could actually see that.

The question of how do we build a bridge between the scoping activities and the Environmental Impact Statement is always a challenge for any of the Federal agencies.

What we tried to do with the Scoping Summary Report, recognizing that this is a unique process that is different than if we were to license a nuclear power plant from the start. From the start, everything is open for a nuclear power plant license; everything is subject to a normal review. For license renewal, we have a Generic Environmental Impact Statement that already addresses about a hundred issues that we already believe to be within the scope of license renewal. We have to deal with those along the way. The issues that we're seeking public engagement on during the scoping is, is there something beyond those hundred, that you being proximate to the site, may be aware of to help inform the Agency as we begin on these?

So, as Andy mentioned, there are number of issues where the Agency was already going to look at that issue in detail. So when you brought that issue to us, it was already within the scope of the environmental review. What we're trying to do is isolate those that are unique -- that we have not looked at -- unique to the area that we were not familiar with, to inform the Agency so we can do a more detailed review.

We did have a number of issues that were of interest to members of the public that we attempted to bridge within at least the Table of Contents on the draft. You have good organization on where these issues can be found. That is our attempt at trying to deal with the public engagement issue.

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If you have a specific interest in a specific issue area, at least the Table of Contents will isolate it for you, to help you look narrowly to see the discussion that we provided and the rest of the issues that were raised under the scoping, but I will say that we will take the comment that was raised, "Is there a better way to bridge it?" -- We will consider whether or not we can do a better job with that.

- A93 Ms. Sheppard: I'd just like to say with all due respect, to everybody within the NRC, whether you evaluate the generic issues and the way all of those things are handled, to a layperson, many of the unique biological and overall environmental considerations to this particular river system are not generic issues. So, you know, I hear what you're saying about reviewing the Table of Contents, but it is still extremely difficult to see how specific work was done in this area to address specific concerns to us. Thank you.

[Presentation by Ms. Parkhurst]

- A07 Ms. Barczak: The question that I have is, how far ahead or in the future did the nuclear reactor for the plant project what future refurbishment activities there would be? All the way through 2034 and 2038, or do you know?

Ms. Parkhurst: Through the license renewal period they have to, you know, consider what they have to do between now and license time just to keep their plant going, and then there's the question of what additionally has to be done to maintain the plant during that additional period --the renewal term, and what then is required that would be considered a major refurbishment.

- A09 Ms. Sheppard: Thank you. I was afraid I had missed something when I was reviewing the report because I was trying desperately to find some easy reference and I did see the locations scattered throughout, but just as another observation, if you are actually asking members of the general public to review a document like this, if I can't find it, you know, you're acting on maybe a very unrealistic assumption of what people are capable of doing in reviewing your work.

Ms. Parkhurst: That's a good comment, thank you. I think that we will make sure that we have that referenced.

[Discussion]

Mr. Kugler: Are you indicating basically that your preference would have been to see it organized in such a way that they were listed in the same way as in Part 51, I'm not entirely clear on what you would have liked to have seen.

Ms. Sheppard: Perhaps including Part 51 as part of the document with a reference to refer to that would be useful. If you receive the document like this and believe it's a whole and complete representation of the process and you're trying to find lists that are referred to, you can't find them. That's the problem. So maybe merging the two documents would be a solution.

A10 Mr. Holland: On Slide 30 you mentioned something about threatened and endangered species. You didn't give any particular categories, so I'd like to talk about two in particular.

A10 The Short-nosed Sturgeon -- was there any possibility that you had a problem there with the Short-nose?

Ms. Parkhurst: I've got a discussion coming up on that exact issue.

A10 Mr. Holland: How about -- there's another one that appears to be heading toward the threatened or endangered species list, which is the Robust Redhorse Sucker. Has this particular animal showed up in that area?

Ms. Parkhurst: I don't recall that right off. I have an aquatic ecologist who was supposed to be here today who could answer that for you. Unfortunately, he was in Detroit and unable to leave the airport. He's snowbound.

[Presentation by Ms. Parkhurst]

A11 Mr. Shaw: This is Doug Shaw. This is a species that -- It's one that has avoided getting on the Federal endangered list by agreement among several parties, but it is a rare species nonetheless, and we were just curious about that.

Ms. Parkhurst: Thank you. I'm sorry, I don't know the answer to that, but it is something that I will make sure that we look at if we haven't already.

Mr. Cameron: Okay. Thank you. Other questions on the areas that we've covered so far on specifics? Sarah

A12 Ms. Barczak: I had a question about the -- I was going to drop this in my comments, but I'll ask it now while you can answer it. On the heat effects that were looked at, it looked like specifically in regard to the Sturgeon population, although I'm sure it was looked at in other ways, I know that the EPD, Environmental Protection Division, does require river monitoring and quarterly reporting of the temperature, the discharge temperature maximum. There isn't from what I'm aware, what I've been told by the EPD, a maximum discharge temperature required within the permit for Hatch. The temperature listed in the GEIS, the maximum temperature in the mixing box was listed at 94 degrees Fahrenheit in the summer, and 54 degrees Fahrenheit in the winter. I was wondering if the Nuclear Regulatory Commission, though a permit required by the EPD is not required, is going to look at that impact of having a 94 degree Fahrenheit maximum discharge temperature. Is that going to be looked at? I know there's no permit requiring that to be looked at, but --

Ms. Parkhurst: Are you asking in terms of whether NRC is looking at it for the Hatch Plant? The discharge temperature?

Ms. Barczak: Yes. For Hatch specifically.

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Mr. Cameron: Can I just ask, to make sure that we all understand what the implications of Sarah's questions are, and Sarah, correct me if I'm wrong on this. If the Category 1 issue was bounded by a certain temperature and the Hatch permit is possibly above that temperature, then would that constitute significant new information that would cause that Category 1 issue to be looked at as a Category 2 issue? Is that what you're asking?

A12 Ms. Barczak: Yes, and that in the water-use section, where it refers to the Georgia EPD permit for Hatch, the temperature monitoring and the quarterly date and even monitoring being done, it doesn't -- that permit doesn't address the maximum discharge temperature. So I'm asking is it possible for the NRC to go above and beyond, knowing that there isn't a discharge temperature issue there, although the permit is not in place.

Mr. Cameron: Okay. Thank you, Sarah.

Mr. Kugler: Okay. Let me try to make sure I understand it. I think what you're asking is that since the permit does not limit the maximum temperature, is there something that the NRC will do since a higher discharge temperature could potentially affect the aquatic life, is that? Okay.

A12 Ms. Barczak: The person I had spoken with at the EPD said that for once-through plants, they generally have a maximum discharge temperature of 90 degrees Fahrenheit. Then he confirmed that there wasn't a maximum discharge temperature for Hatch. Then knowing those two numbers, I wondered if that's something that should be addressed.

Mr. Kugler: Okay. I think I understand the question. I would probably have to speak to our aquatic ecologist to get a full answer, but one point that I'll make is that I believe the reason that there is a limit for the once-through cooling plants, is that the volume of water they are putting back into the river is much greater than the volume of water that Hatch will be putting back into the river. So the effect on river water temperature and on the aquatic life in the river would be much greater. The amount of water that Hatch is putting back into the river is a much smaller percentage of the river flow, and so its effect on the overall temperature in the river is much smaller. I would, without absolutely knowing for sure, but I believe that is probably why the Georgia Department of Natural Resources did not impose a specific limit for them. We will need to talk to our, you know, the specialist to gather more information on that.

Mr. Cameron: That will be considered as a comment to the Draft EIS to be addressed.

A13 Mr. Holland: Just a comment. Just because the permit does not address the issue of water temperature, I don't think that excuses Plant Hatch from breaking the law of the water quality issues. I've heard this before in other areas, other than Plant Hatch, so I think you might need to take another look at it.

Mr. Cameron: Okay. Thank you, Mr. Holland. Any other questions right now before we move on? Okay. Go ahead over there and then we'll come back down here.

A14 Ms. Gres: Dusty Gres. I do want to say that while I don't represent a particular organization, I live three miles west of the plant directly on the river. So my concerns are primarily river

quality. I do want to know when you considered the heat impact and when you did your environmental studies, did you make specific considerations of the fact that right now the temperature of the water has been abnormally high because of drought conditions which have been predicted to continue for a considerable period of time? We have noticed a considerable temperature increase in the river itself, and we want to know what impact you looked at in terms of the additional temperature increase, on the fact that the river itself is abnormally warm.

Ms. Parkhurst: I'm sure. First off again, heat shock is not considered a problem for cooling tower plants. What you are putting out there is usually, you know, in a once-through cooling system you've got water coming in, it's going through condensers, it's coming out hotter and it doesn't recycle. Here we've got the recycling effect. I don't know what the exact temperature of the discharge is, but again, it's a Category 1 issue for good reason. One of the things they do consider is the differences like you say, from drought years and so on. It certainly is -- it is something we look at the overall averages and kind of like the lower and upper bounds. That's part of the standard analysis here.

I think maybe we ought to go on because the next thing we're looking at is water use and quality. We'll kind of work right into this next one.

Mr. Cameron: Before we do, let me tap in right here with -- is it Doug?

A15 Mr. Shaw: Thank you. Doug Shaw again. I've got two quick questions, I think they're quick, about the endangered species and the potential impact to fish. I'm looking for clarification. I read that this is a Federal review and a Federal action that you are looking at. Does that mean you only look at Federally-endangered or threatened species, or do you also look at State-tracked species, those species that are tracked by the State Natural Heritage Commission, or DNR.

Ms. Parkhurst: I believe we look at the DNR species. Yes.

Mr. Shaw: The Natural Heritage Commission is part of the DNR.

Ms. Parkhurst: Yes. That's part of the analysis.

[Presentation by Ms. Parkhurst]

A17 Ms. Barczak: On page 6-7, under "Onsite spent fuel", the Commission found: "The expected increase in the volume of spent-fuel from an additional 20 years of operation can be safely accommodated onsite with small environmental impacts through dry or pool storage at all plants if a permanent repository or monitored retrievable storage is not available."

A17 What does that really mean? Is it possible that if a permanent repository or monitored retrievable storage isn't available, that it's fine to continue operations at Hatch with storing waste onsite? Does this mean that onsite storage of highly radioactive waste at Hatch could permanently remain on the cement storage slab outside as the staff concluded further in that

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paragraph? How can long-term environmental effects of dry cask storage at Hatch be known at this time when the first three casks, casks that have never been used before at any other nuclear plant, were just loaded this summer? How is it possible to know that the casks will not impact the environment 34 years from now?

Ms. Parkhurst: This is an area that is outside the scope of the license renewal. There is a specific Environmental Impact Study or statement for evaluating that area. This is again, outside our scope of study and I'm wondering if there is?

Mr. Kugler: We do evaluate this one particular issue within the scope, but I believe, Barry, I'm not sure if you have further information. My read on that is that it's not intended to be permanent, but I'd have to go back and look to be certain about that. I think it's saying it's okay to store it until the permanent repository is available, but I would have to go back to confirm that.

Mr. Cameron: We're going to go to Cynthia on that.

Ms. Sochor: That particular clause has to do with after a plant closes down. That does not have to do with the current operation.

Mr. Kugler: But I think here question was, it's not intended to be permanent, forever. The intent is still that there would be another repository at some point.

Ms. Sochor: Yes. That's true.

Mr. Kugler: Okay.

Mr. Cameron: Okay. Thanks, Cynthia. Deborah.

A18 Ms. Sheppard: I have this funny feeling that I'm getting dumber and dumber as this meeting goes on. So please forgive me if what I'm asking should be obvious and I'm not getting it, but it says nuclear fuel is considered in the rule.

Ms. Parkhurst: The management, it's the waste management end of it.

Ms. Sheppard: So it is considered in the rule?

Ms. Parkhurst: The GEIS looks at the fuel cycle and identifies those areas that are relevant here as Category 1 issues. Everything else is outside of the scope of what we are asked to address, as far as the environmental aspects of reviewing the applicant's Environmental Report and writing an Environmental Impact Statement for license renewal.

A19 Ms. Sheppard: Well, is onsite storage of nuclear wastes in the these untested casks going on at other facilities?

Ms. Parkhurst: Untested?

A19 Ms. Sheppard: Well let's delete that word. Is onsite storage of nuclear waste in casks occurring at other facilities?

Ms. Parkhurst: Yes.

Ms. Sheppard: Then is this issue plant-specific or generic?

Ms. Parkhurst: This is a generic issue. Your specific, but there is a specific and separate evaluation of your onsite dry storage cask facility that's separate from what we're evaluating here.

A18 Ms. Sheppard: I'm afraid your regulatory procedures and comments must run opposite on this particular issue because obviously, the nuclear fuel that is sitting at that plant now is part of the fuel cycle, and your observation that it's a small impact, or nonexistent impact is -- I don't even know a word to use to describe it. It's just an observation from the public.

Ms. Parkhurst: Thank you.

Mr. Kugler: I want to try to take a crack at clarifying this though, because I don't want to leave you with the feeling that we're not trying to answer your question.

I think what Mary Ann was saying is that when they established an independent spent-fuel storage facility out there, the dry cask storage facility, that was reviewed as a separate issue to establish it, okay? It's licensed under Part 72, as opposed to being licensed under Part 50. So that action of establishing a storage facility is separate from license renewal.

Under license renewal we do consider the environmental impacts of onsite storage as part of the fuel cycle. So we are considering that, and that's why the issue is described and discussed in our Environmental Impact Statement. So it is considered -- the piece, I guess, that I would say is not considered is the storage of the fuel, eventually in a permanent repository. That is not part of our review.

A18 Ms. Sheppard: The impact of the storage onsite is considered small?

Mr. Kugler: Yes. That's correct.

A18 Ms. Sheppard: How did you make that assessment?

Mr. Kugler: Well, that assessment was made in the Generic Environmental Impact Statement in more detail. In this Environmental Impact Statement what we did, because it was a Category 1 issue, was look to see if there was any new and significant information related to Hatch and its storage of fuel. Since we did not find any, we accepted the conclusions in the Generic Environmental Impact Statement for Hatch.

A20 Ms. Sheppard: Did you evaluate such things as hurricane conditions, flooding, tornadoes, weather-related elements and those kinds of things?

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Mr. Kugler: I would have to go back to the GEIS to tell you exactly everything that was considered, but I'm sure weather was an issue that they considered in evaluating the design of the facility itself. The actual storage facility has to be designed to deal with design-basis conditions including weather at the site. That would also include seismic and things of that nature.

A21 Ms. Sheppard: I have another question. How exactly do you assess the cost for the storage of the spent nuclear fuel onsite and the unknowns regarding the cost of nuclear fuel storage?

Mr. Kugler: If you're talking about the cost to the utility to store it?

Ms. Sheppard: Yes. How do you assess that?

Mr. Kugler: We do not assess that.

A22 Ms. Sheppard: Then how do make a comparison about the alternative sources of energy including conservation that are sufficient? You appear to have under-evaluated without having a mechanism to identify and evaluate the cost of what you do. It appears from your presentation, that you are not evaluating the full cost of continuing the Hatch license and extending it.

Mr. Kugler: That issue would be evaluated by the licensee. Really for us, the cost is not an issue. What we are evaluating are the environmental impacts, and determining whether the environmental impacts of license renewal are significant, or what level they reach, what the environmental impacts of the alternatives would be, and making a call on whether the environmental impacts of the alternatives are greater or lesser than the alternative of license renewal.

In terms of the cost, that call really comes down to the utility. If they find that it is more expensive to run this plant than it would be to implement one of the alternatives, then I would assume that they would pursue the alternatives as being more cost-effective, but that is really not an issue that we are concerned with.

It's sort of like a driver's license in a sense. If we renew the license, we are giving them a license to operate. They can decide not to if they find it's not cost-effective. We are not requiring them to run for another 20 years.

[Discussion]

A23 Ms. Sheppard: The argument falls apart because of the cost of investing in nuclear waste. You are speculating on one side about a situation which is known. You do know how to increase efficiency in energy. You do now have information. You have a lot of information about Hatch, and as far as I know, the real issues are the cost of that. So we've got one alternative that we really do know how to accomplish, but it is perhaps costly. We have another alternative that's continuing to operate nuclear facilities without an end-waste disposal

and we don't know the cost of that. You all are telling us that is the preferred alternative, and I think you're telling me that you don't know the cost associated with that.

Mr. Kugler: Well, I think we do know the cost of storing fuel onsite. I think the licensee could clearly indicate how much it costs them to store onsite, but I understand your point. I think what you're saying is, did we consider the cost associated with onsite storage of this fuel for some period of time which is not specified entirely? In considering that, it might become prohibitive.

[Presentation by Mr. Snodderly]

A24 Mr. Holland: Mike, who does the existing analysis, the one that said that \$500,000 it would be unacceptable to look at beyond that? Who does this analysis?

Mr. SNODDERLY: It's a combination. The regulatory analysis guidelines, and I can give you -- Excuse me. I'll get the reference. This is the Regulatory Analysis Technical Evaluation Handbook; this is NUREG/BR-0184. This is what we, the staff use. Two inputs you use from that are the estimated core damage frequency and averted person REM and frequency.

Now those things are determined by, in our case for Plant Hatch, we used the Plant Hatch Individual Plant Examination and their updated Probabilistic Safety Assessment. We also have done Probabilistic Safety Assessments for plants similar to Plant Hatch, and we compare our results with theirs to make sure we are in the same ballpark; that we didn't miss anything, or they didn't miss anything. So it's a combination of those Probabilistic Safety Assessments feeding in, to make the calculation to determine that \$500,000 number.

A24 Mr. Holland: Okay. I find the idea, I mean, just a mere -- that someone could believe that human lives aren't worth more than \$500,000 is totally unacceptable. It's beyond belief. I can't reason it. I can't believe it. My God, some doctor bills come to almost that much. God, can you all go back and do better than this? I'm just going to -- I can't believe this is the way people think. You've got to do better than this.

Mr. SNODDERLY: I appreciate that, Mr. Holland. Let me see if I can try to give you a greater perspective. I mean, give the perspective of the Commission and how we have tried to relate the risks associated with severe accidents to those that we take in our everyday lives.

What they have tried to do is, through the Severe Accident Policy Statement, they tried to assure that -- the goal is that it be a small fraction, one-tenth of one percent of those risks associated with early fatalities and latent cancers. The modeling that we've done has shown that it is a small fraction at .1 percent.

Mr. Holland: A small fraction. I used to work for an organization that billed the government at the end of every month. To ensure that we got our payment within 10 days, do you know what we put on there? We will give you back one-tenth of one percent. Do you know what? That guaranteed us getting our money.

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Mr. Cameron: Mr. Holland, we're not catching you on the record here. I think that might hurt your point. Are there any other questions on this before we go to the final, or the preliminary conclusion? Yes, Deborah.

A25 Ms. Sheppard: This is just a general question and you all might not be the right people, but I believe I read somewhere that the Southern Company is spending \$14 million to proceed with this re-licensing. If that is correct, can anybody answer that?

Mr. Cameron: I think that, I guess I would -- off-line if the Southern Company wants to talk to you about that information, they can do that, but I don't --

Ms. Sheppard: Okay. I was just curious when your Department quoted that number.

[Presentation by Mr. Kugler]

A26 Ms. Sheppard: Again, I want to make sure I understand the roles that each of you are playing. Everyone but Ms. Parkhurst is a direct employee of the Nuclear Regulatory Commission?

Mr. Kugler: That's correct.

A26 Ms. Sheppard: That's correct. In the case of Ms. Parkhurst, your firm was contracted by the NRC to prepare what portion of this statement?

Ms. Parkhurst: Assist them with the preparation. We were contracted to assist them with the preparation of this document; assist them with the review of the application of the Environmental Report that SNC provided, and assist them with writing the Draft Environmental Impact Statement.

A27 Ms. Sheppard: Okay, so your part in it is the primary outside expertise that has gone into the project?

Ms. Parkhurst: That's correct.

A27 Ms. Sheppard: I would love to know if you would share with us just a couple of your other clients, and I'd also love to know how many people participated in this from your firm and what direct expertise those people have in Southeast watershed hydrology, biology issues.

Ms. Parkhurst: I'm not sure what is appropriate to respond on that. I will mention that everyone from my organization and from NRC who is involved in writing the document is listed in one of the appendices, along with our specialties. We've got a lot of expertise from a lot of widespread areas. That's one reason that the NRC came to us to look into this area.

Mr. Cameron: Does the expertise and all listed in the --

Ms. Parkhurst: There isn't a -- the specific areas that they addressed or evaluated are in one of the appendices along with our names, our organizations, and the areas specifically, that we

were working on in the document is in one of the appendices, I think it's B, Appendix B in the document.

A27 Ms. Sheppard: I'm sure I can find that, but I'm just very curious if you could share with us your knowledge or what specific expertise your team had on Southeastern United States aquatic systems and hydrology and biology.

Mr. Cameron: May I ask you, whatever you know, I think would be appropriate for you to share on that particular issue.

Ms. Parkhurst: I'd rather have -- Barry, please.

Mr. Cameron: Barry.

Mr. Zalcman: Let me try to respond to this. The Agency has a collection of technical specialists on this task and we also contract, and Mary Ann Parkhurst is a representative of Pacific Northwest National Laboratory. We actually have a suite of national laboratories that work with us. It's fundamentally important when we begin the audit process that we bring technical experts that are actually considered experts in the field, but we actually come to the site area and we coordinate and actually have dialogue with those that are specialists in the region, including State representatives on the water side, State and local representatives on the socioeconomic issues so that we have technical expertise. We're talking typically, a national lab employee that at least has a bachelor's degree. Moreover, they can have master's degrees. Some of them have PhD's. The group that we have are typically seasoned individuals that have broad expertise for an extended period of time in the environmental regions. Are they specifically working on a watershed in Hatch vicinity? Absolutely not. Are they technical experts in their field? Typically they are, and if they are not experts they are overseen by experts in the field, but it's with the coordination and the dialogue that we maintain through audit, through this review with the State and local organizations that help us round out what our understanding is of the problems and of the challenges in this area. I hope that explains a little bit. If you'd like, you can provide your CV and John is here if you'd like to your background. You'd have to demonstrate the background that these individuals have to talk to these issues.

Ms. Parkhurst: I can at least mention that. I have an undergraduate degree in chemistry, a Master's in ecology, and a master's in radiological science with many years of project management.

Ms. Sheppard: From what university?

Ms. Parkhurst: Is there a basis for that question?

Ms. Sheppard: Well, yes there is. I mean, you all come from the Pacific Northwest and that's about as far away from this plant as you can get. It's just a common question.

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Ms. Parkhurst: It's not necessarily that we're all from the northwest even though that's the organization.

Ms. Sheppard: Yes. I understand that. You could have a University of Georgia PhD on your staff.

Ms. Parkhurst: One of our ecologists that supervises the rest is a Duke University graduate, PhD graduate in ecology. Again, we try to work in those that have specific area involvement as well, and have done this consistently.

Ms. Sheppard: Okay.

Mr. Cameron: Do you have one more question?

A27 Ms. Sheppard: I'm sorry. I'm not trying to belabor this, but the other clients, if you could just share with us three or four or maybe five of your other clients that would be useful.

Mr. Jaksch: Let me talk to the socioeconomics. I have a PhD and a master's in environmental economics from Oregon State University. I spent about 13 years working for the U.S. EPA in Washington, D.C., most of which my focus was down in this area. So that kind of gives you an idea of some of the capabilities that we have. I'm also with the lab out in the Pacific Northwest.

Ms. Sheppard: Okay. Thank you for that.

Mr. Cameron: Just put your name on the record for us too.

Mr. Jaksch: I'm John Jaksch.

Mr. Cameron: We're going to go to Cynthia.

Ms. Sochor: My name is Cynthia Sochor and I have a BS in mathematics and a BA in political science from the College of Charleston in Charleston, South Carolina, as well as an environmental engineering degree from Clemson University in South Carolina.

Mr. Cameron: Okay. I think we need to get on to the statements. Do you want to state any of your work that has been done on similar areas?

Ms. Parkhurst: Are we talking clients here, or are we talking projects like?

Mr. Cameron: Well, I think that the most important part of it based on what Deborah was saying, was projects that were similar analysis.

Ms. Parkhurst: Similar?

Ms. Sheppard: I'm just trying to understand who your firm primarily worked for.

Ms. Parkhurst: Mostly government agencies. We do private work as well.

Ms. Sheppard: Do you work for any utilities per se?

Ms. Parkhurst: Certainly not in -- I see Barry getting up and I would want him to address that. I shouldn't --

Mr. Cameron: We need to stop this. But this is an important point. Barry could you just address the conflict of interest issue? I think that's what Deborah is getting at, and then let's move on.

Mr. Zalzman: The Agency is very careful in assuring that we do not have a situation where an individual employee would work for a utility on the same type of issue that is actually associated with developing the final information that the Agency would be using. So the reason that we use national laboratories as opposed to private consulting firms that actually do consultations for the industry is to remove any appearance of conflict. Wherever we identify an appearance of conflict we terminate that activity. So we're very careful; very judicious in who does or does not work for or with us.

Mr. Cameron: All right. Thanks, Barry. Deborah, I know you have most of the information you needed there, but right now I'd like to go to the people who have -- we've really appreciated the comments and questions that we've heard already, and I think it provides a lot of useful food for thought at least for us. I'd like to go to the people who wanted to make a more formal statement. And I think it would be appropriate to go to the Southern Company -- they initiated the application for this. So I'm going to ask Mr. Lewis Sumner, who is the vice-president for the Hatch Nuclear Project to start us off. Mr. Sumner, do you want to come down here? Why don't you?

Mr. Sumner: Just a little bit about me before I get started. When the question was asked, have you ever lived around a nuclear power plant and the answer was yes, I was at Plant Hatch for 22 years and I raised a family in this local area here, so I'm as concerned about the effects that Plant Hatch has on the environment as anybody, because it directly affects not only my family when they were here, but also I'm concerned about the long-term effects on my family from what might have happened as long as they were down here in the local area.

I started here in Plant Hatch back in 1975 out of the Georgia Institute of Technology with a Master's degree in nuclear engineering. I started as an entry-level engineer and my last position before I left was the General Manager of the plant. I have held several positions there. So I've had a chance to see the plant from an entry-level position all the way up to managing it before I left.

A28 My comments are like this. Number one, I want to thank the NRC for what I believe is a very
thorough review. It looks like it has been very comprehensive. I think some of the conclusions
A29 that they came to are some of the same conclusions that we came to when we did our review
of the environmental effects of Plant Hatch. We wouldn't be doing this if we didn't feel like as a

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company it was the right thing to do, and I wouldn't be promoting it if I didn't feel like personally it was the right thing to do. Considering all the contributions that Plant Hatch makes not only to the local area, but to the State and local economy and some other security issues I'll mention in the end.

A30 We have been working on this process since around December of '96, so we've been at this for a few years because there is a tremendous amount of work that goes into preparing not only just the environmental review, but the other parts of the license renewal process that you don't see here today. I do believe that the report, the summary of which you've heard today, demonstrates the same conclusions we reached. The impact of renewal is small and certainly acceptable for the renewal period.

The people that operate and maintain Plant Hatch do live in the local area, so the environment that they are affecting is also the environment that they live in. So they try to be good environmental stewards of the very areas that they both live in and recreate in, and their families live in as well.

A31 We are committed to being a good neighbor while we are trying to carry out our mission of generating electrical power for this area of the country. We think we make a major contribution to the local and State economy, as well as to the quality of life in this area by supplying electrical power to power the things that we have become accustomed to. You know, the lights in this room that extend our usefulness and our ability to get things done to the computers we use here to connect ourselves to the outside world and make us more efficient, as well as simple things such as the heating and cooling that make cold nights bearable and very hot days bearable also. So we think we have a mission that does promote, you know, a quality of life improvement here.

I want to thank the neighbors that have continued to support us. We certainly do have an impact on the local economy, on the environment, and on the local area as far as organizations and things that our people not only that work at the plant participate in, but also work toward to help make the local community better.

A32 Like I said earlier, we are continuing to work hard to be good environmental stewards and be a significant contributor to the local area. I personally also believe that we promote the security of reliable electrical power in this country by being an alternative means of generating electricity. Some others were mentioned up there earlier today, and I think if you read in the newspaper about some of the issues that are going on in other states about the reliability of alternative means of generating electricity, you don't see those issues related to our particular form of generating power. So I think we are a viable and valuable contributor to the energy security mix of the United States.

I believe that this is the right thing to do for us. I think it's the right thing to do for the local area.

I appreciate the review that the NRC has done and I believe that we will demonstrate as time goes on that we are good environmental stewards of our facility, of the environment, and this is the right thing to do for us. Thank you.

Mr. Cameron: Okay. Thank you, Mr. Sumner.

We have two local government officials here, I believe that we'd like to hear from, and then I'd like to go to Sarah Barczak from Georgians For Clean Energy, and then we have one other speaker. Steve Rigdon, from the City of Baxley. I believe the Mayor?

Mr. Rigdon: Yes.

Mr. Cameron: Mayor Rigdon, okay.

Mr. Rigdon: My name is Steve Rigdon. I am the Mayor of Baxley. I was in this room in May when we had one of the hearings, and at that time I spoke in favor of renewing the licenses.

As I said at that time, I was not a technical person. I didn't understand some of the technical terminology that was used that day, nor could I speak in a lot of the technical terms, but I've lived around Plant Hatch ever since it started. I've raised my family here. I've got a lot of friends that work there.

I have the utmost respect for the personnel that work there. They have the highest integrity and are very concerned about environmental issues and all the issues that were discussed here today, they are very concerned with.

I have followed their safety record on a local level and I know that they have a lot of checks and balances that they have to check every day, and I feel comfortable with those.

A34 After having seen the review today and having read some of it myself, I am more comfortable today than even in May, that the renewing of the license process is the thing to do. I very much appreciate the work that went into it. I had no idea all of the research, the verification, and all that went into the process for the re-licensing.

I am comfortable with the level of work that was done and I'm here to say that Plant Hatch has been good for our community. They are good neighbors. They are very responsive, and I continue my support of Plant Hatch, as well as recommending to the NRC that they continue with the re-licensing process. Thank you.

Mr. Cameron: Okay. Thank you, Mayor Rigdon.

Let's go to Mr. Jeff Baxley, of the City of Baxley.

Mr. Baxley: Thank you, Chip. I'm Jeff Baxley. I'm the City Manager of the City of Baxley.

A35 I probably should have come down with our mayor and stood behind him and just nodded as most good city managers probably should do, because what I have to say basically echoes what he said. I too was here last May to lend my support for this re-licensing effort, and I'm here again today for that same reason.

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I would like to commend the NRC for the in-depth process in looking into this re-licensing issue with the environmental impact. As I mentioned in May, I certainly trust the rules and regulations the NRC set forth, but I guess more importantly, because I do live in Appling County and in Baxley, and was born and raised there and have lived there since 1956, I have all the confidence in the world that the people that work at Plant Hatch will be sure that these rules are implemented, and provide a safe place for my family as well as their families.

I think there are about 800 employees at Plant Hatch. About 300 of those live in Baxley and Appling County. I probably know, I would say 80 percent of those employees on a first-name basis. I can assure you that they would not do anything to jeopardize their family or their friends, or certainly the environment. Many of them enjoy -- I heard others comment on some of their concerns and I share those concerns. I share them for the same reasons you do. I don't live on the river. I live about 10 miles from it, but I enjoy going to it almost every weekend to hunt and fish, and I would not be in favor of anything that would damage that. It is a wonderful resource and it's a place that I thoroughly enjoy. I want my kids and my grandkids to be able to enjoy that resource.

A36 I do stand before you today in support of the re-licensing of Plant Hatch. The economic reasons as Mr. Sumner has already mentioned are obvious to us, but I think it is important. I am very pleased with the findings of NRC in their report today, and the fact that the option for re-licensing is considered reasonable. Thank you.

Mr. Cameron: Okay. Thank you, Mr. Baxley.

Let's now go to Sarah Barczak from Georgians For Clean Energy.

Ms. Barczak: Hello everybody. Can everybody hear me? My name is Sara Barczak. I have been working with Georgians for Clean Energy for about a year. We are a nonprofit conservation and energy consumer organization that has been working to promote safe and environmentally sound energy policies for Georgia, for almost two decades. My primary expertise is in biology, and I work in our Savannah field office.

A37 My organization has submitted written comments and presented oral comments at public meetings, etcetera, since the Hatch re-licensing process began. While I myself was not here in May, I did help put together the written comments that we submitted in June. I did read through all of the oral comments from the two meetings that were held back in May and I was very amazed, and struck may be the best word, by the fact that very few people actually spoke about the scope of what the NRC had requested, namely, the environmental impacts of Plant Hatch. From those notes and also from what was said today, Mr. Cameron, who is was Facilitator back in May and now again today, had stressed that the purpose of the NRC being here is to gain insights on the environmental issues related to the Hatch license renewal application. As I said, almost everyone spoke about how wonderful nuclear plant Hatch is for the economy and how Hatch has been such a good neighbor because it provides such a large percentage of Appling County's tax base, 68 percent in 1998 alone, and they don't know where they'd be without Plant Hatch. Yet economic studies in the Savannah River site region have

shown that it isn't healthy for a region's economy to have a nuclear industry contributor that provides even as high as 4 percent of the local tax base. Such reliance is not healthy.

My organization is very concerned that the community is focusing almost entirely on perceived economic benefits and is overlooking the environmental impacts, along with the long-term economic growth implications, including the possibility that there could be a meltdown and catastrophic consequences to the local resources here.

I was struck by the fact that the sheriff of Appling County didn't talk about emergency planning concerns, security issues, and terrorists threats, but rather on how great the plant was or is.

People often spend a lot of time explaining where they are from which is very important. The highest vulnerability from the plant is within this local area. I am from Savannah, and we are also vulnerable in terms of an accident. I do care about what happens here. I am concerned about this region, its people and land, and I do lay awake at night thinking about members that we have in this region and all of you. I want to stress that it isn't a job so to speak, it is a genuine concern that I have for you and this region.

A40 Georgians for Clean Energy is here to tell the NRC that this nuclear plant should not be re-licensed for a variety of reasons, but as I said earlier, we are to speak about the environmental impacts of the Generic Environmental Impact Statement, Supplement 4, so I will speak about those.

A41 We would like to state publicly that Georgians for Clean Energy does not believe that our written comments or our oral comments that we presented, and other organizations presented have really been looked at.

A42 I probably didn't make myself clear in some of my questions, that it is hard to look at this GEIS and figure out, you know, was my concern addressed, or was the Altamaha Riverkeepers concern addressed? What were their concerns? What were other people writing in about? I didn't have the ability to find that very easily, and yes, now we know we can go through the Public Document Room, but that is a feat in itself. I have done that, but it's not easy.

A43 We sent additional written comments to supplement our previous oral statements and thought that those efforts which were very time-consuming were for naught. All statements submitted either in written form or orally should have been included in the Draft EIS as I had suggested earlier. Valid and strong statements of environmental concern were made and were supported by a multitude of documents that the NRC needs to pay attention to, and we are disappointed that the first team of reviewers did not.

A44 So as a request to the panel that we have before us, we request that this panel reevaluate all of the oral and written comments concerning environmental issues that were previously presented to the NRC during the Environmental Impact Statement process.

A45 Specifically, we take issue with Appendix D, "Organizations Contacted." Not one
A91 non-governmental, environmental, or conservation organization was contacted. It appears that

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in this Environmental Impact Statement, effort was put forth to contact Realtors, but not one group 17 that focused on the environment, health issues, or conservation issues. The State of Georgia agencies that were contacted do not have expertise in radiation and its effect on species as a whole, and the ecology of the region.

The drought issue was commented on earlier as well, but I'd like to highlight this. Everyone here knows that we've been experiencing a very tenacious drought, and that water issues are in the forefront of many people's minds including our Governor. The Altamaha River is very important as we all know, to this region for the wildlife, commercial fishermen, recreational enthusiasts, and more. Plant Hatch has to rely on water resources too, and it relies on them to an alarming degree.

According to the licensee, Hatch is permitted to withdraw a monthly average of 72 million gallons of water per day, with a maximum 24-hour rate of up to 104 million gallons per day from the Altamaha. Hatch's average is about 57 million gallons per day, with 25 million gallons returned to the river. So overall, on average Hatch consumes about 33 million gallons of water per day. That is impacting the river flow. That is a problem under severe drought conditions and could alter river habitat in unexpected ways.

Furthermore, we should not forget, and I hold this dear to my heart because of where I'm living in Savannah, we should not forget that Hatch is permitted to use a monthly average of 1.1 million gallons of water per day from the Floridian aquifer. We have our own issues with that in Savannah, with the dredging and everything else. That's what they are permitted to use. Their average is less than that, but that is what they are permitted to use.

- A46 When this plant was licensed, the severe concerns over our water resources did not exist. We weren't in drought conditions. We are now. These permits and conditions need to be reevaluated based on current laws and regulations. If this were a new nuclear plant that they were trying to license, they would need to comply with all current State and Federal water usage and pollution-control standards. This license application renewal should be viewed in the same light. I know it's not, but that's what we feel that it should be. Yet according to this
- A47 Draft GEIS, license renewal will not have an adverse impact on the Altamaha ecosystem. We challenge that determination. I am hurrying here, so bear with me.
- A48 Since Hatch was built, the Southeast has entered a period where we have had more severe droughts. We do not believe that the NRC has conducted a thorough and site-specific investigation of this issue. At the very least, the NRC needs to more accurately determine how Hatch impacts the region during extended drought periods. A consumptive loss of 3.1 percent during minimum discharge periods is not insignificant and certainly needs to be researched further. For instance, how does the NRC know whether or not the drought and the strain that Hatch places upon the river's flow during a drought, doesn't increase the stress on the already endangered Short-nosed Sturgeon to a level that the species can no longer handle?

Many of the reports that were referenced in the Short-nosed Sturgeon section of this Draft GEIS, were based on studies that were done in the 1970's and 1980's. So conditions have changed and I think they need to be reevaluated.

- A94 Additionally, the GEIS didn't address concerns around discharge temperatures at the point it enters the river or within the mixing box. I did mention this earlier in a question, but I'll rephrase it. A maximum discharge temperature in the mixing box, which is reported to the EPD quarterly, was 94 degrees Fahrenheit in the summer. Does that effect the river more so during periods of drought, in which fish and plants, etcetera, are already stressed? What is the temperature at the discharge pipe on a daily basis? If that is not being measured, why not? These studies need to be done before a license extension can be granted.

Additionally, why hasn't the EIS addressed additional water quality concerns regarding the release of radioactive contaminants to the environment? We will identify further water quality concerns in our written comments, so look in the appendix next time and maybe you can read them.

- A49 Though many people at the first hearing seemed convinced that nuclear power does not release emissions into the environment, I would like to point out that radioactive water vapor is lost to the atmosphere every day. It is a fact of nuclear power plant operation. In Hatch's case, as I said earlier, an average of 33 million of gallons of water per day is lost, primarily in the form of radioactive water and radioactive water vapor. It is unfair and misleading to the communities to be told otherwise.

- A50 Through the water cycle, the contaminated vapor is often deposited in the form of precipitation. This precipitation then makes its way into our rivers and onto the grass that our cows eat, and
A51 through the ingestion pathways, eventually to the milk in our coffee. State EPD Reports show that measurable levels of man-made radioactive contaminants are found in vegetation samples, and there are a number of rare and threatened species that are sampled and do show these levels.

- A52 How can the NRC determine that a license extension of Plant Hatch will not add to the stress of the many rare and threatened plant species in this area? Especially when many plants species are already undergoing stress under drought conditions, along with continuous contamination from the Hatch facility. It is an established scientific fact, that radioactive contaminants bioaccumulate up the food chain. There are of course, regulatory limits, but let's remember that these limits were not set with the health effects of low-level radiation exposure in mind. The limits are generally set to allow industry to operate. That's just kind of the way it is. It's not any comment on anyone in this room.

Studies on the effects of tritium, which is essentially radioactive hydrogen, a primarily man-made radioactive element produced during nuclear reactor operation, have found that it easily crosses the placenta and may have the greatest impact on the developing fetus. As water, tritium can easily enter our cells. Yet our drinking water standards base the tritium limits on the average-sized man. Cesium-137, which is also a man-made radioactive contaminant and gamma emitter, has been measured in fish, shrimp, and crab samples as far down as Wolf Island.

As Mary Ann said earlier, when she referred to seafood and said -- I'm paraphrasing here -- seafood as in shrimp and things like that, that really struck me that there is a bi-annual report

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that the EPD does, where they collect shrimp, and mussels and fish, and all kinds of things and it's in there. It's in the meat of the fish. Some of it's in the bones of the fish and they are not at levels that should necessarily send up a red flag, but they are there and they are very far away.

A53 Cesium-137 mimics potassium and collects in the muscles and Strontium-90 mimics calcium and collects in our bones. It is a fact that the decay products coming off of nuclear plants, whether it is through the stack or directly into the water, generates Cesium-137 and Strontium-90. The effects for instance, of Strontium-90 leads to many types of bone cancers. The elderly, children, and people with immune disorders are most susceptible to the effects of ionizing radiation.

A54 At the meetings last May, people spoke about how the fish still taste good, maybe even better. Radioactive contamination is the most insidious form of pollution perhaps because it is the most sly. We can't see it, taste it, or smell it, so it's hard for people, including our regulatory agencies, including myself to understand it. The fish won't taste different. They'll just have stuff in them that may be affecting them and their offspring just as it may eventually affect you and yours.

Now I'm going to wrap up. Back to the economics that people love to talk about. Plant Hatch is alongside the Altamaha River, Georgia's largest waterway, near prime agricultural areas and

A55 is two counties upstream from Georgia's beautiful Golden Isles. The interests of South Georgia's communities and the thousands of nature-based jobs that support at least one-fifth of our region's economy are impacted by the NRC's decision to re-license this aging nuclear plant. Georgians For Clean Energy demands that the NRC conduct proper, site-specific
A56 evaluations of the actual 24 impacts of Plant Hatch on this region. Past plant operations, accidents, spills, worker contaminations, and routine releases have to be considered which are already listed on the NRC's own docket and have obviously gone unread.

I'm not going to go through this list, but I had a brief list of Licensee Event Reports that happened the last week of August to the first week of September. Maybe I'll just submit this to Chip, but we had one on the 31st, the 4th, the 8th, the 11th, the 20th, the 25th, the 27th, and the 29th. Those aren't all that's required to be reported, and they are not necessarily all serious events, but some of them were and they need to be looked at.

A57 Simply stated, the plant is aging as we are all aging, and there's no excuse for an unauthorized person to enter the plant. That was one of the things that had happened. The NRC needs to read the entire docket, which wouldn't be very fun at all. Every violation, every LER, everything going back to start-up. No one would allow this plant to be re-licensed if they sat down and read the entire docket.

A58 Please include in the EIS review, new problems or incidences and indicators of problems at Hatch that have developed in the past few months. We strongly believe, given the extensive documentation that we have collected, that if a proper analysis were done, the NRC would have no other choice but to deny Plant Hatch's license renewal application.

If this license renewal application goes through, there will be many heavy stones left unturned. Unfortunately, the health of this community and surrounding regions is what we stand to lose and we can't afford that, nor do we accept that. Thank you.

Mr. Cameron: Okay. Thank you, Sarah. If you have a copy of that we could attach that to the record. All right. Our last speaker tonight, is it Dusty Gres? All right, Dusty.

Ms. Gres: My name is Dusty Gres. I am the director of the Regional Library System, which covers the areas of Toombs, Tattnall, and Montgomery Counties, all of which border the Altamaha River. I also live on the Altamaha River, and since I don't see any of my neighbors here, I live closer to the plant than anybody in this room. I live three miles west on the Altamaha upstream.

A59 I appreciate all of the information that is in the draft document. I can tell you that after working in the government documents business for 25 years, trying to help the public read and understand city, county, State, and Federal documents, this one ain't bad.

A60 I would like to see more in the appendix in the initial draft document, and I do point out to the NRC the efficacy of indexing, which you don't do yet. As a draft document it contains a great deal of information.

A61 I am gravely concerned about the environmental impact, and I am gravely concerned about the fact that many of the tests were done earlier and have not taken into account certain environmental issues, particularly the drought.

When you look for instance, at the temperature of the water as it's going in, I happen to know what the temperature of the water was when it was coming out and we are not dealing with the fact that the water that's coming in has risen in temperature a great deal. Given the fact that -- Do you want to say that I am impacted because of the economic issues? Yes, because my patrons live in this area, but I don't get tax money from the plant.

A62 I will say that I am in favor of the renewal. I am in favor of the renewal because I've lived next to a coal-fired plant. I've had a library next to a railroad track where coal trucks went by and I know that there are environmental impact issues that are greater in different kinds of plants.

A63 So I support this. I support it because I canoe down that river, I swim in that river, and I eat the fish out of that river, but I have seen that there is not a great deal of environmental impact right now and I can name at least 30 different plants and animals that are either rare or close the
A61 endangered list, that I personally have identified on that property, that are growing. So I continue to support it in those terms, with the caveat that I believe that better testing needs to be done.

A64 I also formally request the NRC, that since the counties that I represent in my public library are more counties than just Appling, that all documents be deposited in my library as well, because I have more of an impact than Appling County does since I have more counties that are within that service area.

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Transcript of the Evening Public Meeting on December 12, 2000, in Vidalia, Georgia

[Introduction by Mr. Cameron]
[Presentation by Ms. Carpenter]
[Presentation by Mr. Burton]
[Presentation by Mr. Kugler]
[Presentation by Ms. Parkhurst]

A65 Ms. Ray: Thank you, Chip. What do you mean by refurbishment?

Mr. Kugler: Okay. In this context, what we're talking about is activities beyond just the normal ongoing refurbishment activities that are going on in a plant every day. In other words, these plants are always working on their equipment, upgrading it, and maintaining it, but that's not what we're talking about here. We're talking about activities that are above and beyond the normal activities that are done every day at the plant.

An example might be something like the replacement of a steam generator in a pressurized water reactor. Something that could have environmental impacts outside the plant. So it's not just the day-to-day type work that's done. I mean, they have re-fueling outages every 18 months at each of these units and there's always activities going on in those outages. We're not including that. Does that make sense?

A66 Ms. Ray: Didn't you say that was an issue that wasn't applicable to Plant Hatch, so you didn't look at it?

Mr. Kugler: In other words, what they indicated in their application is that they have no plans for major refurbishment activities in the license renewal period. They are not planning to do anything beyond the normal activities that go on. Does that make sense?

Ms. Ray: Yes. It makes sense. It's just odd.

Mr. Cameron: Okay. Janisse, do you have any other questions on this at this point?

Ms. Ray: This is different. Human Health is one of the issues that you looked at. Right? I didn't see it up here, but I do see it here. I want to know what you looked at to determine whatever you found out about human health.

[Presentation by Ms. Parkhurst]

A68 Ms. Ray: The question is a little more generic. That is the use of your scale for judging. You say the impacts are small, but I haven't seen anything come up that says that such and such a percent falls under small, and such and such a percent falls under large. So all we can do is take your word that in a generic sense the impacts are small. Do you see what I'm saying? We have no real data.

Ms. Parkhurst: Well, let me just -- there's just one thing that came out of the most recent study, the 1999 Monitoring Report on doses from the plant. What they determined was that the estimated whole body doses to the most limiting member of the public was about 0.064 millirem per year based upon vegetation, fish, and sediment. Now that 0.064 millirem per year, if you want a comparison, the normal radiation in our environment from background radiation, runs 300-360 millirem per year for most areas of the country. That equates to about one millirem a day. The amount they calculated here on a yearly basis from vegetation, fish, and sediment was about 0.064 millirem per year.

The amount from gaseous and liquid effluent releases is about 0.074 millirem per year. Again, relate that to one millirem a day that we're getting from natural sources.

A69 Ms. Ray: I'm familiar with Plant Hatch and I understand the dosage -- that the radiation would follow. I understand that dosage information. However, I will say that there have been no epidemiological studies at all about what the health effects within the population surrounding the plant -- within 10 miles or 15 miles -- there have been none. I know that it's not required by the Nuclear Regulatory Commission, but I live here.

There's one report where 12 reactors were closed between '87 and '98, and five of those were 70 miles from another nuclear plant. The infant mortality rates in those places fell 15-20 percent. I'm going to give you one other statistic. Calvert Cliffs, since 1990 the death rate of older children has risen and cancer deaths have tripled.

A70 So all I'm saying is that I know the statistics in terms of something measuring dosage, but we have no real information about health effects in our community. I know you're not required to do that and I'll forever be appalled at that.

Mr. Kugler: Well, there's another report that -

Ms. Parkhurst: I don't know. Do we want to further discuss this issue at this moment? I am aware of the report -- of the documents you're talking about. One of the problems with epidemiological studies in general and specifically with something like radiation from plants, or radioactivity from plants and so on, is it's very difficult. It's easy to make associations, correlations with one thing to another, whether it's positive or negative or whatever. It's very difficult to get into cause and effect. This is one of the problems that makes it especially difficult to try to do this on a plant-specific basis. Especially when you don't have enough numbers that would give you statistical quantities to work with, enough quantities. Now, I think really, that's all I've got to say on it right now. Andy, did you want to add anything at this point? Okay.

Mr. Cameron: All right. Janisse, do you have a follow-up?

A71 Ms. Ray: It's not a question, but one idea is to look at cancer rates in a 10-mile radius, and then look at 10 miles somewhere else in the coastal plains of Georgia where there is no nuclear plant. Look at cancer rates before the nuclear plant came and then look at them now. Look at them among children, older people, and not just cancer, but other conditions.

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Ms. Parkhurst: Those are good statistical strategies in doing this. Again, one of the difficulties is there is so much that has changed in our environments over a lot of these same years that it's very difficult to tie them into any specific thing. Also, with people moving in and out it's a very difficult process and an expensive one as well -- difficult to do like this, but I appreciate your comment and I understand your concern.

Mr. Cameron: Okay. Anybody else in the audience have questions on radiological impacts while we're here? Mary Ann also went through water quantity, water quality, endangered species, and all of those specific types of impacts. I guess I would ask if there is anyone who has any questions on those before she goes on? Janisse, anything?

Ms. Ray: Does she want to reply to what small means?

Mr. Cameron: Okay. Can you talk a little bit about the use of the term small? I think you might have defined that, but maybe you can explain it a little bit more.

Ms. Parkhurst: I'll mention it again. This is the terminology from the GEIS. Small means the affects are not detectable or are too small to destabilize or noticeably alter any important attributes of the resource. Okay?

A72 Mr. Person: My name is Jeff Person. I was just wondering what the actual scale was.

Ms. Parkhurst: The moderate impact is one that is sufficient to alter noticeably, but not destabilize important attributes of a resource. A large impact has an effect that is clearly noticeable and is sufficient to destabilize important attributes of a resource.

Mr. Cameron: Mary Ann, I don't know if you can do this, but is there a hypothetical example that you could use that would tell people more graphically perhaps, what a small impact versus a moderate impact, versus a large impact would be?

Ms. Parkhurst: That sounds like a question for the NRC rather than me specifically to answer. It's their definition that we're using as the scale. Is there somebody -- would you care to answer?

Mr. Cameron: Andy, do you know where I'm trying to go with this? I don't know if you could do it, but it might help people understand the difference between small, moderate, and large.

Mr. Kugler: I'm not sure if I can do it off the cuff either, but I'll give it a shot.

Small is probably the easiest because we deal with a lot of those. An example would probably one that Mary Ann has discussed, which is the effects on the fish due entrainment and impingement in the in-take structure.

What we found is that the rate of impingement and entrainment is very small, and that the numbers of fish therefore, that were being entrained and killed were very small and were not

enough that you would really even be able to tell that it was happening in terms of the population of fish out in the river. You'd never see it. So that would be small. Those are easy.

Large may be relatively easy as well. I guess when we start talking about alternatives, we'll talk about the possibility for replacement power of building a new plant at a new site. Well, to do that you're going to level a number of acres of trees, you'll be drawing water off in a new location. If you're using coal, you'll be dumping all the results of the coal burning into the atmosphere and you'll have your ash piles and all that. All of those things generally, will fall into the large category because you actually have a significant impact upon the resource in that area. I mean, you've taken out all those trees. Moderate, I guess I'd have to say just falls somewhere in between there. Perhaps an example might be building a gas-fired plant in place of Hatch, on the Hatch site and using the cooling water system that already exists.

You will have to clear some more land for that, but not a large amount of land. You will be dumping some gases into the atmosphere from the burning process, but not as significantly as you would be in a coal-burning process. So that would fall somewhere in between.

It's kind of a rough thing to try to give you an idea of what we mean by those.

Mr. Cameron: I believe Mary Ann is going to get into -- when she's looking at alternatives -- she's going to talk about small, moderate, and large, and that will be a further explanation. I don't know if that's helpful to all of you, but any other questions on the specific impacts before we go on to alternatives?

A73 Ms. Ray: Andy, this may be for you. For the freshwater mussels, how would you do a study? How does the Department of Natural Resources and others look at that? I mean, did you study population sizes upriver, downriver? How would that have been done? For the Short-Nosed Sturgeon, my question is how can you say that there is no impact to the Short-Nosed Sturgeon or the freshwater mussel? How would you know?

Mr. Kugler: Okay. I think this is a basic explanation of the methodology of how these types of studies are done to get a result.

Ms. Parkhurst: First, let me mention that we have an aquatic ecologist on our team who got snowed-in at Detroit. He was supposed to be here tonight, and could have answered that much better than we can, but we have enough understanding of the process and in particular with the Sturgeon, that perhaps we can, you know, give you a crack at the answer. Again, we have been through the process and our aquatic ecologist can respond to this in the final document.

Mr. Kugler: Okay. We submitted a biological assessment to the National Marine Fisheries Service where we took a look at what we considered would be the potential effects on the Short-Nosed Sturgeon. I'm trying to recall some of the details of that. This isn't something I worked on directly.

Appendix A

I know some of the things we looked at for instance, is that the areas that they tend to exist in the river -- they aren't really seen around the plant that much, but there are certain areas that they go to. They spend most of the summer, I believe, down toward the area where there's an interface between the ocean and the river. As winter comes on, they don't like the cold water very much and they tend to go into certain locations -- deep holes mostly in the riverbed, where they can basically stay quiet most of the winter. They don't move around much in the winter. They don't eat a lot in the winter.

What we found was that these areas that they appeared to go to, based upon information that was gathered from various sources, don't exist right around the plant. It also isn't an area where they tend to spawn. They tend to spawn further upriver, I believe. So based on that information and the fact that the effects of the plant on the river itself are very localized in terms of temperature, that was really mostly the basis, I believe, for our conclusion in our biological assessment. The details are in that assessment, which is included as Appendix E, I believe, or part of Appendix E in the draft. So you can take a look at that as well. It has more detail.

[Presentation by Ms. Parkhurst]

[Presentation by Mr. Snodderly]

A75 Ms. Ray: Will there be some periodic looking at this [*Probabilistic Safety Assessment results*]?

Mr. Snodderly: Yes.

A76 Ms. Ray: Some of this stuff looks like it could be important and I don't know exactly how you would get a figure for total benefit of all of this. For example, providing reliable to the fans. So are you going to revisit it after another two years or whatever?

Mr. Snodderly: Well, let me -- let's say -- First of all, you have to understand that there are already three or maybe even four ways to presently provide power to that -- Which example were you talking about?

Ms. Ray: It's the second one on that list.

Mr. Snodderly: Yes. There's already, I think, four ways to provide the power to the fans. Now we're talking about adding a fifth way. So you can see at some point, there is a point of diminishing return, and what we're doing is making sure that those four result -- they give us that core damage frequency that is low enough relative to again, the safety goals that the Commission has established. The goal is for core damage frequency of one in every 10,000 years. So that's 10^{-4} frequency, and Plant Hatch is at 1.6 times 10^{-5} , which is considerably below that. So that's another reason why we didn't expect to find any cost-beneficial alternatives, but we wanted to take a look to make sure.

Now the other point I wanted to make to you. The Probabilistic Safety Assessment is -- even though this report is going to become final -- the Probabilistic Safety Assessment has become

a very important tool to the Commission and also I believe, to the utility. It's a living document because as the plant operates, you get more and more reliability data and you may find that some things that -- as a matter of fact, things that used to be very important to the plant because they were looked at more closely, say emergency diesel generator reliability, at one time we realized that was a problem, or that's where improvements could be made. That's where a lot of the risk at the plant was.

So by improving the reliability of that component, that risk went way down, but then something else relative kind of pops up. So the Probabilistic Safety Assessment is a living document. It is a thing that is going to be constantly changing and giving us insights to improve our resources and how we look at the plant, and also how Plant Hatch decides on where it is going to put its resources, and what are the most important parts of the plant to look at and improve? So it's been a very good tool for us and one that we're going to continue to develop and improve.

Mr. Cameron: Okay.

A77 Ms. Ray: I don't want to take up all the time, but what you're saying to me is, you know Hatch has a history of accidents including this past year. Are you saying that all those things have been looked at and they are among the 22 different things that misfired or did not work? Those things have been fixed? Is that what you're saying?

Mr. Snodderly: Well, I'm saying -- I can't -- Well, the 22 things that we've talked about were possible plant improvements that should be considered. When Plant Hatch considered those improvements and the cost of them, they said that makes sense and they implemented those improvements. Now those aren't linked specifically to an accident per se.

In other words, it would be something like more of a physical plant change. Something that you're changing to the plant. To put in an improved, a more highly-reliable pump and that's how you then reduce the core damage frequency and the possibility of that particular accident group.

Mr. Cameron: Andy, are you going to perhaps put that in perspective a little bit for us?

Mr. Kugler: Okay. I'd like to say. Where you have operational events that are reported, those issues may or may not be that significant in terms of risk. Our reporting requirements are fairly stringent, so something may show up there that, while it's reportable to us, does not really show up in risk space. So the improvements that we're talking about may have nothing to do with some of those things that have been reported. On the other hand, they may, but in general, what we're saying is that where they found that improvements would be cost beneficial, they've already implemented those.

When they did this review they went back and looked again, and we looked at it and found that there were no additional improvements that would significantly reduce risk enough to be cost beneficial. Operational events will continue to occur. Individual components may fail, but the plant is designed to survive events with the failure of active components. If something fails,

Appendix A

we've built that into the plant. That's why there is so much equipment there. There is a lot of redundant equipment.

Mr. Cameron: Those operational events are not accidents.

Mr. Snodderly: But those operational events are considered as part of the significance determination process, which does use the Probabilistic Safety Assessment to determine the significance of that event. So some events may not be -- that's where you put it in to see how close you came to core damage. In general, I'm not aware of any event at Plant Hatch in the last year that wasn't evaluated as part of that process and determined not to have a significant increase.

[Presentation by Mr. Kugler]

A79 Ms. Ray: I just have two statements to make while I'm at it. One is I think that you guys are the energy-planning decision makers and that we should be really honest here and say that you're doing it for a corporation.

A80 The other thing that -- I've forgotten it. Oh, I want to ask you, what is the possibility, and I'm asking you to be honest -- What is the possibility for Southern Company saying, okay, this is not economically feasible? I know you can't really say, but I'm asking you to be as honest as you can in public.

Mr. Kugler: Well, I guess what I'd say is that the best I could determine is that it would be unlikely. When you have a plant that has been built and in this period I would assume it's paid for, the odds of some other option being more cost effective are pretty small. I'm not going to say it couldn't happen and therefore, all we're really saying is if we grant the renewed license, you have our permission -- assuming you continue to meet all the regulations -- you have our permission to continue to operate for this additional period.

The decision to actually run the plant is an economic one, and that's not our call. We only decide whether it's safe and environmentally acceptable, but we don't determine whether it's economically the best decision. That's up to others. So that's what I'm trying to say I guess. The economic decision is not our call.

[Discussion]

Mr. Sumner: Thank you, Chip. Let me make a comment that I worked at Plant Hatch for about 22 years. I came in as an entry-level engineer. I have a master's degree in nuclear engineering and a bachelor's degree in mechanical engineering from Georgia Tech. My final position before I left the plant was Plant Manager. So I've held various positions there and have a pretty good understanding of how the plant operates, being also licensed at the plant for 10 years while I was there.

The first thing I'd like to do is thank the NRC for their review. I think their review has been very comprehensive. I think the conclusions that have been arrived at, at least of a preliminary

nature, match up pretty well with what we found when we did our review. If you look at the impact on the environment that Plant Hatch has, it's pretty benign compared to what you would find for maybe other sources of generating electricity.

A81 I also want to thank them for clarifying a couple of points. At least one was made in this session. That is, we have a pretty, I guess, agreed upon definition of what an accident is. There have been no accidents at Plant Hatch. We do have operational events and every plant has operational events. There are ways that you report those and we have requirements that we notify the NRC on those particular operational events.

A82 There was also a statement made in the previous session that alluded to some radioactive water vapor that we give off. I think that's a technical misunderstanding of the way the cooling towers work, and the circulating water system works. We don't release radioactive water vapor. I just think that needs to be clarified here. That's really a technical misunderstanding of how the plant operates.

We wouldn't be moving forward with this unless we felt like it was the right thing to do for a lot of reasons. We have been working on this particular project since around December of '96, and we've put a lot of effort into evaluating whether this was the right thing to do for the Southern Company, for the State of Georgia, and for the nation. I think the report demonstrates the same conclusions that we have reached, and that is that the effects of the plant on the local environment are pretty reasonable.

The people that operate and maintain Plant Hatch also live in this area. So the environment that is being influenced by the operation of Plant Hatch is the same environment that these people raise their families in, that I raised mine in when I was here, and that they recreate in -- the local area around here. So the environment that this report is reporting on that shows what the effects are is the same environment that the people that operate the plant also live in.

We are committed to being a good neighbor while we carry out our mission of generating electricity. We believe we are a major contributor to the local and the State economy, as well as to the quality of life by supplying electrical energy to power those things that we have become very accustomed to, like the lights that are on making this meeting possible as we sit here right now, computers that connect us to the outside world through the Internet, and allow us to be more productive and do some of the things, and some of the analysis and evaluations that couldn't be done any other way without the use of computers. Also for such things as keeping us warm when it's cold outside, and keeping us cool when it's hot outside. So we think we provide a very valuable commodity here for the local area and for the State.

I want to thank the neighbors that we serve that have gladly supported us also in the various endeavors that we've had to be a part of the local environment. We continue to work very hard to be good environmental stewards and we continue to be, we believe, a significant contributor to the prosperity of the local economy.

We also believe that we promote the security of reliable electrical power by being an alternative means of generating electrical power for this area. Demand for electrical energy

Appendix A

continues to be strong in this area of the country. We need to continue to meet this in order to sustain the economic growth and maintain the electrical grid security.

Each means that you may pick to generate electrical power is going to bring with it its own unique set of environmental issues. I don't foresee that there is going to be a decreasing demand for electricity during the period of time that's going to be bounded by the renewed license period from Plant Hatch. So that electricity is either going to come from Plant Hatch or from some other source out there. We've got 25 years of experience with operating the plant and I believe we fully understand what the environmental impact is of the plant based on that and the studies that we've done.

A83 I think the plant will continue to operate in the same manner in the renewal period as it has over the last 25 years. I believe its impact on the environment will not be measurably different from what we've already experienced. So I believe that renewing the license of Plant Hatch for another 20 years is the best solution for meeting the future electrical energy needs of this area of the country. Thank you.

Mr. Cameron: Thank you very much, Mr. Sumner. Next let's go to, is it Otha -- Otha Dixon?

Mr. Dixon: Yes. I can only speak about Plant Hatch from layman's terms. I'm a business man here in town at the Holiday Inn Express, but I do want to tell you that I moved here in 1969 to help build Plant Hatch. I was working indirectly with Georgia Power at that time.

A84 I'd just like to say first off, the guidelines imposed on us while building Plant Hatch were guidelines that I'd never seen in construction. I never thought we'd get the plant built under such strict guidelines and the ways we had to build the plant, but I feel very comfortable about how the plant was built. I think it's sound. I think it's as safe as anything I've ever seen. I've never seen anything that was built even close to that in the fossil fuel business anywhere else.

A85 After we built this plant, I also decided to stay here. I could live anywhere in the State, but I decided to stay here in Vidalia. I like Vidalia and I wanted to raise a family here, so I felt comfortable enough to raise a family here. I fished and I hunted on the river. I'm a hunter and a fisherman. My son is a hunter and a fisherman. I taught him to hunt and fish around Plant Hatch. Since '69, I've been hunting and fishing there. I haven't seen anything that I thought changed the environment. I think I catch as many fish now as I caught in '69. The only thing I see different is maybe there's a few more homes down that way, but I don't see any difference in the deer population. I don't see any difference in any of it. It just seems the same as it always was. I still do about the same things.

A86 As far as one thing that I'd like to say from a businessman's standpoint, the economic impact that Plant Hatch has on us is great. Of course it provides salaries for a lot of people in the surrounding areas, as well as it provides taxes for the infrastructure where we can bring more business into our area.

I just want to say that I feel very comfortable with Plant Hatch, and I appreciate what Plant Hatch has brought to this area. Thank you.

Mr. Cameron: Okay. Thank you, Mr. Dixon. Mr. Lindell -- Cole Lindell --

Mr. Lindell: Half was right. I'm with the Municipal Electric Authority of Georgia. We are co-owners of Plant Hatch. 48 communities in Georgia invested \$3 billion, that's with a b, in Plant Hatch and Plant Vogtle during the construction of these plants.

We are also part-owner of a couple coal-fired units near Atlanta, some combustion turbines, and some hydroelectric power, but our nuclear fleet provides the most cost efficient and reliable base for our operations. We rely on the nuclear fleet and then bring the other units on to provide power as needed.

The present rolling brownouts and blackouts in California, and the price spiking that they saw in San Diego last summer, reflect the wisdom of the people that initially designed, certified, and built Plant Hatch.

A87 As an example, last week during our mini cold snap, we were selling power at \$180 a megawatt. That's times the normal cost. I think we were shipping it down to Florida to pay for all those lawyers, but without Plant Hatch as the basis for our power, your electric bills would have spiked 10 times during the last week. It's awfully hard to run the economy of an area when you're costs are spiking like this. The beauty of Plant Hatch and Plant Vogtle -- our nuclear fleet -- is their reliable baseline that gives us the power we need and keeps our costs way down.

A88 Hatch has been a leader in industrial safety. It also stands high in the performance indicators,
A89 both for the NRC and for the IMPO. We are proud and pleased with our investment and we strongly support renewed operation.

Mr. Cameron: Thank you, Mr. Lindell. Do we have anybody else that wants to say anything at this point? Janisse, you have one final comment for us?

A90 Ms. Ray: I do. I wasn't going to speak and I just decided that I have to go on record. I'm going to send in written comments, but I have to go on record as saying that I am absolutely, completely, vehemently opposed to the re-licensing of the plant, only because I am so concerned about the health effects on the people living around it.

I know you don't have to look at that stuff. I realize too, that I am probably the only person in this room with no economic ties to Plant Hatch at all except that I use the electricity. I think I do -- part of it -- from there. I have no other ties. I have no business. I do have a child and there are children that I love who live here.

That's all I want to say is that I have nothing to gain from Plant Hatch closing or staying open. I can do without the electricity and I am absolutely opposed to the re-licensing. Sorry.

LETTER B

Center for a Sustainable Coast

P.O. Box 598 Darden, Georgia 31105 Voice: (912) 437-8160 Fax: (912) 437-8161

STATEMENT IN OPPOSITION TO THE PROPOSED RELICENSING OF PLANT HATCH

The Center and many others are deeply concerned about the proposed relicensing of Plant Hatch, an aging nuclear power plant in Haxley along the Altamaha River, a short distance from the coast. Not only is the plant one of the nation's oldest facilities still in use, its design is dangerously obsolete, providing no containment structure for protection in case of an accidental release of radioactive contaminants. The Georgians for Clean Energy report that the facility has a history of accidents, suggesting significant threats with continuing operation of Plant Hatch.

Added to the unjustifiable risks of allowing this plant to operate is a new proposal to store spent fuel outside, in concrete casks to be located on the plant site and within close proximity to the Altamaha River, Georgia's largest and most naturally productive waterway. Because of their vital importance to the nation's marine resources, the expansive coastal estuaries supported by the Altamaha are designated as Essential Fish Habitat by the National Marine Fisheries Service. Jeopardizing these indispensable national resources and the existing nature-based business activities that critically depend on them is not justified by the need to keep Plant Hatch operational when there are readily available lower-risk alternatives. Threats of nuclear contamination also impose untold and unreasonable risk on future generations who may suffer various long-term consequences to their health and environment.

Georgians for Clean Energy warn that the proposed outdoor storage is an unproven technology that introduces yet another significant threat to public health and natural resources. Lethal concentrations of radioactive materials released in even a minor accident could cause long-term damage to natural habitat and wildlife resources, not to mention the health and prosperity of tens of thousands of coastal residents who live in the vicinity, especially those whose income is derived from these natural resources.

There are conventional forms of power generation and newly emerging technologies that are far less hazardous, and far more efficient on the basis of accurate and complete assessment of long-term costs and benefits. Under the present situation, the operators of Plant Hatch are, in effect, shifting their costs of operation (including risks) onto the general public, and thereby unfairly profiting by using this dangerously obsolete technology. Relicensing the Plant Hatch nuclear power facility under these circumstances is most definitely not in the public interest according to any objective evaluation of impacts, alternatives, and uncertainties -- as required under federal law.

For these reasons, the Center for a Sustainable Coast declares unqualified opposition to the proposed relicensing of Plant Hatch. We strongly urge the Nuclear Regulatory Commission and Governor Barnes to thoughtfully consider the full implications of the proposed relicensing in light of the region's quality of life as well as our economic interests in the sustainable use and responsible protection of productive natural resources. By denying the Plant Hatch license and supporting the substitution of safer energy alternatives, public officials will be serving the true interests of all Georgians and advancing the standards of accountability in safeguarding the public trust.

Submitted for the record on December 12, 2000
David Kyler, Executive Director
Center for a Sustainable Coast

LETTER C

David L. Meyer, Chief
Rules and Directives Branch
Division of Administrative Services,
Mailstop T # D 59
U.S. Nuclear Regulatory Commission,
Washington, D.C. 20555-0001



PAMELA BUCKLEY ORRIS, D.D. GOLDEN VALLEY
7431 Dallas Hwy, Douglasville, GA 30118 USA

Dec. 10th, 2000

Comments for the Record : in the matter of the Draft Report for Comment concerning the GEIS, Supplement 4, regarding the Edwin I. Hatch Nuclear Plant, Units 1 and 2 and Southern Nuclear Operating Co. Inc.'s desire to re-license this radioactive waste on the face of the planet for another twenty years, and the NRC intending to sanction it.

There is one question the NRC forgot to ask, because NRC was too busy jumping to fulfill Southern's request - NRC forgot to ask how high it should jump up from its grovelling position it takes on, while resting in front of the nuclear industry, in order to get this re-licensing through ; it jumped, and jumped and jumped happily regurgitating large chunks of the License Renewal Application while tossing the phrase "the staff has not identified any significant.....(fill in the blank)" like confetti. As far as the NRC is concerned, radioactively gassing South Georgia via the Direct Torus Vent System while trying to gain time in the event of a MELTDOWN is just fine. That a meltdown at Hatch was calculated in NRC's CRAC - 2 Report and the estimate of the dead (700 dead per Unit based on the 1982 data for population) and of the 20 mile FATAL RADIUS (twenty mile) and the 70 mile (seventy mile) injury radius doesn't matter either - after all, I provided all this information back to the NRC, as one has to show the NRC its own documents and U.S. House of Representatives documents on NRC's documents, as the NRC suffers collective amnesia, and it was ignored. As long as Southern Nuclear says the public is going to evacuate at 8.2 feet a second (p 5-9 GEIS) the question to be answered by Southern is, how fast and how far are the dead meant to be tossed in order to get the bodies out of the area ? Does Southern intend to bring in squads of Olympic weightlifters to help ? Who will toss them, as they die ? How many more will be needed ? How many lead-lined coffins does Southern have in storage to bury the radioactively contaminated dead ? The GEIS has not addressed the issue, or the risk-benefit costs Southern and the NRC love, of lead-lined coffins versus just plain lead coffins and who gets to try lift them. -The ~~metastorological~~ data only covered 3 years - but NRC

ignored what I said about that too. Rather than reargue what I already have said, I am enclosing my May 10th testimony, supplements dated May 29th, June 4th, June 7th, all of 2000, plus my June 15th and June 18th 2000 letters concerning the 2,206 Petition against this dump NRC talked its way out of, with the reminder that THE JUNE 15th, 2000 LETTER SAID IT WAS TO BE PROVIDED TO THE HATCH RELICENSING STAFF AS IT WAS MEANT TO BE PART OF IT ALSO. I would also note that both the NRC and FEMA have been giving me the runaround on the fact that the area could not be evacuated in time etc. etc. and NRC (according to FEMA) did not supply FEMA with all documents, and NRC admitted to me, after

May 2001

A-117

NUREG-1437, Supplement 4

2

an argument we had that would have made the breaking of the sound barrier pale in comparison, that SINCE THE NRC DOES NOT CONSIDER A MELTDOWN CREDIBLE, THEY SENT FEMA WHAT TO WORK ON BASED ON WHAT THEY THOUGHT WAS CREDIBLE - EVEN THOUGH THEY ALSO ADMITTED TO ME THAT A MELTDOWN WAS POSSIBLE. I FIND ALL THIS ABSOLUTELY INCREDIBLE.

I expect everything I have enclosed to be included in full in any and all subsequent GEIS reports on Hatch, Draft or FINAL.

- A. The NRC staff's preliminary recommendation is, quote" that the Commission determine that the adverse environmental impacts of license renewal for HNP are not so great that preserving the option of license renewal for energy-planning decision makers would be unreasonable."
- B. The GEIS also says that the NRC staff considered public comments received during the scoping period for the review.
- C. The GEIS also states that the GEIS serves as the principal reference for all nuclear plant license renewal Environmental Impact Statements.

Regarding "A" above : define "not so great"
Regarding "B" above : If they had considered public comments instead of blatantly disregarding them, the NRC staff would be recommending DENIAL of license renewal - but, as stated earlier, they were too busy jumping to fulfill Southern's request. It's hard to read whilst jumping.

Regarding "C" above : God help us all. The bloody thing isn't worth the paper it's written on.

License renewal is how the NRC and the industry is trying to get around all federal and state laws and other requirements that would come into play if there were a request to license a new nuclear power plant. Because old nuclear plants are so degraded and radioactively contaminated through and through and have contaminated the surrounding environment and population, such license renewals are nothing but an attempt to circumvent current standards and is not only deceitful, but puts the environment and public at grave risk.

To add insult to injury, NRC brought in the D.O.E. - the Death Of the Earth Squad, who have massively radioactively contaminated every site beyond redemption, for millenia, as contributors to the supplement, (p. B-1), for example from INEL, where the plutonium reaches 110 feet below the site and a forty square mile plume of Tritium lies beneath it and they have been brought in regarding Hatch on ecology, water use and hydrology etc. Give me a break! Bringing in the Death Of the Earth Squad as back-up doesn't enhance the NRC's own lousy reputation.

My comments are these two pages and the enclosures. It speaks for itself. And, from now on, whenever the NRC tells me how amazed it is at the depth and breadth of my knowledge, I'm going to ask you all put it in writing. Bearing that in mind, DON'T RELICENSE THIS FACILITY. Shut it down.

Pamela Blockey O'Brien
Pamela Blockey-O'Brien.

PS. Do the Vidalia onion growers know their crops'll be impounded in event of a meltdown and same goes for all farmers ?

[The attachments to this letter appear later in this appendix.]

LETTER D

C03

December 31, 2000
304 Manor Drive
Santee, GA 30571

David L. Meyer, Chief
Rules and Directives Branch
Division of Administration Services, Mailstop T 6 D 59,
U.S. NRC
Washington, D.C. 20555-0001

Dear Mr. Meyer,

**As a citizen of Georgia, I respectfully request the
NRC to deny the relicensing of Plant Hatch.**

C04
C05

I have followed nuclear issues in Georgia for a number of years, have attended risk assessment workshops run by both the U.S. Department of Energy and various non-governmental organizations, and receive regular reports on nuclear activities around worldwide. In other words, this request is not based on mere ideology or vested interest.

C06

C08

C09

We take a big chance if we operate any nuclear reactor beyond the time for which it was designed. The technology is very good, but the consequences of an accident, however remote, are unacceptable.

C07

Furthermore, due to Georgia's proximity to the Savannah River Site and the prospect of a major new undertaking at that location, our state is in danger of becoming a nuclear dumping ground. Do not increase our problems by relicensing Hatch.

Sincerely,

Joan O. King
Joan O. King

2001 JAN -8 AM 8:49

Rules and Directives
Branch
USNRC

D01

D02

D03

Appendix A

LETTER F

NRC Cover Page

Statement presented by Sara Barzacak, Georgians for Clean Energy, at the December 12, 2000, public meeting in Vidalia, Georgia, to discuss the draft supplemental environmental impact statement regarding the license renewal application for Hatch Nuclear Plant, Units 1 and 2.

LETTER E

M.K. PENTECOST ECOLOGY TRUST FUND
3590 DARTON HIGHWAY
SUITE 8
BRUNSWICK, GA 31525
PH: 912-264-1997 / FAX: 912-262-6815
www.savannahpresbytery.org

December 18, 2000

Luis Reyes
Nuclear Regulatory Commission (Local)
61 Forsyth Street Suite 23T85
Atlanta, GA 30303

Re: Relicensing of Plant Hatch

Dear Mr. Reyes:

Relicensing Plant Hatch for another 20 years, I believe, is not the most prudent direction for us to take as we work on our energy needs for Georgia's future.

E01

Having the nuclear repository of spent fuel in such an environmentally vulnerable region of the state is a serious concern. The natural areas, aquifer recharge zones and fish habitat which are downstream from Plant Hatch contribute significantly to Georgia's economic stability and diversity. Georgia's agricultural productivity, seafood industries, tourism industry, as well as the forestry industry along the Altamaha River and south coastal areas are at perilous risk with the radioactive waste stockpile at Plant Hatch.

E02

To add the the volume of spent fuel that 20 additional years of operation would produce is more risk than I think should be taken for Georgia's citizens, environment, and economy.

E03

Wiser action, it seems to me, is to proceed with research in and support of renewable energy projects. Georgia and The Southern Company are lagging behind others in the whole renewable energy arena. Since we are one of the top ten fastest growing states in the nation, I would expect more creative energy leadership for our citizens.

E04

Sincerely,



Merriam A. Bass
Staff Associate for Ecology



Dr. Carl Schlich, Executive Presbyter
Merriam A. Bass, Staff Associate for Ecology



Hatch Comments:

My name is Sara Barczak. I have been working with Georgians for Clean Energy for over a year. We are a non-profit conservation and energy consumer organization that has been working to promote safe and environmentally sound energy policies for Georgia for almost 20 years. My primary expertise is in biology and I work in our Savannah field office.

My organization has submitted written comments and presented oral comments at public meetings since the Hatch re-licensing process began. And while I myself was not able to attend the public meetings back in May, I did help compile our formal written comments that we submitted in June. I did read through all of the oral comments that were presented in May. What I was struck by is that very few people spoke about what the scope of what the NRC had requested—the environmental impacts of Plant Hatch. From my notes, our facilitator today, Mr. Cameron, was also the facilitator then. And he explained then that:

"...our [NRC] purpose today is to gain insights on the environmental issues related to the Hatch licensing renewal applications...But we want to try to keep us focused on the environmental aspects of license renewal to make sure that we hear all of the comments on this issue before we leave here today."

Almost everyone spoke about how wonderful nuclear Plant Hatch is for the economy and how Hatch has been such a good neighbor because it provides such a large percentage of Appling County's tax base—68% in 1998 alone—and they don't know where they'd be without Hatch. Yet, economic studies in the Savannah River Site region have shown that it isn't healthy for a region's economy to have a nuclear industry contributor that provides even as high as 14% of the local tax base. Such reliance is not healthy. My organization is very concerned that the community is focusing almost entirely on perceived economic benefits and is overlooking the environmental impacts along with the long-term economic growth implications—including the possibility that there could be a meltdown and catastrophic consequences to the local resource base.

I was struck by the fact that the sheriff of Appling County didn't talk about emergency planning concerns, security issues, and terrorist threats but rather on how great the plant was. People also spent a lot of time explaining where they were from. The highest vulnerability from the plant is within this local area. I am from Savannah and we are also vulnerable in terms of an accident. I do care about what happens here. I am concerned about our region, its people and land. I sometimes lay awake at night thinking about our members near the plant—and all of you.

Georgians for Clean Energy is here to tell the NRC that this nuclear plant should not be re-licensed for a variety of reasons. But today we are to speak about the environmental impacts and the draft Generic Environmental Impact Statement, Supplement 4. So I will speak about those.

Let me go back to something Mr. Cameron said at the last meeting, the one in May:

"But I want to emphasize that any comments we hear from you today will be considered by the NRC as formal comments on scoping. You don't have to send anything in writing to get these on record."

We would like to state publicly that Georgians for Clean Energy does not believe that statement. We sent additional written comments to supplement our previous oral statements and feel that those efforts, which were quite time-consuming may I add, were not given consideration in the draft GEIS that we are now discussing nor were they included in the appendices. All statements submitted either in written form or orally should have been included in this draft GEIS. Valid and strong statements of environmental concern were made and were supported by a multitude of documents that the NRC needs to pay attention to and we are disappointed that the first team of reviewers did not.

We request that this panel re-evaluate all of the oral and written comments concerning environmental issues that were previously presented to the NRC during the Environmental Impact Statement process and license renewal meetings.

We take issue with Appendix D, "Organizations Contacted". Not one non-governmental environmental or conservation organization was contacted. It appears that in this Environmental Impact Statement, effort was put forth to contact realtors but not one group that focused on the environment, health issues, or conservation issues. State of Georgia agencies that were contacted do not have expertise in radiation and its effect on species as a whole and the ecology of the region.

Everyone here knows that we've been experiencing a very tenacious drought and that water issues are on the forefront of many people's minds, including our Governor. The Altamaha River is very important to this region, for wildlife, commercial fisherman, recreational enthusiasts, and more. And Plant Hatch has to rely on water resources too—and Hatch relies on them to an alarming degree. According to the licensee, Hatch is permitted to withdraw a monthly average of 72 million gallons of water per day with a maximum 24-hour rate of up to 104 million gallons per day from the Altamaha. Hatch's average is about 57 million gallons per day with about 25 million gallons returned to the river. So, overall, on average Hatch consumes about 33 million gallons of water per day that is impacting the river flow. That is a problem under severe drought conditions and could alter river habitat in unexpected ways. Furthermore, we should not forget that Hatch is permitted to use a monthly average of 1.1 million gallons of water per day from the Floridian Aquifer. When this plant was licensed, the severe concerns over our water resources did not exist. These permits and conditions need to be re-evaluated based on current laws and regulations. If this were a new nuclear plant that they were trying to license, they would need to comply with all current state and federal water usage and pollution control standards. This license application renewal should be viewed in the same light. Yet according to this draft GEIS, license renewal will not have an adverse impact on the Altamaha ecosystem. We challenge that determination.

Since Hatch was built, the Southeast has entered a period where we have had more droughts and more severe droughts. We do not believe that the NRC has conducted a thorough and site-specific investigation of this issue. At the very least, the NRC needs to more accurately

determine how Hatch impacts the region during extended drought conditions. A consumptive loss of 3.1 % during minimum discharge periods is not insignificant and certainly needs to be researched further. For instance, how does the NRC know whether or not the drought, and the strain that Hatch places upon the river's flow during a drought, doesn't increase the stress on the already endangered shortnose sturgeon to a level that the species can no longer handle? The GEIS does not address this. Additionally, the GEIS didn't address concerns around discharge temperatures at the point it enters the river or within the mixing box. A maximum discharge temperature in the mixing box, which is reported to the EPD quarterly, was 94 F in the summer. Does that affect the river more so during periods of drought, in which fish and plants, etc. are already stressed? What is the temperature at the discharge pipe on a daily basis? If that's not being measured, why not? These studies need to be done before a license extension can be granted. Additionally, why hasn't the EIS addressed additional water quality concerns regarding the release of radioactive contaminants to the environment? We will identify further water quality concerns in our written comments.

In cases of flooding on the other hand, which also occur, special precautions are needed that the draft EIS does not address. [I refer you to prior testimony that was raised by others and ourselves on the flooding issues.]

And though many people at the first hearing seemed convinced that nuclear power does not release emissions into the environment, I would like to point out that radioactive water vapor is lost to the atmosphere everyday...it is a fact of nuclear power plant operation. In Hatch's case, an average of 33 million gallons of water per day is lost—primarily in the form of radioactive water and radioactive water vapor. And it is unfair and misleading to the community to be told otherwise. Through the water cycle, the contaminated vapor is often deposited in the form of precipitation. This precipitation then makes its way into our rivers, groundwater supplies, and onto the grass that our cows eat, and through the ingestion pathways, eventually to the milk in our coffee. State EPD reports show that measurable levels of man-made radioactive contaminants are found in vegetation samples. How can the NRC determine that a license extension of plant Hatch will not add to the stress of the many rare and threatened plant species in this area? Especially when many plant species are already undergoing stress under drought conditions along with continuous contamination from the Hatch facility. It is an established scientific fact that radioactive contaminants bioaccumulate up the food chain.

There are of course regulatory limits—but let's remember that these limits were not set with the health effects of low level radiation exposure in mind. The limits were generally set to allow industry to operate. Studies on the effects of tritium, which is essentially radioactive hydrogen, a primarily man-made radioactive element produced during nuclear reactor operation, have found that it easily crosses the placenta and may have the greatest impact on the developing fetus. As water, tritium can easily enter our cells. Yet our drinking water standards base the tritium limits on the average man. Cesium-137, which is also a man-made radioactive contaminant and gamma emitter, has been measured in fish, shrimp, and crab samples as far down as Wolf Island. It is a fact that the decay products coming off of nuclear power plants, whether it is through the stack or directly into the water, generate Cesium-137 and Strontium-90, among others like plutonium and Cobalt-60. Cesium-137 mimics potassium and collects in the muscles. Strontium-90 mimics calcium and collects in our bones—leading to many types of bone cancers.

The elderly, children, and people with immune disorders are most susceptible to the effects of ionizing radiation.

At the meetings last May, people spoke about how the fish still taste good, maybe even better. Radioactive contamination is the most insidious form of pollution perhaps because it is the most sly...you can't see it, taste it, or smell it. So it's hard for people, including our regulatory agencies, to understand it. The fish won't taste different. They'll just have stuff in them that may be affecting them and their offspring just as it may eventually affect you and your offspring. The gene pool is being affected.

Back to the economics that people love to talk about. Plant Hatch sits alongside the Altamaha River, Georgia's largest waterway, near prime agricultural areas and is two counties upstream from Georgia's Golden Isles. The interests of South Georgia's communities and the thousands of nature-based jobs that support at least one-fifth of our region's economy are impacted by the NRC's decision to re-license this aging nuclear plant. Georgians for Clean Energy demands that the NRC conduct proper, site-specific evaluations of the ACTUAL impact of Plant Hatch on this region. Past plant operations, accidents, spills, worker contaminations, and routine releases have to be considered which are already listed on the NRC's own docket and have obviously gone unread.

For example, here is a brief list of licensee event reports that are required to be filed for incidents that occurred in the last week of August and for the month of September (these are not violations, not inspection reports, and there are often other events that are not required to be reported, separate from those with different criteria):

- 8/31/00 Failed relay results in unplanned actuation of engineered safety features
- 9/4/00 Trip of 600-volt supply breaker causes loss of reactor power system protection supply and unplanned ESF system actuation
- 9/8/00- Component failure resulting in erratic flow signal rendered the high pressure coolant injection system inoperable—previous events like this in past 2 years in licensee reports: 4 times so this is the fifth
- 9/11/00 Inadequate procedure resulted in an unplanned actuation of an engineered safety feature (actuation means start-up)—reactor coolant flowed into something it shouldn't have
- 9/20/00 Component failure results in failure of an engineered safety feature to actuate. A primary containment isolation valve failed to close as expected. (To contain the radiation).
- 9/25/00 Unauthorized person enters protected and vital areas. Contract worker entered the area to perform normal duties—required checks were not performed prior to entering. Personnel error occurred in the Badge Office.
- 9/27/00 Personnel error results in a condition prohibited by the plant's technical specifications—the B loop of the core spray system was rendered inoperable (that would cool down the reactor). The A loop of the low pressure coolant injection (LPCI) function of the residual heat removal systems had previously been rendered inoperable as well for scheduled testing. These systems would help protect the public in case of a major accident.

F01

May 2001

A-121

NUREG-1437, Supplement 4

-9/29/00 Trip of the reactor feed water pump resulted in low reactor water level and a manual reactor SCRAM (shut down reactor in a hurry by hand. Water levels were low and serious)—level reached a minimum of approximately 40" below instrument zero causing the automatic initiation of the reactor core isolation cooling system and the high pressure coolant injection system

Simply stated, the plant is aging, and there's no excuse for an unauthorized person to enter the plant. The NRC needs to read the entire docket-- every violation, every LER, everything going back to start-up. No one would allow this place to be re-licensed if they sat down and read the entire docket.

And please include in the EIS review new problems of incidences and indicators of problems at Hatch that have developed in the past few months. We strongly believe, given the extensive documentation that we have collected, that if a proper analysis were done, the NRC would have no other choice but to deny nuclear Plant Hatch's license renewal application.

If this license renewal application goes through, there will be many heavy stones left unturned. And unfortunately, the health of this community and surrounding regions is what we stand to lose and we can't afford that, nor do we accept that.

Thank you.

LETTER G



United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Richard B. Russell Federal Building
76 Spring Street, S.W.
Atlanta, Georgia 30303

January 17, 2001

ER-00/843

Chief, Rules Review and Directives Branch
Division of Administrative Services
Mailstop T 6 059
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sir:

The Department of the Interior has reviewed the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 4, Edwin I. Hatch Nuclear Plants, Units 1 and 2, Appling County, Georgia, as requested.

General Comments

The Altamaha River and its surrounding environs and wetlands provide habitat essential to many species of fish and wildlife including neotropical migratory songbirds, wading birds, reptiles and amphibians, mammals, and important inter-jurisdictional fishery resources. Since, no new construction or increase in operating conditions is proposed as part of the license renewal, adverse impacts to terrestrial resources from continued operation of Plant Hatch should be minimal with the exception of radiological impacts. Fishery resources of particular concern to the Fish and Wildlife Service (FWS) are anadromous species, including American shad, hickory shad, blueback herring, striped bass, the Atlantic sturgeon, and shortnose sturgeon. American shad, striped bass, and sturgeon have historically been a significant commercial fishery along the Altamaha River, and populations of all of these species have experienced dramatic declines in the past from which they currently have not recovered. The FWS is also concerned about potential adverse impacts to other resident species, including largemouth bass, redbreast sunfish, and native riverine suckers. The Altamaha River provides important recreational opportunities for the residents of and visitors to Georgia. The Altamaha River is a destination for many out of state anglers and is a critical element of the natural heritage of Georgia.

The FWS remains concerned that the entrainment and mortality of fish at Plant Hatch has not been effectively evaluated for the combined 2-unit operation which began in late 1979. The FWS letter dated November 8, 1999, indicated concern about fish entrainment and mortality at Plant Hatch and requested additional information to evaluate the potential impacts of project license renewal on those aquatic resources. On December 7, 1999, the FWS received a response from Southern Nuclear Operating Company (SNC) which included a Biological Information Update, the 1981 Thermal

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G02

Appendix A

Plume Model Verification Study, and the 1981 316(b) Demonstration Study to evaluate fish entrainment at the plant. Additionally, after the completion of the 1981 studies, a low water weir was constructed in the Altamaha River which may significantly increase the potential for fish entrainment by changing the physical surroundings of the intake structure. Entrainment of aquatic species must be evaluated for river conditions where the weir affects the water intake for Plant Hatch.

Construction of Plant Hatch Unit 1 began in 1968 and commercial operation began in December 1975. Plant Hatch Unit 2 construction began in 1972 and commercial operation began in September 1979. Entrainment samples for Plant Hatch were collected in 1974, 1975, 1976, 1979, and 1980. Samples were collected weekly from 1974 through 1976 and monthly in 1979 and 1980. During nearly all of the sampling period, 1974 through September 1979, only Unit 1 was operating at Plant Hatch. Unit 2 began operating in September 1979, and the only data on fish entrainment and mortality at Plant Hatch under normal 2-unit operation was collected during the "monthly" sampling conducted in 1980. Given that the information on fish entrainment and mortality at Plant Hatch is over 20 years old and only represents one year of monthly collections under normal 2-unit operation, the FWS is concerned that these data do not reflect the actual fish entrainment potential at Plant Hatch and cannot be reliably used in evaluating the potential adverse effects on fishery resources in the Altamaha River.

The existing water intake structure for Plant Hatch is approximately 150 feet long and 60 feet wide and stands approximately 60 feet above the normal water elevation. The water intake openings are 27 feet wide and extend from 16 feet below to 33 feet above normal water elevations. Large woody debris is removed by trash racks of an unknown dimension, and smaller debris is removed by vertical traveling screens with a 3/8 inch mesh. SNC also reports that intake velocities increase with lower river levels, but specific values are not reported for any evaluation. Based on some of the intake velocities reported in the 1981 316 (b) Report, it is likely that 2-unit operation at Plant Hatch, particularly during spawning seasons, may have significant adverse impacts on fishery resources through increased entrainment of eggs, larvae and juvenile fish, especially in years with lower than usual flows such as occurred in 1999 and 2000. The FWS recommends that SNC conduct a thorough and complete assessment of fish entrainment and mortality at Plant Hatch under various flow conditions that reflect actual normal 2-unit operation and 2-unit operation at low river flows.

The FWS letter dated November 8, 1999, also indicated concern about the potential impacts of thermal discharges from Plant Hatch on aquatic species in the Altamaha River, and requested additional information to evaluate the potential impacts of project license renewal. The existing NPDES permit for Plant Hatch has established limits for the thermal discharge which is not to exceed 90 °F or 5 °F above ambient. Twelve thermal plume monitoring surveys were conducted during 1980. Seven of these 12 monitoring surveys showed inconclusive results according to the 1981 report. Three of these surveys were conducted with only one cooling tower releasing heated water. Three additional surveys did not detect a thermal plume. The remaining survey postulates that on August 12, 1980, a "secondary thermal plume" was the cause of "excessive solar heating" of adjacent

G09

shallow water, and that the survey of the thermal plume from Plant Hatch was biased due to hot weather. These results cannot be considered reliable due to the very limited field verification of the nearly 30-year old model in which seven of only 12 field surveys of the thermal plume were "inconclusive." The notion that a "secondary plume" had developed near a sandbar during a hot August day must be rejected since this is a natural occurrence during the summer months, and the purpose of the model and the study was to determine whether Plant Hatch would be expected to adversely impact aquatic resources of the Altamaha River regardless of natural conditions. The thermal impacts of the heated discharge may also become exacerbated during low flows where the weir within the river channel may affect the dilution of heated effluent due to altered flow patterns and river channel dimensions.

G03

The FWS is concerned that the results of the Thermal Plume Model and the field verification survey are not capable of characterizing impacts to the river or temperature deviations resulting from the full 2-unit operation of Plant Hatch during low summer and fall flows. The FWS recommends that SNC conduct actual field measurements of the discharge and the resulting temperature plume in the Altamaha River under various flow conditions during the warmer months. Actual field data on heated water discharges from Plant Hatch is critical during low flow periods when the river experiences drought or near drought conditions. These low flow periods are when the potential impacts to aquatic species in the Altamaha River are the greatest. These acute impacts are due to higher ambient water temperature, reduced dilution of wastewater from upstream sources, the increased percentage of river flow consumed at Plant Hatch, and the significantly reduced dilution potential for the heated effluent. Field studies of the thermal discharge should be conducted, at a minimum, on a daily basis during various river conditions and the critical low flow periods in summer and fall when ambient water temperature is highest and dissolved oxygen is lowest.

G04

Section 4.3 of the EIS for Plant Hatch addresses the radiological impacts of normal operations, which does not include a discussion of the radiological impacts to fish and wildlife. Further, the EIS does not describe the actual levels of radiation in the ambient environment or the level of increase attributed to operations at Plant Hatch. Section 4.3 only states that the radiation dose to the general public will continue at current levels, and that occupational doses would be below regulatory limits without indicating the actual values for Plant Hatch. Our understanding from SNC was that the issues raised in the November 8, 1999, letter would be addressed in further detail in the Draft EIS. The FWS contends that the radiological impacts to the environment have not been evaluated for Plant Hatch in the draft EIS, and that avoidable impacts to fish and wildlife resources may exist and have not been carefully considered.

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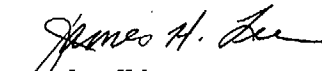
The FWS letter dated January 13, 2000, indicated, based on the information provided by SNC, concurrence with SNC's determination that license renewal for Plant Hatch would not adversely affect threatened or endangered species under purview of the FWS. Our understanding is that Section 7 consultation has been initiated with the National Marine Fisheries Service concerning potential impacts to the federally-threatened shortnose sturgeon.

May 2001

As the Federal agency responsible for the protection and conservation of fish and wildlife resources in the Altamaha River, the FWS recommends that the NRC require a thorough fish entrainment and mortality study to be conducted to adequately characterize fish entrainment under full 2-unit generating conditions prior to any license renewal for Plant Hatch. We further recommend that thorough field studies be conducted to evaluate actual thermal discharges under full 2-unit generating conditions during low flow periods for multiple years. Further, we recommend that the radiological environment of Plant Hatch be fully described, and the potential for impacts to the environment and fish and wildlife resources evaluated according to appropriate scientific methods.

Thank you for the opportunity to review and comment on the Draft Generic EIS for Edwin I. Hatch Nuclear Plant. If you have any questions or comments or need additional information please, contact staff biologist Mark D. Bowers of the Fish and Wildlife Service, Georgia Ecological Services Field Office, at (706) 613-9493.

Sincerely,


James H. Lee
Regional Environmental Officer

A-123

NUREG-1437, Supplement 4

LETTER H

January 19, 2001

SUBJECT: statement of opposition to proposed relicensing of Plant Hatch nuclear Power plant.

Dear Sir:

Georgia Coast Watch is very much in opposition to the proposed relicensing of Plant Hatch. Just downstream from the Plant is a thriving fishing industry of fish, shrimp, crabs, and shellfish, and a multimillion dollar tourism industry which could not survive a nuclear accident. I will not go into the obsolete design and record of past accidents of Plant Hatch. They are well known, and most are documented. If a person were to carefully choose a spot where a nuclear power plant should not be placed, this sensitive bioregion on the Altamaha river would be chosen. The relicensing of this aged, and dangerous plant would be a crime against nature and a slap in the face to those who work and live downstream. If the plant continues to operate we will work diligently to increase public awareness of this killer in our backyard and we will employ non-violent civil disobedience when necessary.
Submitted for the record, January 19, 2001.

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H02

Sincerely,

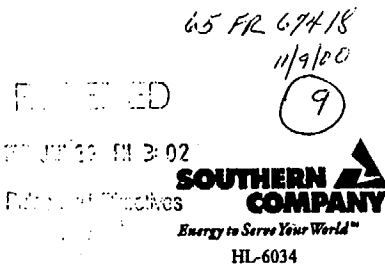

Gary G. Drury
Georgia Coast Watch
Rt. 9, Box 281
St. Simons Island, Ga. 31522
ggdrury@earthlink.net
(912) 638-6852

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LETTER I

Lewis Sumner
Vice President
Hatch Project Support

Southern Nuclear
Operating Company, Inc.
40 Inverness Parkway
Post Office Box 1296
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Tel 205.992.7279
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January 23, 2001

Docket Nos. 50-321
50-366

Chief
Rules Review and Directives Branch
Division of Administration Services
Mailstop T 6 D59
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Edwin I. Hatch Nuclear Plant
Comments on Draft NUREG-1437, Generic Environmental Impact Statement
for License Renewal of Nuclear Plants, Supplement 4
(65 Federal Register 67418 dated November 9, 2000)

Ladies and Gentlemen:

Southern Nuclear Operating Company (SNC) has reviewed the draft NUREG-1437, Supplement 4, for Edwin I. Hatch Nuclear Plant, Unit 1 and 2, published in 65 Federal Register page 67418, dated November 9, 2000. SNC is providing the enclosed comments as requested.

If you have any questions regarding these comments, please contact this office.

Respectfully submitted,

Lewis Sumner

H. L. Sumner, Jr.

HLS/JTD

Enclosure: SNC Comments on Draft SEIS for HNP

U. S. Nuclear Regulatory Commission
Page 2

cc: Southern Nuclear Operating Company
Mr. P. H. Wells, Nuclear Plant General Manager
Mr. C. R. Pierce, License Renewal Services Manager
SNC Document Management (R-Type A02.001)

U. S. Nuclear Regulatory Commission, Washington, D.C.
Mr. C. I. Grimes, Branch Chief, License Renewal and Standardization Branch
Mr. L. N. Olshan, Project Manager - Hatch
Mr. W. F. Burton, Project Manager - Hatch License Renewal
Ms. Brenda J. Shelton, Chief, Information and Records Management Branch

U. S. Nuclear Regulatory Commission, Region II
Mr. L. A. Reyes, Regional Administrator
Mr. J. T. Munday, Senior Resident Inspector - Hatch

SNC Comments on Draft SEIS for HNP

General Comments

1. Emphasis on Archeological/Historic Resources

There appears to be an overstated emphasis throughout the SEIS on the significance and potential of impacts to historic/archeological resources on the HNP site. This is most pronounced in Chapter 2, but is also evident in other chapters. The level of detail in the Section 2.2.9 discussion of historical/archeological resources seems out of proportion considering the historic/archeological impacts section in Chapter 4 which states "Consultation between the license renewal applicant and the Georgia State Historic Preservation Office resulted in a determination by the State office that no known historic properties included in or eligible for inclusion in the National Register of Historic Places would be affected by the proposed action." The section also concludes that impacts to these resources from license renewal would be "SMALL."

The CEQ regulations ("Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act") provide the following guidance on environmental impacts:

- "Environmental impact statements shall be analytic rather than encyclopedic... There shall be only brief discussion of other than significant issues." (40 CFR 1500.2)
- "The environmental impact statement shall succinctly describe the environment... to be affected by the alternatives. The descriptions shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses... shall be commensurate with the importance of the impact..." (40 CFR 1502.15)

The sheer weight of the information begins to confer significance on impacts that have been determined to be "SMALL". Chapter 4 (p. 4-26) of the SEIS states that license renewal is unlikely to jeopardize cultural resources and may, in fact, "...have a beneficial effect..."

It is recommended that Section 2.2.9 (Historic/Archeological Resources) be shortened and made more concise.

2. Scope of Chapter 8

Chapter 8 currently discusses potential impacts of "dramatic" post-decommissioning land-use changes, especially those associated with "eventual sale or transfer of the land" (p. 8-3). Based on the speculation that these dramatic land-use changes are a given (or at least a reasonably foreseeable possibility), Chapter 8 goes on to suggest that impacts to unidentified historic/archeological resources could be "SMALL to LARGE." In fact, it is difficult to predict future use of the unrestricted property, however any post decommissioning land-use would be subject to applicable environmental and resource laws. SNC recommends that the discussion of speculative "dramatic" potential impacts be avoided in Chapter 8. SNC recommends revising the conclusions in table 8-1 for Historic and Archeological Resources to "SMALL" with a revision to the comment.

Specific Comments

The following matrix contains specific comments and their proposed resolutions. Text recommended for deletion is shown as lined out (i.e., ~~deleted text~~). Recommended new text is shown as underlined (i.e., new text). Most comments are primarily editorial while some are more substantive.

101

102

103

Page/line #	Comment	Proposed resolution
Page 1-9, Table 1-1, Lines 7,9,12,14,16	Some permits include "state" in the requirement column description. To clarify that the permits are state and not federal, SNC recommends adding the word "state" to the items described. Also add the identified words for clarification.	Requirement Column: <u>State</u> air quality <u>State</u> drinking water quality <u>State</u> storm water discharge <u>State</u> NPDES discharge permit <u>State</u> solid waste landfill
Page 2-4, Figure 2-3	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	See the revised Figure 2-3 attached which identifies the location of wells 4 and 5.
Page 2-11, Lines 32 and 34	SNC recommends clarification of description of mixed waste and hazardous waste.	HNP also provides for <u>accumulation and temporary onsite storage</u> of mixed wastes, which contain both radioactive and chemically hazardous waste. Storage of radioactive material is regulated by the NRC under the Atomic Energy Act of 1954 (AEA), and <u>accumulation and temporary storage</u> of hazardous wastes is regulated by the U.S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act of 1976 (RCRA).
Page 2-12, Line 1	A copy of the ODCM is only included if the ODCM was revised during the year.	Includes the ODCM as an appendix if it is revised during the year covered by the report (Southern Company 2000a).
Page 2-14, Line 1	From review of preceding text and review of plant drawings, the offgas recombiner building should be included in this description.	The major system components are located in the turbine building, <u>offgas recombiner building</u> , and in the waste gas treatment building.
Page 2-14, Lines 34-36	Per our review of HNP FSAR and year 2000 49 CFR, it appears that 171 through 185 would apply to HNP.	Solid waste is packaged in containers to meet the U.S. Department of Transportation requirements in 49 CFR Parts 171 through <u>427-185</u> . Disposal and transportation are performed in accordance with the applicable requirements of 10 CFR Part 61, and Part 71, and 49 CFR Parts 171-185 <u>respectively</u> .

Page/line #	Comment	Proposed resolution
Page 2-15, Line 1	Please add text to clarify that number is for disposed waste.	From year to year, the volume of radioactive contaminated waste generated will vary. The average value of disposed waste at HNP over the past 5 years is about 320 m ³ (11,300 ft ³).
Page 2-20, Line 6	Permit has been revised since application to allow a change in monthly average. This change in the application was communicated to the staff by letter dated December 15, 2000.	SNC is permitted (Georgia Department of Natural Resources [GADNR] Permit 001-0690-01) to withdraw a monthly average of up to 273,000 m ³ /d (72 million gpd) 322,292 m ³ /d (85 million gpd) with a maximum 24-hour rate of up to 392,000 m ³ /d (104 million gpd). As a condition of this permit, SNC is required to monitor and report withdrawals.
Page 2-20, Line 31	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Although the current permit indicates four six onsite wells, there are actually only three wells providing groundwater for domestic and process use. Wells four and five provide water for irrigation of ornamental vegetation. The fourth sixth well was intended to provide make-up water for a wildlife habitat pond that was not completed; therefore, the well has not been installed.
Page 2-21, Line 4	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Change "three" to "five"
Page 2-21, Line 37	SEIS states that HNP is located in western Georgia. Various other references to HNP location state south central Georgia.	Change "western" to "south-central".
Page 2-28, Line 15	Drinking water samples are not included in the REMP	shoreline sediment and water samples from the Altamaha River, and drinking water samples).

Page/line #	Comment	Proposed resolution
Page 2-28, Line 30	For clarification between ODCM results and REMP make the following changes.	Southern Company reported the following estimated whole body doses to the most limiting member of the public for 1999: - approximately 0.00064 mSv/yr (0.064 mrem/yr), based on vegetation, fish, and sediment results from the HNP environmental monitoring program (Southern Company 2000b) - approximately 0.00074 mSv/yr (0.074 mrem/yr) based on gaseous and liquid effluent releases (Southern Company 2000a). For 1999, dose estimates were also calculated based on radioactivity detected in the environment and attributed to plant operations as part of the REMP. Southern Company reported the following potential whole body doses to the most limiting member of the public for 1999: - approximately 0.00046 mSv/yr (0.046 mrem/yr) based on vegetation, 0.00013 mSv (0.013 mrem/yr) based on fish, and 0.000049 mSv/yr (0.0049 mrem/yr) based on sediment (Southern Company 2000b).
Page 2-33, Line 21	States that the US 1 widening project is expected to be "undertaken" within 5 years. However, the reference document states that this project is anticipated to "begin" within 5 years. "Undertaken" implies that it will be completed in that time frame.	Change the wording "expected" to "anticipated" and "undertaken" to "begin".

Page/line #	Comment	Proposed resolution
Page 2-38, Line 21	In Table 2-13 the last number in the 30-40 Miles column is incorrect.	Change this number from 82,270 to 87,270.
Page 2-42, Line 24	The text refers to one "historical site" known to exist on the HNP site, the Bell Cemetery. While the phrase "historical site" is not defined, its use within the section entitled "Historic and Archaeological Resources at HNP" can suggest an unintended meaning. This is because related regulations define "site" as a location of a significant event, activity, or structure [36 CFR 60.3(l)] and "historic property" as something included in, or eligible for inclusion in, the National Register [36 CFR 800.2(e)]. NRC does not seem to suggest that the Bell Cemetery has historical significance and, in fact, cemeteries or even graves of historical figures ordinarily are not considered eligible for inclusion in the National Register (36 CFR 60.4). As communicated in SNC letter, dated August 11, 2000, Plant Hatch is required by "Georgia Power's Human Remains Policy" to protect any known or discovered cemeteries or burial grounds whether it is a historical site or not.	Only one unrecorded historical site is known to exist on the HNP. This is the Bell Cemetery that is indicated...
Page 4-26, Line 25.	See comment for Page 2-42, Line 24	Delete the word "historic"

Page/line #	Comment	Proposed resolution
Page 4-26, Lines 32-35	The text seems to suggest that SNC would have to perform a formal study to determine the likelihood of cultural resources being present before, for example, logging. A requirement for performing cultural resource evaluations has not been required of previous license renewal applicants. For HNP and the previous plants, NRC indicated that studies in the area found cultural resources and NRC imposed on the applicants only the standard of care. There is no apparent basis for treating HNP differently and the discussion on an evaluation should be deleted.	Such activities may include not only operation of the plant itself but also land management-related actions such as ground disturbance. Since the plant site has not been subjected to an intensive cultural resources field survey to identify and record all cultural resources, any landscape modification or ground disturbance of previously undisturbed areas should be preceded by a cultural resource evaluation to fulfill obligations under the National Historic Preservation Act of 1966 and implementing regulations.
Page 4-31, Line 16, 18	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Change "yield" to "use" Add to end of paragraph: Two smaller wells for irrigation of ornamental vegetation were placed in service in early 2000. Those wells typically draw 9000 GPD each and are used as needed.
Page 4-32, Line 10	HNP revised permit and added two wells for irrigation of ornamental plants after ER was written. This change in the application was communicated to the staff by letter dated December 15, 2000.	Add to end of paragraph: Irrigation wells four and five are also located in the Floridan Aquifer. A sixth well has been permitted in the Miocene Aquifer but has not been constructed.
Page 4-34, Line 33	Clarify text to edit description of shortnose sturgeon. As written the text could imply differences from other shortnose sturgeon	Thus, an additional 20 years of operation of HNP should not affect the viability of the Altamaha River shortnose sturgeon or result in any population decline.

Page/line #	Comment	Proposed resolution
Page 4-32, Line 35	Section 7(2) of the Endangered Species Act reads as follows: "Each Federal agency shall, in consultation with and with the assistance of the Secretary (of Interior), insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or modification of habitat of such species...which is determined...to be critical, unless such agency has been granted an exemption for such action. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available." Both the NRC and SNC biological assessments for the shortnose sturgeon are based on the "best scientific and commercial data available" and indicate that the impact would be small. The conclusion at the end implies that this is potentially an open item. SNC recommends that preliminary be deleted.	Based on the results of the NRC biological assessment, it is the staff's preliminary conclusion that the impact to the shortnose sturgeon is SMALL and that mitigation is not needed.
Page 6-2, Lines 16, 17, 19, and 20	Table 6-1 appears to contain an incomplete listing of GEIS Sections.	Add Section 6.6 to the GEIS Sections column in Table 6-1.
Page 8-3, Line 34	There are currently no known or identified Historic and Archaeological resources on the Plant Hatch site. Text implies that there are currently known resources and implies that the Visitors Center is one of them. These resources should be included in the socioeconomic paragraph and not under a heading titled "Historic and Archeological Resources. SNC also recommends revising conclusion as stated in the General Comments section.	Historic and Archaeological Resources: The potential for future adverse impacts to known or unrecorded cultural historic and archeological resources at the HNP site following decommissioning will depend on the future use of the site land. Known resources and activities include the current Visitors Center and associated interpretative efforts that are funded and maintained by SNC. Eventual sale or transfer of the land within the plant site could result in adverse impacts on these resources should the land-use pattern change dramatically.

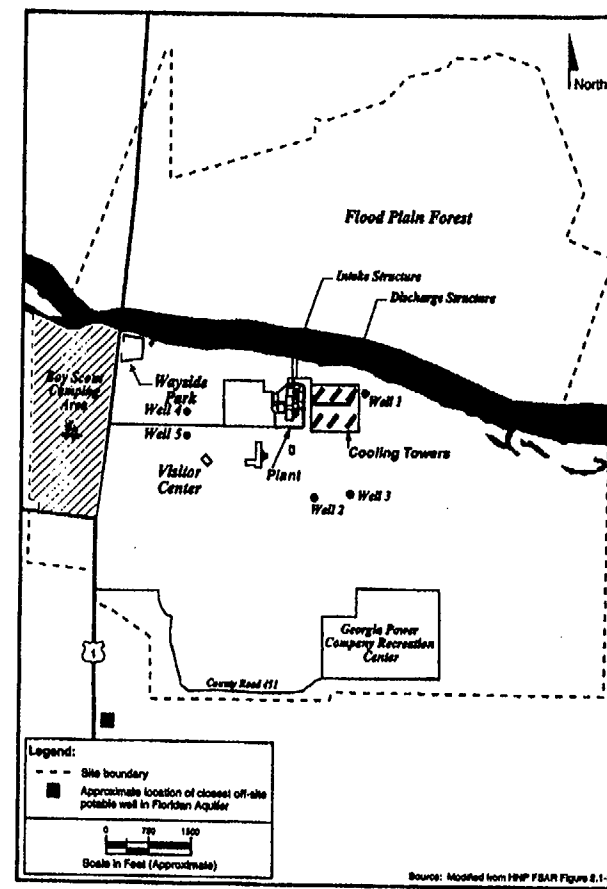


Figure 2-3. Hatch Nuclear Plant Property Plan

May 2001

LETTER J

Lonise C. Barrett, Commissioner
David Waller, Director

Georgia Department of Natural Resources Wildlife Resources Division

2070 U.S. Highway 278, S.E., Social Circle, Georgia 30026
(770) 918-6400

January 22, 2001

Chief
Rules Review and Directives Branch
Division of Administrative Services
Mailstop T 6 D59
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Sir:

The Georgia Wildlife Resources Division (WRD) offers the following comments on the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 4, regarding the Edwin I. Hatch Nuclear Plant Units 1 and 2. The report does not adequately address the affects of water withdrawals and blowdown during extreme drought conditions. Reduced withdrawals should be evaluated, and an emergency drought plan should be developed which would be implemented whenever river discharge drops below a pre-determined minimum level.

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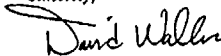
State and federally protected plants and animals were identified on the area and within transmission line corridors. Plant Hatch personnel should coordinate with WRD in the management of these transmission line corridors and areas outside of the plant operational boundaries to insure that management practices are not detrimental to these protected species.

J03

Additionally, the Plant Hatch facility could provide much needed public access to bank fishing on the Altamaha River. We feel Wayside Park, which is operated by Plant Hatch, could be improved to provide bank fishing or a fishing pier. WRD staff would like to see fishing access provided at this location or elsewhere on the site and would be available for consultation to design this access. Thank you for your consideration of these comments.

J04

Sincerely,



David Waller

DW:bd

A-129

NUREG-1437, Supplement 4

LETTER K

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January 24, 2001
sent via certified mail

David L. Meyer, Chief
Rules and Directives Branch
Division of Administrative Services
Mail Stop T 6 D 59
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-001

RE: Draft Supplement to the General Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 4, Regarding the Edwin I. Hatch Nuclear Plant, Units 1 & 2 [Draft NUREG-1437, Supplement 4]

COMMENTS OF GEORGIANS FOR CLEAN ENERGY

The following comments are filed by Georgians for Clean Energy as part of the Environmental Impact Statement process for the License Renewal Application for Edwin I. Hatch Nuclear Reactors I and II by the Southern Nuclear Operating Company and others. The comments herein are a supplement to oral comments made by Sara Barczak, December 12, 2000, before the NRC in Vidalia, Georgia.

Georgians for Clean Energy is a non-profit conservation and energy consumer organization headquartered in Atlanta with a field office located in Savannah. We are a statewide organization with members throughout Georgia and have focused on energy and nuclear concerns for 17 years.

Evaluation Concerns

Georgians for Clean Energy, formerly known as Campaign for a Prosperous Georgia, has been involved in the Hatch relicensing process since it began. We are struck by the broadly insufficient review the Nuclear Regulatory Commission (NRC) conducted in producing Supplement 4 for the draft Generic Environmental Impact Statement (GEIS). Therefore, we resubmit herein all of our past comments and request that these be reviewed again. The following can be found as attachments:

- Attachment 1--CPG Comments on Environmental Impact Statement Application--6-9-2000
- Attachment 2--2.206 Petition Filing by CPG--2-22-00

Appendix A

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species. It is unsatisfactory for the environmental review panel to not be familiar with this simple fact. Additionally, it appeared that the task leader was surprisingly unfamiliar with this environmental review—particularly the site-specific concerns that citizens raised during the meeting despite how some of these concerns were being raised for the second or third time. We were told at the meeting that local “experts” were consulted, though in Appendix B it is readily apparent that specialists with knowledge of the Southeast’s unique geology, hydrology, and ecology are nowhere to be found. We ask the NRC to conduct thorough site-specific analyses using recent data and information, to contact local or regional organizations and specialists, and to fully address our and others concerns with properly documented information easily accessible to the public.

Additionally, it is of overall concern that many of the studies used to support the belief that relicensing the plant will not cause any damage are extremely dated. Many of them were conducted in the mid to late 1970s. Many conditions have changed since then—and many, especially in relation to water supplies, have worsened. A review of the most recent studies is imperative. If there are not updated studies available, it seems equally imperative that they be done prior to the NRC submitting a final GEIS.

During the review of the Environmental Impact of Postulated Accidents, it was apparent that this region is looked at as no more than a number within a massive file of other numbers. Though Mr. Snodderly attempted to present clear information, his numbers and equations raised questions about their relevance in addressing our concerns. The audience in Vidalia was told that if the cost of a Severe Accident Mitigation Alternative (SAMA) is greater than the \$500,000 cost associated with the maximum potential risk benefit, it is dropped from review. This is further confirmed on page 5-12 of the draft GEIS. We are concerned that this method is flawed.

After seeing this approach continually applied when assessing SAMAs, we have become increasingly concerned that the safety of the public and the environment is not of paramount concern to the NRC. This concern is dramatically highlighted on page 5-4 of the draft GEIS when the NRC requested additional information from Southern Nuclear Operating Company regarding how they identified potential SAMAs. The company’s responses “addressed the staff’s concerns and reaffirmed that none of the remaining SAMAs would be cost-beneficial.” This dialogue should have been published in the draft GEIS and we request that the NRC make those documents publicly available. It is apparent that financial costs to the plant owners are more important than the health and safety of the region. Though the NRC does not consider the chances of a meltdown or a catastrophic release to the environment as “credible” they do deem them as “possible.” We ask the NRC to address the impacts of a meltdown and catastrophic releases to the environment, provide the information to us, and include them in the GEIS. 1

1 As a further example of our concerns, regarding the NRC’s approach to SAMAs, the NRC’s panel did not seem to be aware of a recent, regional controversial issue that also revolved around financial costs to the plant owners instead of the costs borne by the local environment. The Southern Company successfully urged the Army Corps of Engineers to drain

Additionally, we request that the NRC review our oral comments again. Comments from the NRC meeting in Vidalia, Georgia made by Rita Kilpatrick on May 10, 2000 can be accessed at <http://www.nrc.gov/NRC/REACTOR/LR/HATCH/transcript1.htm> for the afternoon session and <http://www.nrc.gov/NRC/REACTOR/LR/HATCH/transcript2.htm> for the evening session. Comments made by Sara Barczak at the December 12, 2000 meeting in Vidalia, GA have not yet been posted to the NRC’s License Renewal site but a link to that meeting will likely be found at <http://www.nrc.gov/NRC/PUBLIC/LR/scopingmtg.html>.

Georgians for Clean Energy finds that the GEIS process thus far does not allow for a site-specific analysis of the actual impacts of relicensing. Many organizations, including ours, object to this generic evaluation because it overlooks major site-specific problems. This fundamental flaw in regulatory oversight is glaringly apparent in the Hatch draft GEIS. Many of our and other organizations’ site-specific concerns appear to not have been addressed in the draft GEIS, assumingly due in part to the generic assessment process. Georgians for Clean Energy took the time to thoroughly investigate our comments on behalf of the public interest and request that our concerns be properly addressed and incorporated into the final GEIS.

Given how the Hatch draft GEIS is organized, it is impossible to tell if a specific comment made by others or ourselves was ever considered or addressed. For example, Appendix C lists the correspondence the NRC received from various citizens and organizations. It does not provide the comments themselves and, in particular cases, the NRC’s responses. Though these documents should be available from the NRC’s Public Document Room or ADAMS, both are time-consuming, cumbersome and at times, cost-prohibitive pursuits. What results is a document that appears to have completely dismissed valid, site-specific comments.

Comments on December 12, 2000 NRC Meeting

Georgians for Clean Energy attended the NRC’s public meeting and saw that many questions posed by the public were not adequately answered. In many cases, questions were asked and no one on the task team could provide an answer. We are awaiting information from the NRC as to how or where those questions will be answered. Currently, concerned organizations and citizens have no way of knowing whether or not their questions were ever answered.

The Environmental Review presentation led by Task Leader Mary Ann Parkhurst was especially troubling and raised many new concerns surrounding the inadequacy of the NRC’s review. Due to poor weather conditions, the aquatic ecology expert was unable to attend the meeting. No one present could satisfactorily answer many of the public’s questions that pertained to one of our most significant concerns—Hatch’s impact on the aquatic ecology and hydrology of the region. At one point, when the review of the site’s impact on our aquatic species was summarized, a comment was made about generic “seafood” in this region. Evidently Ms. Parkhurst did not really know what types of species are present. This region has many types of “seafood” that are eaten by a vast number of locals and tourists throughout the year, not to mention other predatory

Area of Vital Ecological Significance

The relicensing of Hatch nuclear plant has and will continue to negatively impact Georgia's largest river, the Altamaha, which is also the second largest river basin in the eastern United States. For that fact alone, special attention needs to be placed on properly analyzing this ecosystem. In previous comments, Georgians for Clean Energy listed several past releases of contamination into the environment that have detrimentally impacted the region. The NRC should review the entire docket prior to issuing a final GEIS for the plant. Hatch nuclear plant is located in Appling County along the banks of the Altamaha River—an area of vital ecological significance to Georgia and the region. The livelihood of hundreds of thousands of people depends on this river and billions of dollars of resources from fisheries, agriculture, tourism, and other coastal activities are at stake here.

A full review of the most recent studies pertaining to the region's ecology, including all flora and fauna, is extremely important, which requires site visits by the NRC staff to the affected region, not just to the site of the plant. Meeting with locally informed specialists and non-governmental organizations would provide much needed perspectives beyond the ones presented in the draft GEIS. Appendix D indicates that not one regional environmental or conservation group was contacted. Additionally, the state agencies contacted are not specialists in nuclear power related discharges or related environmental activities.

Aquatic Impacts / Concerns

Had specialized organizations been contacted, the NRC review panel would have been alerted to the fact that the robust redhorse, a big-river fish, was inaccurately considered to be extinct in the 1970s and is currently present. Therefore, a review of the impacts of relicensing on this species should have been done in the draft GEIS. Though the fish is currently not a federally listed species, there is concern as to why that designation has not occurred. The NRC review team should investigate these concerns by contacting the Georgian Department of Natural Resources (GADNR) Wildlife Resources Division and the Fish and Wildlife Service, among other agencies, to research their efforts to update lists of threatened and endangered species at both the state and federal levels.

Many concerns about the shortnose sturgeon, a federally endangered aquatic species found near the plant, have still not been properly addressed. The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) voiced written concerns as well—including concerns

billions of gallons of water from reservoirs to increase the water levels in the Chattahoochee River so that they could float barges large enough to deliver new steam generators to their aging nuclear Plant Farley just across the Georgia border in Alabama. If the generators could not be delivered by barge, it was estimated that delivering the generators in another way could cost the company more than \$500,000. Yet, though this region of the country is experiencing a severe drought, costs to the company were considered more important than costs to the environment and the region's drinking water supply.

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over the freshwater mussel and the flatwoods salamander. The draft GEIS fails to present the public with important information documenting the correspondence that occurred between the numerous agencies and industry representatives. From the draft GEIS, it is not clear whether or not the NMFS has yet concurred with the NRC staff's assertion that the license extension will not impact the sturgeon population. Nor is it clear regarding the dialogue that ensued as to whether other species have been determined not to be impacted either.

K17

In Appendix E, the NRC states that the potential additional twenty years of plant operation at Hatch "may affect, but is not likely to adversely affect, the shortnose sturgeon." Does that statement imply that the plant could somehow positively affect the sturgeon? This possibility is highly doubtful. The analysis provided does not clearly state how the species would or would not be impacted. Specifically, the impingement samples listed in Table 2-2 were collected from 1975-1980 and were used by the NRC in this draft GEIS to provide a characterization of the fish of the Altamaha River and vicinity (Section 2.2.5). The region has changed drastically since then. Those numbers do not accurately reflect current conditions in the area—especially the extreme drought situation that has continued over the past years. Using such old data affects all the listed species; therefore, this is not just a concern for the sturgeon. Also, many of the studies referenced in Appendix E are out-dated as well. Most of the recent studies were not conducted on the Altamaha, but rather were studies commissioned for the shortnose sturgeon population found in the Hudson River in New York. Georgians for Clean Energy is interested in knowing why more recent studies of the Altamaha were not commissioned. Furthermore, Georgia Environmental Protection Division (GAEPD) readings 2-10X above background levels of cobalt-60, zinc-65, manganese-54, and cesium-137 were found in river sediment, in some cases up to 100 miles downstream. Given that the sturgeon is a bottom feeder, why hasn't a study been commissioned for the NRC on the Altamaha sturgeon population to determine whether or not these levels impact the species? The species has declined over the decades and this document fails to prove that plant Hatch operations have not contributed to this decrease.

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The study on the sturgeon listed in Appendix E of the draft GEIS suggests that the temperature conditions for the reproductive success of the sturgeon is very important. Plant Hatch currently does not have a maximum discharge temperature requirement with the GAEPD. Maximum discharge temperatures within the mixing box have been reported at 94 F in the summer. It is possible that the discharge temperatures, along with the severe drought conditions, among other factors, could negatively impact the sturgeon. We demand the NRC to conduct new, independent studies for the sturgeon population in the Altamaha. Additionally, Plant Hatch's National Pollutant Discharge Elimination System permit is due to expire in 2003. NPDES permits do not address radioactive effluents but the NRC should review potential future NPDES discharge temperature limits to more effectively gauge whether the plant can comply with state and federal requirements.

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Furthermore, plant Hatch is the largest permitted water user on the Altamaha River. The draft GEIS inaccurately states that they are permitted to consume a monthly average of up to 72 million gallons per day with a maximum 24-hour rate of up to 104 million gpd. The Surface Water Withdrawal Permit was amended in April 2000 to increase the monthly average to 85 million gpd with the maximum daily use remaining the same. This permit will expire in 2010. The NRC should update this recent change and contact the GADNR Water Resources Division to investigate future permitting concerns especially in light of the current, sustained drought that this region is experiencing.

As mentioned earlier, the data on the impingement samples are extremely old. Georgians for Clean Energy does not believe that more than twenty-year-old data is reliable to use in order to project future impacts for the region thirty years from now. For instance, the most frequently recovered species listed in the impingement data was the hog choker, a freshwater flounder. Since then, the Altamaha has experienced a wide spread invasion by the non-native flathead catfish and the hog choker has not been as widely seen. In the 1997-99 GADNR Environmental Protection Division's Environmental Radiation Surveillance Report, only one flounder sample was measured, while ten catfish were sampled, out of a total of seventeen samples. Though the EPD report does not explain sampling methodology, this uneven "catch" should raise concerns within the NRC regarding the use of such old sampling data when reviewing the license renewal. The EPD report is only a surveillance study and does not address the biological impacts of radiation within the region's ecosystem.

Terrestrial Impacts / Concerns

A significant number of federally and state-listed endangered terrestrial animal and plant species are found at the Hatch site or within the transmission line rights-of-way (Tables 2-3, 2-4, 2-5). The draft GEIS fails to provide the specific results of the field surveys that Southern Nuclear Operating Company commissioned of the region so it is unclear as to when the sampling occurred, what was sampled, and who conducted them—a reference citation suggests 1998 but it is unclear if that study pertains only to the freshwater mussels in the area. Similarly, the gopher tortoise data appears to be from 1987. Additionally, where can the recent analysis of the bird populations be found? This lack of specificity in NRC reporting is unacceptable. Species of plants, reptiles, amphibians, birds, and mammals were listed in those tables. The draft GEIS fails to document how the NRC assessed that an additional twenty years of plant operation, beyond the current license expiration dates of 2014 and 2018, would have little to no impact on these species. It is unclear as to what agencies specifically were asked to provide comment on the potential future impacts on these species. For instance, correspondence between GADNR, FWS, and NMFS occurred, but what species were they addressing? Did they assess all the species listed or just those overseen by their agencies? How can this assessment be properly reviewed if a full review by knowledgeable organizations and governmental agencies have not been involved in the initial review and resulting correspondence? For example, it appears that the GADNR's Non-

Game/Heritage Program was contacted and they do indeed have expertise in this area. But were they asked to comment just on the mussel study that was completed in 1998?

The analysis of various species of mussels that are found along the Altamaha is not mentioned in the draft GEIS yet public comments have been raised about several endemic species. Several species have lessened in their frequency downstream of plant Hatch. How has plant Hatch been ruled out as not partially contributing to that decline? Furthermore, the Altamaha spiny mussel likely will be recommended to add to the state's list of concerned species and may also be a candidate for federal listing. These designations could occur after plant Hatch receives a license renewal. With this information, how can the NRC confidently predict that the continued and extended operation of this plant will not impact this species? Other species of plants, birds, animals, reptiles, amphibians, or aquatic organisms could change their listing status as well and it is not clear that the NRC looked at future listing changes. Yet, it can somehow be predicted that the plant itself will not impact the region's future ecosystem even though the draft GEIS is lacking a future projection of what the region may be like. We ask the NRC to meet with the GADNR, FWS, and the NMFS to discuss changes that may be made to threatened and endangered species lists in order to more accurately assess future impacts of plant Hatch on these organisms. Additionally, these agencies should receive copies of all the inspection reports, violations, and past contaminations to the river, the nearby wetlands, and the site itself that have occurred from the docket so they can see how plant Hatch has negatively affected the environment.

Air Quality Impacts / Concerns

On page 2-21 the draft GEIS incorrectly states "HNP is located on the Altamaha River between Savannah and Macon in western Georgia." Plant Hatch is more accurately in south central Georgia, definitely more east than west. Additionally, Hatch is southwest of Savannah and is along the Altamaha between Macon, where one of the Altamaha's headwater sources is, the Ocmulgee, and Darien, where the mouth of the Altamaha is found, not Savannah. The NRC review staff is obviously not familiar even with the location of the plant.

The closest non-attainment area is soon to be Macon since Georgia's Governor Barnes has alerted the EPA that Macon, Columbus, and Augusta have violated the new ozone ambient air quality standards. The EPA will likely designate Macon as a non-attainment area based on the old 1-hour ozone standard in the near future. Though Savannah has not yet violated the ozone standard it has come close and may do so in the future. If it does, this could potentially affect surrounding areas, including Hatch. The draft GEIS analysis is lacking crucial, current information in assessing Hatch's impact on the region's air quality.

Furthermore, there is significant concern over the emissions from the plant's cooling towers. A tremendous amount of water is lost every day in the form of radioactive water vapor from the towers. The draft GEIS states that plant Hatch consumes an average of 33 million gallons of water per day. Fine particulate matter would be suspended in that water vapor and carried

through the air to be deposited elsewhere within the region. Given Plant Hatch's daily water vapor losses, these numbers could be significant and may qualify the plant as a major source and should be assessed under the federal Prevention of Significant Deterioration program specifically in reference to its PM-10 emissions. It is not clear if Plant Hatch's Title V permit properly assessed whether or not the cooling towers should be added as a source—currently they are not. The permit will expire in February 2004 and therefore the NRC should consider future amendments. Additionally, there are mercury advisories for various fish species in the Altamaha. Depending on the levels of mercury present in the river water, mercury could also be present in the water vapor, and though not currently listed as a criteria pollutant, it may be in the future. An assessment of the Altamaha's water quality should be conducted in order to properly determine the towers' possible emissions. Additionally, radioactive decay products coming from the cooling towers decay to, for example, cesium-137 and strontium-90, which contaminate the surrounding populations and ecology. Georgians for Clean Energy demands that the NRC review staff thoroughly review these concerns before granting the license renewal.

Impacts of Uranium Fuel Cycle

On page 6-7, under "Onsite spent fuel", the NRC found: "The expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated on site with small environmental effects through dry or pool storage at all plants if a permanent repository or monitored retrievable storage is not available." At the public meeting on December 12, 2000 in Vidalia, Georgia, the NRC staff made statements that were somewhat confusing when asked about this subject. Does the draft GEIS address the site's Independent Spent Fuel Storage Installation (ISFSI). If not, why not, as it directly affects the environmental impact of plant Hatch operations – now and in any relicensed future? The ISFSI is storing "onsite spent fuel" so it seems reasonable that the impacts should be addressed.

Is it the NRC's assessment that if a permanent repository or monitored retrievable storage is not available in the future then it will be acceptable to continue storing waste at plant Hatch? Does this mean that on-site storage of highly radioactive waste at plant Hatch could permanently remain on the outdoor cement storage slab, the ISFSI? How can the long-term environmental effects of dry cask storage at Hatch be known at this time when the first three casks, casks that have never before been used at any other nuclear plant, were just loaded this summer? How is it possible to know that the casks will not impact the environment more than thirty years from now? The generation of highly radioactive waste is an unavoidable result of nuclear power generation. According to the relicensing application, plant Hatch will generate 5000 more radioactive spent fuel assemblies (as each assembly contains 60 spent fuel rods, that equals 300,000 additional spent fuel rods). It is imperative that a proper analysis of the facility's waste generation and how that future generation will impact the surrounding community and regional ecosystems be included in the final GEIS. We request that the NRC answer these questions and add the ISFSI and its projected future impact on the region into the scope of the license renewal review.

Inadequate Analysis of Alternatives

The NRC staff analysis of alternatives considers merely one combined option: replacing plant Hatch with gas plants and energy efficiency. This analysis does not consider a more robust mix of natural gas, purchase power from non-utility generation, energy-efficiency, and distributed generation technologies.

Nor does it adequately compare alternatives over the life cycle of Plant Hatch and the subsequent storage of spent fuel. Plant Hatch's current license assumes retirement in 2014 and 2018. These dates are approximately 13 and 17 years away. NRC staff analysis fails to consider technological changes in the maturation of generation technology such as fuel cells and solar photovoltaic that may occur in the coming decade, as well as other opportunities with environmentally sound biomass options.

Considering that the most recent long-range Integrated Resource Plan for Georgia Power Company, approved by the Georgia Public Service Commission, identifies ways that the company plans to secure power supplies in the long term based on future, projected demand and assumes that Hatch is not relicensed, it is clear that the analysis of alternatives along the planning horizon is inadequate.

Georgians for Clean Energy holds that the application and the NRC staff analysis fail to consider the ability of renewable energy supplies in combination with energy efficiency and cleaner generation (fuel cells, cogeneration, micro turbines, high efficiency gas, bio-fuels, etc.) to make a major, low cost impact on the applicant's high polluting and unsafe generation profile.

In the summer of 2000, the severe drought in Georgia forced Georgia Power Company to purchase peak priced electricity – almost \$100 million dollars worth that was not planned. Money spent on these "band-aid" supply-side solutions does not return any value to company customers. Had the money been invested in distributed resources and peak-clipping technology, a return would have been realized for many years beyond the summer of 2000. Short-sighted planning such as this and the inadequate review of alternatives presented in the application fail to provide value to consumers and to protect the environment.

Regarding market-based, renewable energy programs, Georgians for Clean Energy urges that the Southern Company and its partners continue working with our organization, the renewable energy industry, and the Center for Resource Solutions, a voluntary certification program that requires utility participants to follow specific guidelines that promote renewable resources to offer clean renewable resources to its customers. We request the NRC to review the Integrated Resource Plan mentioned above and to re-evaluate alternative energy options for this region.

LETTER L



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February 6, 2001

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Division of Administrative Services
Mailstop T 6 D59
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

RE: EPA Review and Comments on
Draft Generic Environmental Impact Statement (GEIS) for
License Renewal of Nuclear Plants, Supplement 4
Edwin I. Hatch Nuclear Plant, Units 1 and 2
Draft NUREG 1437
Appling County, Georgia
CEQ No. 000380

Dear Sir/Madam:

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the document entitled "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding the Edwin I. Hatch Plant, Units 1 and 2", Draft Report for Comment, NUREG-1437 (Draft GEIS). This document provided information to educate the public on general and project specific environmental impacts and analysis procedures, and allowed the public review and disclosure aspects of the NEPA process. The purpose of this letter is to provide the Nuclear Regulatory Commission (NRC) with EPA's comments regarding concerns of potential impacts of the renewal of the Edwin I. Hatch Nuclear Plant (Plant Hatch) Operating License. In addition, EPA has received correspondence from concerned citizens who have voiced their concerns over the Plant Hatch relicensing.

Plant Hatch is a nuclear power electric generating facility that has process water discharges regulated by the National Pollutant Discharge Elimination System (NPDES) program which provides effluent guidelines for the steam electric generating category, including cooling tower blowdown and low volume waste. NPDES programs in the State of Georgia are managed by the Georgia Environmental Protection Division (EPD). According to Georgia EPD, Plant Hatch is in compliance with its NPDES permit, and a recent search of EPA's Permit Compliance System likewise shows no NPDES violations for this facility.

Conclusion

Georgians for Clean Energy maintains that the NRC's history of frequently categorizing problems as generic industry problems is not serving the public interest in the case of plant Hatch's relicensing. We request that the NRC treat all problems and areas of concern raised about Plant Hatch in this re-licensing proceeding and others as "site specific problems," not generic industry problems. Many have been identified in these and previous comments and require further review.

Building a safe, affordable and efficient energy supply that provides safe jobs to the area is a top priority. Georgians for Clean Energy does not believe that the relicensing of Plant Hatch will work towards those goals. Along with the variety of reasons mentioned in these comments and those issued previously, we are opposed to the license renewal of the plant. Extending the life of this decrepit nuclear plant will only ensure the continued degradation of the environment and increase the already high risks to the surrounding population and downstream and downwind communities. We urge the NRC to thoroughly investigate our concerns and those of other organizations and individuals who have raised concerns in the public interest.

Respectfully submitted,

Sara Barczak
Safe Energy Director

Attachments (3)

[The attachments to this letter appear later
in this appendix.]

May 2001

A-135

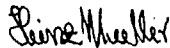
NUREG-1437, Supplement 4

EPA has reviewed correspondence of concerned citizens who have voiced concerns over the relicensing of Plant Hatch. These concerns referenced potential and alleged spills of radioactive materials at the site, and alleged radioactive materials contaminating the environment. While EPA is concerned about these allegations, EPA does not regulate the radioactive components of any waste streams; that is the responsibility of the Nuclear Regulatory Commission (NRC). Regulatory levels of α , β , and γ radioactivity for all waste streams are under the authority of NRC and their state regulatory counterpart. The NRC and its licensee share a common responsibility to protect public health and safety. Therefore, we are forwarding copies of this correspondence to NRC under separate cover, and request that the concerns are thoroughly addressed in the Final EIS.

Based upon the information provided in the Draft GEIS we rate the document "EC-2," that is, there are environmental concerns on some aspects of the proposed project, and more information is needed. Specifically, more information is needed regarding environmental justice, clarification of potential impacts, and on-site groundwater wells. The attached comments detail our concerns regarding the Plant Hatch relicensing.

Thank you for the opportunity to comment on this Draft GEIS. If you have any questions or require more information please contact Ramona McConney of my staff at (404) 562-9615.

Sincerely,



Heinz J. Mueller, Chief
Office of Environmental Assessment

EPA Review and Comments on
Draft Generic Environmental Impact Statement, Supplement 4
Edwin I. Hatch Nuclear Plant, Units 1 and 2
NUREG 1437
Appling County, Georgia
CEQ No. 000380

GENERAL:

Throughout the document, there are references to both a Generic Environmental Impact Statement (GEIS) and a Draft Supplemental Environmental Impact Statement (DSBIS). Clarification of the document format is needed.

L01

There is concern that the plant is exempted from certain regulations, such as the Georgia Coastal Zone Management Act and other local land use and/or zoning restrictions, due to its location. Are these elements being tracked and can the results be quantified?

L02

Submission of all referenced documents would decrease the amount of review time. For example, the Office of Nuclear Reactor Regulation office letter (NRC 1999b).

L08

WATER:

Drinking Water & Underground Injection Control: Information reviewed from the Safe Drinking Water Information System (SDWIS) showed that the plant has not experienced a Safe Drinking Water Act (SDWA) violation since 1993 and no health-based violations or monitoring, reporting, and other violations have been reported. With over four new Rules being promulgated through the SDWA within the next 3-8 years, how will the owners address the impact of these regulations?

L03

There are inconsistencies regarding the number of Drinking Water wells permitted at the site and the associated ID numbers for these wells. In Appendix E, it is stated that the permit authorizes withdrawal from two wells, on pages 2-30 and 2-31, it is stated that there are three wells, and later in the document it is stated that four wells are permitted. There should be consistency in the number of wells operated by the facility.

L04

The Drinking Water ID number of the wells reported in the document were not consistent with the ID number assigned to the facility by the State. Not having the correct information, including the ID numbers, slowed the review process.

ENVIRONMENTAL JUSTICE:

Per Executive Order 12898 (59 FR 7629), Environmental Justice (EJ) is to be considered under NEPA. The document mentions EJ, but on pages 3-3, 4-20, it is stated the EJ was not addressed. More details are needed in order to make an informed assessment and to provide more clarification for information provided. Specifically, page 4-27 presents a list of five parameters that could impact human populations, however, there are no explanations of how these parameters could migrate to impact surrounding areas, nor an

L05
L07

Appendix A

LETTER M



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702
(727) 370-5317, FAX 370-5300

January 29, 2001 F/SER4:PB:am

Chief, Rules and Directives Branch
Division of Administrative Services
(Mailstop T6D39)
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir or Madam:

The National Marine Fisheries Service (NMFS) has reviewed NUREG-1437, Supplement 4 concerning the Generic Environmental Impact Statement for License Renewal of Nuclear Plants; Edwin I. Hatch Nuclear Plant (Hatch Project), Units 1 and 2 (SEIS). The Hatch Project is located on the Altamaha River in Appling County, Georgia. The SEIS was prepared by the U.S. Nuclear Regulatory Commission (NRC) in response to an application by Southern Nuclear Operating Company (Licensee) to renew the operating licenses for the Hatch Project for an additional 20 years.

General Comments:

In general, the document is well written and adequately addresses project-related effects on existing fishery and aquatic resources of the Altamaha River. Based on our review of the SEIS and supporting information, we concur with your staff's determination that the project's effects on diadromous fishery resources are not significant at this time. However, we are concerned that those impacts may become much greater during the license period since impingement and entrainment of adult fish and/or their eggs and larvae are likely to increase. The Altamaha River is currently the focus of cooperative efforts by state and Federal natural resource agencies to protect and restore fishery and other aquatic resources. The river's diadromous fish populations include striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), American eel (*Anguilla rostrata*), Atlantic sturgeon (*Acipenser oxyrinchus*), and the Federally-listed endangered shortnose sturgeon (*Acipenser brevirostrum*). Although populations of these species have been seriously reduced throughout their range, the Altamaha River is continues to support relatively modest numbers of these fish, and may harbor the largest remnant population of shortnose sturgeon south of Cape Hatteras, North Carolina.

M01

explanation of what the potential impacts could be. Clarification and more details are needed.

More information is needed to clarify what is meant by water use conflicts, what the source of potential electric shock is, which microbial organisms are of concern and what their potential impacts are, and more detail on your evaluation of postulated accidents with respect to EJ populations. It is also unclear what environmental pathway some of these parameters would use to impact human populations.

L06

May 2001

A-137

NUREG-1437, Supplement 4

Specific Comments:

Pages 2-22 through 23, Section 2.2.5. This section discusses potential impingement and entrainment of fish. Data used to support the analysis include five (5) years of sampling data that were collected between 1975-1980. The data indicate that low levels of impingement and entrainment of diadromous species life stages occurred during this period. While this may accurately reflect previous and even current conditions, it does not consider the effect of ongoing and future restoration of fish populations. Therefore, this section should be expanded in the final document to address population changes that could occur during the new license term if larger numbers of fish eggs and larvae are present due to restoration efforts.

Page 4-7, Section 4.1, Paragraph 3. This section discusses the environmental impacts of the plant's cooling water system on entrainment of subadult fish. The paragraph refers to the NRC Generic EIS which states: "Entrainment of fish has not been found to be a problem at operating nuclear power plants with this type of cooling system and is not expected to be a problem during the license renewal term." It is further stated that: "The staff has not identified any significant new information during its ...site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of entrainment of fish and shellfish in early life stages with this type cooling system during the renewal term beyond those discussed in the GEIS." This view does not sufficiently consider that significant elevation in entrainment of eggs and larvae of anadromous species, particularly American shad, blueback herring, striped bass, and Atlantic and shortnose sturgeons, is possible as a result of population increases during the license renewal period. Based on experience in other southeastern rivers where diadromous fish restoration efforts have been implemented, it is possible that restoration goals (upstream migration past the Hatch Plant) for anadromous fish species such as American shad could produce more than 250,000 spawners during the license renewal term. The current size of spawners in the Altamaha is not known, but it is likely to increase as management efforts are implemented and changes in water column density of eggs and larvae could be significant. Accordingly, a detailed explanation of these impacts, including mitigative measures that could be implemented, should be provided in the final environmental document for the project.

Summary Comments:

Considering that ongoing and future fishery restoration efforts in the Altamaha River could significantly affect the environmental consequences of operating the power plant, those consequences need to be addressed. The NMFS also believes that the NRC should establish a process for ensuring effective and timely coordination between the NRC, the Licensee, and resource agencies regarding fish impingement and entrainment since further coordination will be needed during the license renewal process. More specifically, the process should address initiation of agency coordination in response to expected changes in fish populations and elevated effects of impingement and entrainment at the Hatch Plant; monitoring and other studies that may be needed; and possible modification of final license conditions as may be needed to restore and sustain fish populations.

Finally, in accordance with the Endangered Species Act of 1973, as amended, it is the responsibility of the appropriate Federal regulatory agency to review its activities and programs and to identify any activity or program that may affect endangered or threatened species and their habitat. If it is determined that these activities may adversely affect any species listed as endangered or threatened, formal consultation with our Protected Resources Division must be initiated. That office may be contacted at the letterhead address, or at (727) 570-5312.

The NMFS looks forward to further coordination with NRC, the Licensee, the Georgia Department of Natural Resources, and the U.S. Fish and Wildlife Service in this matter. Related questions or comments should be directed to the attention of Mr. Prescott Brownell at our Charleston Area Office. He may be reached at 219 Fort Johnson Road, Charleston, South Carolina 29412-9110, or at (843) 762-8591.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

M02

M03

Appendix A

LETTER N

Given at Scoping Meeting

May 10th, 2000

(N)

Statement and Testimony of Pamela Blockey-O'Brien, on behalf of the P.O.R./I.F.O.R (National and International Fellowship of Reconciliation) to the U.S. Nuclear Regulatory Commission, AGAINST the request of Southern Nuclear Operating Company - a subsidiary of The Southern Company - on behalf of itself and co-owner licensees, namely: Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia and the City of Dalton - for a License Renewal under the Atomic Energy Act of 1954 as Amended for Renewed Operating Licenses for Nuclear Power Plants Edwin I. Hatch Units I and II, Dockets Number 50-321 and 50-366, located on the banks of the Altamaha River, in Appling County, Georgia, with the Application for License Renewal dated February 2000. The Application is 1200 pages according to NRC, the pages are divided in sections and numbered according to section. After some difficulty I recieved a copy last week. Since then every waking moment (and in my nightmares) I have been going over this Application - an Application, by the way, that reminds one of a crooked used car salesman trying to sell a junk vehicle without disclosing too much about the bomb s on board, the ingredients in the bombs, that some of the ingredients are released to the environment as the vehicle travels and that the engine block is more or less held together with baling wire and spit balls.

It saddens me to have to come to a community held hostage by the fact that around 70% of its tax base comes from a radioactive hulk which threatens their existance by its mere presence, with a high level radioactive waste dump inside it and another one being created outside it, the contents of which will be radioactive essentially for eternity. When the Georgia Power Company teamed up with the Georgia Institute of Technology and the forerunner of the Nuclear Regulatory Commission and forerunner of the Department of Energy, namely the Atomic Energy Commission and brought a research reactor to Georgia Tech on which to train reactor operators so the South could be nuclearized with power plants, you can bet your stock options that few were told the ultimate consequences, just like today. So let us examine the truth;

Just as in a nuclear bomb, inside a nuclear power reactor such as Hatch, the atom is split, or "fissioned" releasing incredible energy, but inside a reactor, with luck, the nuclear reaction is "controlled" and can be stopped. Water is hauled out of the Altamaha River, forced between the hundreds and hundreds of fuel rods containing enriched uranium, the rods grouped in bundles called assemblies, as the atom is split, the water is simultaneously cooling the rods so they don't melt-down, and generating steam to power turbines for generators for electricity. In the process, more than eighty different possible radioactive "split" products, called "fission products" are formed, capable of releasing ionizing radiation, X-Rays, alpha and beta particles, gamma rays or neutrons. For example, Xenon-137 is created which gives off (negative) beta radiation which becomes cesium-137, which gives off gamma radiation. "Activation products" are also created, the violence of the nuclear chain reaction causes existing chemicals in air, water, nearby materials etc. to absorb energy change structure and become radioactive. Approx. 300 different radioactive chemicals created, must then go through many half-lives as they decay back to their natural stable state, all the while emitting radiation. Radioactive particles created decay into other radioactive so-called "daughter products". During the process plutonium is also created in the fuel rods, along with other radioactive "goodies" like Cobalt-60, Cesium-137 and Strontium-90. When there are insufficient atoms left inside the uranium in the fuel to split to maintain a steady power state, rods are said to be "used" or called "spent fuel". The

FWS, Athens
EPA, Atlanta
GA DNR, Social Circle
SAFMC
F/SER3
PSP - Schreiber

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rods in their assemblies are now the most radioactive thing on the face of the earth more or less, besides an atomic bomb explosion. They are removed from the reactor core underwater for shielding against the incredible radioactive decay heat coming off them and stuck in a pool of water, which is an inside radioactive dump, to sit there forever and forever until someone, somewhere goes one better than The Creator and changes the laws of physics, energy, matter etc. and can render nuclear waste safe. According to information provided me, as of last Nov. Hatch had approximately 302,008 radioactive rods in the pool and 69,440 in the combined cores of Hatch I and II. The Brookhaven Study done for NRC in 1997 regarding radioactive spent fuel estimated a worst case scenario, full pool at a BWR, of 138,000 dead after one year in a 500 mile radius and 2,170 square miles of contaminated land in event of accident, in the pool. The pool is located between the fourth and fifth floor level approx. It is patched because they already dropped a bolt weighing hundreds of pounds into it, ruptured the liner and contaminated the hell out of the place, and have had leaking fuel in reports, yet Southern does not seem to mention this or discuss it under Severe Accident Mitigation Alternatives or under Aging Effects regarding the pool, except to discuss water chemistry, when it is known that radiation degrades the cement, steel etc. alloys etc. and causes all types of corrosion, irradiation embrittlement, pitting, and a host of problems they even admit to in the application, for everything at the plants from the reactor to the fuel, pool, and everything involved from the ground up. The CRAC-2 Report to Congress back in the early 1980's concerning a core melt at Hatch and releases would cause hundreds of dead per Unit, thousands of injuries and up to \$56 Billion in damages-causing radiation injury over a 70 mile radius. It would be the death of middle and south Georgia, due to high groundwater the core melt would hit the Altamaha faster than Southern's executives could leave the State. If it happened at a time when the Altamaha's flow was high, as in 1998/94/95, when in some months it ranged between around 45,000 cubic feet a second to around 70,000 cubic feet a second at the Doctortown gauge south of the plant by some miles according to USGS documents, or the December 1948 flood in the applicants own documents of 130,000 cubic feet a second north of the site, it wouldn't take too long to reach Georgia's prime fishing and tourism area, the Golden Isles and the Atlantic. Yet Southern has the absolute gall to state that the offsite economic cost would be \$99,659, and the offsite exposure cost \$72,565 and also that quote: "As the environmental impacts of potential severe accidents are of small significance and because additional measures to reduce such impacts would not be justified from a public health perspective risk

Southern Nuclear Company concludes that no additional severe accident mitigation alternative measures beyond those already implemented during the current license term are warranted. For RHP."

Southern modelled all releases, except one only, at ground level, buoyant plume rise was not modelled. They used ONE years worth of site meteorology, instead of 30 year wind roses offsite, onsite meteorology since startup, precipitation and temperature from Georgia records going back a minimum of 180 years, because this information is vital under accident conditions as NRC well knows and needed for daily use - but hey, Georgia Powers Annual Report on Plant Radioactive Effluent Releases for 1996, a report that must be submitted because all nuclear power plants constantly release radioactive contaminants to the environment in order to operate, with subsequent uptake to crops, water, fish, sediment, children, people in general for miles I'll get to later on, Georgia Power told the NRC in writing that they were not submitting it they had it on file and would supply it on NRC request

3.

Hatch is A General Electric Mark I, its a lemon. the 1975 GE so-called "Reed Report" detailed major safety and economic problems with their reactors. Even earlier when the NRC was still the Atomic Energy Commission, your own top staff wanted to ban reactors of the Hatch type because THEY HAVE NO PROPER CONTAINMENT DOME AT ALL and their pressure suppression system using a Torus and a piddling containment chamber could lead to disaster, and as late as 1987 NRC confirmed, their pathetic system was virtually certain to fail in a major accident. Hatch has known drywell leakage and you better read all the PNO's and Licensee Event Report on the Torus since startup all about leaking valves, torus water temperature reaching 97 degrees caused (they Docket says) by continuous hot weather increasing the temperature around the reactor building, faulty wiring and a crack in the vent header and the like. To top it off, the reactors for Unit I has a cracked core shroud held together by metal braces which could fail due to embrittlement and vibration.

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But I want to get to serious environmental issues, concerning the active contamination of the environment around Hatch and the contaminated sediment in the Altamaha down to the coast at Darien thanks to this dump. As NRC knows, A Curie is a measurement of radiation standardized to radium. One Curie gives off thirty seven billion macroscopic nuclear explosions a second, euphemistically called "disintegrations" or "transformations", for comparison, radioactive contamination in the environment is measured in microCurie and Pico Curie levels, usually in the last. It is also measured in millirems. The State of Georgia maintained until very recently in their Environmental Radiation Surveillance Reports, that average so-called background radiation in Georgia was 40-42 millirem a year- we all know that fallout from past nuclear tests now contributes only one millirem a year, though DOE and NRC (and now the State by the look of it) have been increasing it for years to suit their purposes, saying its "background" when most of it comes from the nuclear fuel cycle and related activities such as emissions from nuclear facilities. Allowable release levels were set, historically, in order to allow quote "reasonable latitude for the expansion of atomic energy programs in the foreseeable future." The purpose of NRC Regulations, is ONLY to make sure the standards for protection NRC came up with in their Part 20 Regulations, as the regulation says. NRC (and DOE) set the standard to operate, industry must not go above those standards. It has nothing to do with health or environmental protection or worker protection. Neither NRC nor DOE gives a fig about the workers. Because radiation can't be seen, smelled, etc. tortured mathematical formulas were invented to try and figure out the cell damaging effects, which are immediate and essentially irreversible according to the best medical specialists in the world specializing in radiation, and I do not mean the appalling ICRP who set permissible genetic doses to sperm and ovum. According to the governments own documents, radiation damages the genetic material in reproductive cells and results in mutations transmitted from generation to generation. There is no "safe" dose below which there is no damage, this has now been conclusively proven for the umpteenth time. In the environment the effects are cumulative. It bioaccumulates up the food chain. Emissions from reactors, such as Hatch, are poured out the stacks as "Noble gases" seep out of myriad minute openings in the system, and are dumped back to water. For this reason measurements are taken - yet the true effects measurable in blood tests to the population and the animals, and assessment of individual mutations and chromosomal aberration is not done, and it should be. For Southern to be saying that there are no water quality issues in the vicinity of Hatch with the river, that the quality of the groundwater in the vicinity of Hatch is good,

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is disgusting, but predictable. Among other things, they contaminated the groundwater at Hatch beginning in 1979, the aquifer to be precise, then in 1982 150,000 gallons of riverwater flooded the turbine and radioactive waste buildings which will have also seeped into the ground water which discharges ultimately to the Altamaha, or could also seep into the other aquifers. In 1986 there was a spent fuel pool accident where 141,500 gallons of water highly contaminated with Cobalt-60, zinc-65, Manganese 54, Cesium-134, Cesium-137, Tritium. Back in 1979, Cs-137 was still below 20 pCi/kg in sediment, it has since hit 67,000 pCi/kg, - fish, a year after the '86 spill contained Cs-137 up to 750 pCi/kg. In 1999 river sediment in published reports still hit 380 pCi/kg dry, the cobalt-60 in sediment in 1998 still hit 190 pCi/kg 4 miles downstream and the K-40 14,000 pCi/kg. The Beryllium-7 which Georgia Power admitted to me of course comes from the reactor and it goes up and down like yo-yo in vegetation - 10,600 pCi/kg in '97, as does the Cesium-137 for example in '97 it hit 473 pCi/kg vegetation 10 miles south of the plant which even though it's one of the wind State calls it background - but then, as I explained to the Atomic Safety and Licensing Board Judges how the State operates back in '96 that's no huge surprise either. You need to impound and read every test ever done at the Georgia Tech Lab for the State, the State files and the Utilities records since startup. Not to mention every inspection report the NRC wrote since start-up and violation and so-called non-cited violation, for starters to begin to get the picture, bearing in mind that the Hatch offsite Dose Calculation Manual and Final Safety Analysis Report were written in the stone Age and are outrageous. For example, the ODCM says gaseous radioactive releases at and beyond the site boundary can go to 500 millirems a year to the body and 3,000 mRems a year to the skin for noble gases, and then say they have no limits on the noble gases they can release, and that, for radioactive iodine -131 and 133, tritium (radioactive hydrogen) and all radionuclides in particulate form with half-lives greater than 8 days, up to 1500 millirem to ANY organ, all of the aforementioned as dose rate limits, this is worse than absurd. They say (under ODCM Methodology in their '96 report) that the percent of the ODCM limits are not applicable because they have no Curie limits for gaseous releases. This is the outfit that uses what they term "hypothetical" children as their controlling receptor for the releases, in actuality their own words was "a child in the NW quadrant" if I remember correctly - This is the outfit busy dosing the children and adults at the Rosside Park, the Camping Area, the Recreation Area and the Visitors Center. This is the outfit dosing the Boy Scouts in that camping area according to their own manual. I don't care how low a dose they maintain the kids are getting from the noble gases or particulates, if the Strontium 90, being a calcium displacer lodges in the kids bone and gives it bone cancer, both child and parent don't ask how little did it get. Strontium-90 decays to Yttrium-90, which is known to concentrate in the hormone producing soft-tissue organs such as the ovaries, testes and pituitary gland, and, according to published reports by the radiation medicine community is a powerful hormone disrupting radioactive chemical not just a powerful carcinogen. Southern is permitted by Georgia to withdraw a monthly average of 72 Million gallons of water a day with a maximum rate of 103.6 mgd. Georgia must have lost its mind to permit this. The annual average is 57.18 million gallons a day, they say consumptive losses approximate 46%. Translated into "people-speak" that includes the evaporating radioactive steam etc. "losses to the atmosphere"

as they so cutely put it. They say the withdrawal to the alluvial

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aquifer recharge is small in impact. That the recharge is also provided by the minor confined aquifer of the Hawthorn Formation to which the alluvium is interconnected. First the Hawthorn is not minor, Hatch sits on top of it as well as the alluvium which is under and on both sides of the Altamaha and the Hawthorn continues on the other side according to the DOE survey of the site and as it is all interconnected and they contaminated the aquifer onsite and so forth the extent of the effects could be massive. Furthermore, a comparison of the DOE survey of soil sample data in the area from long ago, with what has been measured since regarding K-40 and Cesium-137 data, -even though the DOE lies and says Cesium-137 is natural, when its man-made, and the plant had been operating a short while and releasing radioactive crud, -shows that the area has been contaminated. For example, most K-40 was zero, and the Cesium-137 never went over 310 pCi/kg in soil. K-40 was at 1600 pCi/kg in soil in '99 in one measurement and 6300 pCi/kg in an '88 measurement for comparison, and 3,500 pCi/kg in '84. Cs-137 in soil in '98 in State data provided (which may not be all data-knowing them) reached 240 pCi/kg, in '88 640 pCi/kg and in '84 920 pCi/kg. nrc's attitude has been so well, it's lower now. Site geology is actually extremely complex, and, as Hatch also withdraws 1.1 million gallons a day average from the Floridan aquifer also

monthly beneath the site, for, among other things "process use" such as demineralized water, which is of course used using a huge amount of water when calculated over just one year. Georgia, Alabama and Florida are currently engaged in what is termed "water wars" over their water needs, and those needs do not only cover river withdrawals, I don't think. Water issues are among the biggest issues environmentally worldwide and nationwide and are becoming critical, due to the type of pollution from facilities like Hatch, not only other pollution sources. Farmers also rely on this system. At least their needs should take precedence over the needs of a local polluter that could and should have utilized alternative energy years ago. The Applicant's go into rhapsodies about the ecology of the site, including the wetlands that they contaminated with the spent-fuel pool spill disaster. They neglect to mention that it has been documented for over 40 years that mammals and birds waterfowl etc. are contaminated via ingestion of contaminated seeds, berries and other foods contaminated by nuclear emissions and direct radiation from the facilities and that contamination affects their reproduction, health and is also accumulated in their bones. Migratory species carry the contamination with them. When they die, if ingested by something else, that also becomes contaminated and so it continues. The radioactive iodine from Hatch is measured in the milk in the Tattnall Co dairy, as is the Cs-137 and tritium and strontiums due to uptake via the grass/cow/milk/child pathway. It used to be measured at Appling and Toombs dairies also, which it should be, maybe it still is and I don't have the data. According to NRC and the State, both partly funded by the licensee, the nuclear industry, the attitude is all this is OK, within the levels, remember. A '94 milk sample of Hatch's showed 500 pCi/L tritium. Although it has been established since decades that tritium at very low levels is particularly hazardous to the developing fetus EPA set a helpful allowable level in water of 20,000 pCi/L. Tritium irradiates as it passes through the body, continued ingestion means continued irradiation and continued damage. One thing is that I believe the Tattnall Co. Dairy is the massive State Prison dairy, which brings me to another issue: Southern has figured out that everyone is going to do the "radiation stumble" namely, that they are all going to evacuate in case of a severe accident - you know, a meltdown and massive release

N04

to air, going at 2.5 Meters - about 7 feet a second, in a radial distance. The evacuation is only 10 miles under the law, but CHAC-2 says the kill-zone is 20 miles. First responders are of course the local fire department and little, cute Appling Co. Emergency headquarters people. Anybody told them that if they try and go in under such circumstances they'll die? Is Southern/Georgia Power going to evacuate the workers, school children, shut-ins, prison guards and prisoners from the various area prisons, hospitals, nursery school children at 7 feet a second? That dump has had three serious events in the last year, the February event could have led to a meltdown. How many times can you get lucky? I did not even bother to look at the General Electric data submitted - why should they be trusted?

Regarding their NPDES Discharge Permit issued by the State of Georgia under the Clean Water Act to allow discharges to the Altamaha, and also the other Water Quality Certification let~~ter~~ from 1972 by the State.

1) According to the EPA Definitions for NPDES Discharges the NRC provided, they have absolutely no say-so whatsoever over the dumping of most radioactive contaminants, because the Atomic Energy Act of 1954 is involved, they do not cover so called "source, byproduct or special nuclear materials, nor radium or accelerator produced isotopes as examples. However, "heat" is covered. They did not seem to explain in the attached documents, that the radioactive decay heat is part of what causes the "THERMAL PLUME". Did they tell the State Water people they dump radioactive water, or that the sediment in the river contains man-mades? Did they tell National Marine Fisheries or State Fish and Wildlife about this or about the radioactive air emissions when they asked them by letter to evaluate Endangered Species and fish entrainment and similar? The answer is "NO", one cannot even find the word "radioactive". I called some of them, they had not been told. Now, the Sturgeon is a bottom feeder, it is endangered, ingesting a Cobalt-60 particle with its damage to blood and the central nervous system alone is not a nice way for any living being to die. Nor is slow death from constant irradiation from Cesium-137 in its muscles. The fish entrainment study dates back to 1980. Interestingly it noted among the 22 species of fish an unknown egg and an unknown larvae. What was it? Were there more? Talk about loss of biodiversity. Extinction is forever.

They speak of reforesting areas with the longleaf pine - we know that pines retain radioactive contaminants due to uptake from radioactive air emissions and deposition falling in rain, just like other trees, I did not have time to look up how long the longleafs hold their "needles" if you will, obviously the longer the uptake from soil and water etc. the more contaminated they'd become and when the needles drop the litter would be that much more radioactive for all ground-dwelling species in contact with them, plus re-contaminate the ground at higher levels. Ever tested the Gopher tortoises burrowing on the contaminated site? If the turtles contaminated on and offsite of the monstrous Death of the Earth (DOE) squid site on the Savannah River are any indicator, the gopher tortoises are probably also contaminated, though probably to a lesser extent.

With regard to transmission lines, the testimony of the eminent Dr. W. Ross Adey, before Congress in 1987 on the issue of electromagnetic (as opposed to ionizing) radiations sent shivers down the spines of the collective electric power industry, partly because of his credentials. The effects on cell membranes and fetal development in animals for example was ghastly and included information on statistically significant increases in leukemia and lymphoma in studies of children exposed to power distribution systems, high voltage power lines

and the like. These effects must be addressed. His testimony needs to be considered by NRC as he is one of the worlds experts on this issue. Southern has not considered it. Further studies since then agree.

I feel particularly sorry for the workers in the area whose jobs would be impacted. However, the NRC has repeatedly cited the facility over the years for its terrible personnel contamination record among other things, which is why NRC needs to read EVERY inspection Report ever done. NRC has taken little concrete action, except to repeat that they are "concerned" for the past decades. It should be remembered there are no medical doctors on staff who specialize in health effects of radiation, some of the reports on what has gone on are a nightmare. Like the workers trapped in the drywell. NRC said they had no way of knowing whether or not they died. If I remember correctly, somewhere on the Docket it said they forgot to test them appropriately afterwards. The workers should be compensated, the community should be compensated, and Southern, with its considerable financial and political clout could easily help get replacement work located outside the kill-zone and pay for job retraining and transportation to work. A problem I see always is the worker frustration over potential job loss, which is totally understandable, is sometimes directed at those who explain the dangers, when it should be directed at those who brought the equivalent of a nuclear bomb with a slow leak into their community to begin with. The ultimate tragedy, is that Southern or Georgia Power, has ~~been~~ probably not explained to them that due to them getting contaminated inside the plant, even their bodily excreta can become radioactive, and that is the essence of what was behind the NRC taking Hatch to task over the spreading of sewage sludges from the site under the power lines. ~~It~~ It is doubtful they were told that as soon as they enter the site, under NRC Regulations, they are no longer considered "members of the public". If they were to die inside the plant due to contamination - in theory industry and NRC can state no member of the public died that day as a result of radiation exposure. The Applicant's documents only touch on the terrible, dangerous high-level radioactive waste dump they have prepared outside to put deadly radioactive spent fuel inside casks that have never been tested in the real world, and simulated tests involved Hatch sticking a hot water pad inside one to simulate radioactive fuel rods, which the NRC gently pointed out - oh, so politely - that it "did not accurately simulate the temperatures." The casks - space for 48 is created - will stream gamma radiation into the environment and workers on the pad at a weekly rate of 21,000 millirem off the sides alone, next to the casks, each cask. A former military nuclear scientist has assured me that terrorists could blow the top off the cask in a twinkling of an eye from considerable distance. Other research shows a few rounds from a Milan anti-tank weapon could blast it to smithereens from 6000 feet with catastrophic results. People are being told it is temporary storage and that it will either be sent to Yucca Mountain or to a site on the Goshute Indian Reservation in Utah being prepared by a consortium that includes Southern and the company PFS that has prepared the site in Georgia. One of the leaders of the Goshute opposition to this wanted me to remind everyone, that their tribal chair does not speak for them all, and they do not intend to be at the receiving end of 4,000 casks from across the country into their valley where they already must endure myriad hazardous industries and military weapons test sites on their borders. In the end, in all probability, South Georgia is going to be left with a nuclear dump inside the plant and one outside, forever. The outside one would be eliminated if the plant is shutdown quite soon and no more nuclear waste is generated.

5000 more assemblies at sixty rods a bundle will be generated without shut-

down. This insanity must stop. Yucca Mountain is also basically dead in the water, literally.

This is the South. If a sheriff found out that someone had a decrepit junk car, with a cracked engine block wrapped with baling wire, that not only couldn't pass emissions tests, not only leaked gasoline into the local creek, but carried a deadly cargo locked in the trunk capable of killing an entire county, and a second deadly cargo strapped inside; in a patched bucket, and the exhaust leaked into the car and gassed passengers periodically, plus sprayed neighbors crops, kids and livestock with a fine gasoline mist as a bonus, not only would the offender be jailed for reckless endangerment and a lot more besides, but both the sheriff and the judge would laugh in the face of any such a car owner, if they told the judge and sheriff, having such a car kept mechanics employed, that the people in the car were paid to be gassed periodically or that misting neighbors crops and kids was OK, because the owners manual and the people that wrote the owners manual said it was. That's more or less the situation - only the sheriff and the judge got written out of the loop by the Atomic Energy Act and the NRC and a lot more besides. The NRC is in the loop and holds the power. For the love of God, at least prevent a meltdown and shut this dump down. When the spent fuel pool goes, NRC can watch it on TV from Washington - until the plume hits it. But don't worry about that, I'm sure there's a regulation that says the dose won't damage you all, that NRC wrote. Just remember this, we are all accountable to the Almighty for our actions and I doubt the Creator is pleased with the despoilers of life on earth. Thank you.

Pamela Blockey-O'Brien

May 2001

A-143

NUREG-1437, Supplement 4

LETTER P

May 29th, 2000

2

From: Pamela Blockey-O'Brien

To: U.S. Nuclear Regulatory Commission
License Renewal Application Section
Chief of Rules and Directives,
Div. of Administrative Services,
Office of Administrator,
Mailstop T-6
D-59, U.S. N.R.C.,
Washington, D.C.

Re: License Renewal application by Southern Nuclear Operating Co.
and others for Nuclear Plant Hatch I and II, Georgia.
Supplemental statement and Testimony to my May 10th statement
and Testimony, on behalf of P.O.R./I.P.O.R. AGAINST the License
Renewal Application, to be attached to and made part of the
May 10th document and considered by NRC.

First, a correction : page 5 of the May 10th paper, line 16, a zero
was left off from the K-40 figure, it should read "K-40 was at 16,000
pCi/Kg" NOT 1600.

Also, on page 4. at the end of line 8, it should have been stated
that the contamination went to the wetlands and river, among other
areas.

The May 10th, 2000 hearing was meant to focus on the environmental
aspects in particular according to NRC. The Applicant(s) are being
deceptive when they only consider the Altamaha as being the area of
watershed that covers where the Altamaha is named "Altamaha". The
Altamaha is one of the two most important river systems in Georgia.
It is called the "MIGHTY Altamaha" for a reason, because it is formed
by two huge rivers that have their heads far to the north, namely the
Oconee and Ocmulgee, and the State of Georgia considers the Oconee-
Ocmulgee-Altamaha system one of Georgia's five river basin groups
for River Basin Management Planning and are based on river basin
location, contributing drainage, physiographic features, and related
water resource issues " according to the State. The Oconee reach
extends to the Atlanta area. The Altamaha's floodplains are three
miles to twelve miles wide. The tidal influence extends some 40 miles
inland according to publication. Two thirds of the State's shad come
from the river. It contains river islands and cypress swamps. Lewis
Island, part of the vast State Waterfowl Management Area and areas
of significant wildlife resources has a 300 acre stand of virgin
cypress over 1,000 years old. The Big Hammock Wildlife Management
Area near Hatch (and in the windpath) covers around 6,400 acres. The
Big Hammock Natural Area is adjacent to it. On the other side of
Hatch (again in one of the windpaths) is Bullard Creek Wildlife
Management Area. The Big Hammock Natural Area stretches eleven miles
along the river and Watermelon Creek. Nearby creeks that drain into
the Altamaha (from all windpaths and rainfall deposition/radioactive
contaminant deposition areas) include 1. Bells Mill Creek, Cobb Creek,
an unnamed creek near English Eddy (village), Milligan Creek, Allig-
ator Creek, Little Alligator Creek, Bullard Creek, Ten Mile Creek
and Little Ten Mile Creek, also an unnamed creek that enters wetlands/
swamp near Hatch; plus there is a lake called Big Pond. All of
these areas receive radioactive fallout from Plant Hatch's air/noble
gas releases. Wildlife, birds (and people) will receive radioactive

iodine, tritium and the decay products of Cesium-137 and Strontium-90
among others to their thyroid, muscle, bone etc. etc.

All the aforementioned surface waters will have this radioactive
garbage dumped in them, in particular when it rains and deposition
increases. The area receives massive rain systems. Speaking of
which, Hatch's own PSAR under the section on floods, cites USGS data
on a Jan. 22nd 1925 historical record flood at the plant site
of 200,000 cubic feet a second PLUS there was a calculation of a
peak discharge of 612,000 cubic feet a second corresponding to a
stage at el 105 feet based on a 1916 storm. Why did Southern not
include these figures in the application?

Southern has basically refused to discuss all the so-called Class I
issues. This is really an outrage, and done a toss-out of SAMAS.
They have said the population is sparse and it's mainly forested
or agricultural. This is a prime farming area. Vidalia Onions are
a major crop not too far away - they are considered the best type
of onions in the world by chefs and sell all over, yet they are in
Hatch's windpath also. This is a disgrace. Class one issues should
cover effects to pollinators, including effects on their reproduction
pollinators like bees and butterflies. Herman Müller won the Nobel
Prize in 1943 for his work on the genetic effects of radiation, and
showed through his work on Drosophila, a fruit fly, that ionizing
radiation affects not only the biological organism exposed but the
seed within the body from which future generations are formed, and
one of the effects is of course sterility. Bees are particularly
vulnerable to effects of pesticides and radiation - in "Silent Spring"
by Rachel Carson so many years ago, she pointed out the synergistic
effects of Strontium-90 combined with toxic chemicals/pesticides.
There is a crisis with pollinators. Bees are literally being physically
brought in in hives, by truck, back and forth across farming areas
in the entire South, with hives set up for some days to co-incide
with blossoms for pollination. It is an insane situation that threatens
the nation's food supply. Biologist Carson was ridiculed and vilified
by the industry who produced the pesticides etc. - of course she was
right, and is now on a postage stamp. NRC simply cannot allow
Plant Hatch to continue to operate in an area vital to agriculture.
Between Soperton and Vidalia there is a sizable goat farm. The milk
(Or perhaps cheese) they produce should be tested also, as well as
the grass. In one of Hatch's Annual Reports the months they listed
that they did the garden census on, were actually going into winter
when everything would be dead or dying off. Typical.
The bioaccumulation factors up the food chain are of great importance.
The area is generally a low income area. Many people hunt, fish and
have gardens - it's all a matter of survival. When all pathways are
considered together the effects are serious.
Shutdown of Hatch would eliminate a large portion of the air dis-
charges and dumping to the Altamaha. The radioactive spent fuel pool
issue and need for recirculating water for it etc. would of course
remain. With the reactors shutdown, the danger of the cracked core
shroud and braces blowing would also be more or less taken care of.
The fuel in the core should be immediately removed to the pool.
The outdoor radioactive spent fuel storage must NOT HAPPEN. IT IS
A MAJOR ENVIRONMENTAL ISSUE and as the pool is almost full the
relicensing is interwoven with the storage of the spent fuel. It
cannot be ignored or shoved under the rug. To pretend that sticking
the DEATH of the Earth outside in an untested cask - even a tested

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could ingest water contaminated with E.Coli if the system is not functioning as it should, and this E.Coli could be a mutated version. This could have serious consequences, including cancer in the infected individual perhaps, at the very least a form of E.Coli infection that is hard to treat. - The Applicant mentions that pathogenic microorganisms are ubiquitous in nature occurring in the digestive tracts of wild mammals and birds and thus in natural waters, but are usually only a problem when the host is immunologically compromised. Radiation is a powerful suppressor of the immune system response. Women and children are more vulnerable to its effects as NRC well knows (or should), the continuous low level radiation exposure to the surrounding populations in an at least fifty mile to 100 mile radius will have compromised the immune systems of the most vulnerable in particular to some extent, this will make them more vulnerable to infection if they drink water containing pathogenic microorganisms.

There are enough species on or adjacent to Hatch that are listed as Endangered or Threatened or Rare/Unusual, such as the Wood Stork, Bald Eagle, American Alligator and Shortnose Sturgeon to warrant permanent shutdown on that issue alone. Cessing woodstorks in the wetlands east of the "cooling towers" with noble gases while they forage in radioactive leftovers from the spent fuel pool spill makes a sorry picture. The listing could shift to "extinct".

It is imperative that NRC read every single DETAILED inspection report and all the violations, indeed the entire Docket since start-up, that way the environmental and other impacts can be better assessed. That way NRC gets to see things like the fission particulate monitor and noble gas monitor being inoperable. The reason what has happened over the years is important is that it shows a pattern of serious problems and events, in some cases repetitive, which will recur or become worse due to aging etc. In the May 10th testimony, I spoke of the pine needles and contamination. In the past, pine needles at the Naxley Health Dept. contained 220 pCi/kg Cesium-137, 730 pCi/kg Cesium-144 and 4300 pCi/kg of Beryllium-7 (no, it comes from the plant, not the cosmic ray song and dance gone through ad nauseum) Spanish moss at the Roadside Park contained 460 pCi/kg of Cesium-137, 500 pCi/kg Co-144 and corn husks west at 0.75 miles Cesium-137 at 56 pCi/kg. Grass yo-yo'd up to 1600 pCi/kg for Cs-137. The City of Naxley's groundwater showed alpha at 7 2 4. How much pCi/l

higher is all this now? Its hard to tell from published reports, not only because experience showed data was being left out, but locations get changed etc. however, as one example, in 1990 Beta radiation in groundwater was 7 pCi/l 1.6 miles NW and Beta at 5 pCi/l at the roadside park in groundwater in 1997. Isn't Beta meant to be separated out above 4 under EPA? Beta deposition in rain was 253 pCi per square meter, at 0.5 miles west south west, and 222pCi/M2 at 1.8 miles north east near the river in 1997, so Hatch is spreading its radioactive poisons around nicely-aren't the local people lucky? Radioactive rain, pitty pitting down on their children, crops and those Endangered and Threatened Species - but hey, why should Southern and Georgia Power care - money is rolling in. Any company that is as environmentally unconscious as to spray herbicides in wetland areas (p C-37) and under transmission lines

one - is not a major environmental issue and is not part and parcel of the relicensing is obscure. The workers are at grave risk as well. Both Southern and Private Fuel Storage are "HOG's", i.e. HOLTEC AND/OR OWNERS GROUP members. HOLTEC makes the case to be used. Private Fuel Storage is trying to set up the site in Utah that many of the Cornute Indians do not want on their land. The State of Utah doesn't want the stuff in Utah either. The cumulative consequences of the incredible amount of gamma radiation streaming off these casks (and a few neutrons) to workers, the surrounding population, the environment etc. will be terrible. The slab they sit on becomes radioactive as NRC knows, the water from rainstorms running over them will also be radioactive and will enter groundwater and/or the Altamaha. Southern has been putting out PR on the casks saying ridiculous things like what will the casks look like, instead of telling the public they contain death, and the explosion of such a cask would have horrendous consequences. A high level radioactive waste dump is being created outside next to the

Altamaha and that community is going to get stuck with it, along with the existing indoor one, and neither NRC nor Southern is telling that community that it'll be a cold day in hell when that all gets moved out of there. To add insult to injury NRC doesn't want to include the issue nor does Southern. Well, we demand it be included. This is an environmental and an economic justice issue and so is the entire relicensing. Southern does not want to address the environmental and economic justice issues, although it is a low income community. Of course they don't, that's why that poor, rural community got stuck with this monster to begin with. Why it wasn't put next to the Governor's Mansion. It's a classic case - the Applicant's own documents show that there is a disproportionate number of low income households in the 50 mile radius. Appling County itself has 22.35 % of its households below the poverty level. Other counties have even higher numbers in many instances. As stated earlier, many people rely on the land to help them survive, some also supplement their diet that way even though they say not technically fall into the poverty level classification. They will be disproportionately affected from a health perspective. Two Appling Co. census tracts have a higher percentage of households below the poverty level namely 29.1 % and 26.2% Adjacent to the river. Compare that to the given Georgia total of 14.05%. The continued operation of Hatch has environmental consequences due to its discharges on the environment on which the poor also depend. In order to sustain themselves, this affects their health. It is a major issue. Looks like the wasted tax revenues from Hatch didn't do much for the poor...makes one wonder who benefitted.

Another key issue is the fact that many large prisons are located in the area, including the massive State prison at Reidsville IN THE WIND PATH across the river. Is Southern going to get that evacuated at seven ft. a second during a meltdown? In particular if it's visiting day? Is NRC aware that countless families travel hundreds of miles in some cases down to those prisons, and the State prison in particular, to visit the incarcerated relatives. Anyone who thinks they could evacuate that sort of scenario in a hurry has lost touch with reality.

The area prisons were not addressed. They should be. Regarding the sewage being dumped to the Altamaha after some treatment: because contamination is also rinsed off in showers and workers can have contaminated excreta, it will be radioactive. In E.Coli, radiation induces an error-prone DNA repair system which leads to mutations that would otherwise occur only rarely according to the National Academy of Sciences persons swimming in the Altamaha downstream, unaware of sewage discharge, could ingest

and thinks they are helping the flatwoods salamander, and spews radioactive gases into the air etc. as well should be warning distributing bumper stickers to their stockholders saying "The Environment? Who cares? We don't." Glyphosate (in Accord) IS toxic and IS an irritant (EPA). They should hire extra people (for the price of the herbicides is not cheap) instead to remove unwanted vegetation - vegetation that of course may support other species - after warning the people about the electromagnetic radiation off the transmission lines and breathing in Hatch's radioactive noble gases.....

To get some idea of how things go at Hatch, both the public and the NRC should review Inspection Report Nos: 50-321/95-01 and 50-366/95-01 (Public can get this from NRC Washington Public Document Room Tel 1800-397-4209 access the PDR by pressing "0" - it will cost under five dollars, ask the PDR for cost.) this is not even one of the worst reports, just a report. Then consider one of Hatch's recent events, the Loss of Coolant Accident, could ultimately have led to a meltdown and that one of the systems, the High Pressure Core Injection (HPCI) kept messing up, just as it has done since years and no one knows the cause (its kind of an important issue since its part of the Emergency Core Cooling Systems) and then add to that, that Hatch has a cute little gizmo called the DIRECT TORQUE ~~XXXXXX~~ VENT SYSTEM - in plain English, what this does in the event of a certain set of accident criteria, is that in order to gain time and avoid core melt somewhat, and assuming that either all core cooling systems keep the core doused with water and there is no loss of Coolant Accident, or, in event of a LOCA they can avoid the drywell blowing one way or another - while its melting down - they intend to VENT THE RADIOACTIVE BUILDUP, BYPASSING THE STANDBY GAS TREATMENT SYSTEM, OUT THE STACK OVER THE POPULATION OF SOUTH GEORGIA BIGHTIME. THIS WOULD BE AN ATTEMPT TO RELEASE THE PRESSURE. Under normal conditions, the standby gas treatment system filters particulates and radioactive iodines in order to REDUCE - NOT ELIMINATE, REDUCE - the level of airborne radiation contamination released to the environs via the main stack and can filter (again it cannot eliminate everything) exhaust air from the drywell and the torus/pressure suppression pool. They hope stack filters may trap some particulates (which assumes that operates, in the past documents it is not clear whether or not they actually have an in stack filter, that needs ascertaining, also whether they have the Post Accident Sampling System in the stack or if they got out of having that - (did they?) - since they kept getting extensions on PASS.. Furthermore, if and when they decide to radioactively gas south Georgia with the stuff going out under high pressure, the entire gaseous piping system could be massively degraded due to aging, pitting, corrosion, from radioactive decay heat/steam etc. and its anyone's guess what the consequences could be, yet for some reason it does not appear that is not going to be considered, and it should all be examined, etc.

NRC better understand that radioactively gassing South Georgia is NOT an option. Neither is continuing to allow the operation of this disaster waiting to happen NRC's own staff said was in need of being banned (the Mark I, which Hatch is)..

Samuel J. Jansch, Former Chief Administrative Law Judge, U.S. Atomic Energy Commission, said in his foreword to "Meltdown - the Secret Papers of the Atomic Energy Commission": As citizens you will also have to decide what to do about the one hundred nuclear

plants that are now operating - WITHOUT BENEFIT OF THE IMPARTIAL SAFETY REVIEW REQUIRED BY LAW - around the United States." And further:

"For what was the Joint Committee (Congressional Joint Committee) on Atomic Energy doing as the Atomic Energy Commission and the Nuclear Regulatory Commission hid data about potential nuclear plant hazards? And what has the White House been doing - except looking the other way - as official bodies, such as the President's Commission on Three Mile Island Accident, warned of the gross mismanagement that has occurred in the commercial nuclear power program?"

("Meltdown - the secret papers of the Atomic Energy Commission," 1986 by Daniel Ford, former Executive Director of the Union of Concerned Scientists, is based on tons of thousands of pages of US A.E.C. internal documents he acquired using the Freedom of Information Act and Ford began his research in 1971 according to Ford.)

One example of how little things have changed, is that it was found out that in many turbine situations for nuclear power plants, one was oriented rotating towards the reactor, the other away. If the turbine shaft snapped, the one oriented towards the reactor would go barrelling towards it. This is the case at Plant Hatch, Plant Farley and at Plant Vogtle built AFTER this issue was known and it still was allowed. Degradation of Hatch's turbine shaft (or blades)

due to aging etc. is a very real possibility, and if this is not included in the review (I may have missed it, but I couldn't find it) there should be a rule to include it as well as anything else left out. The consequences of a huge turbine rotating on the loose would be horrible, the environmental (and human) damage would be profound.

Last, but most important, on the map Altamaha School is near Hatch. Children, with their developing bodies, bones, brain, reproductive organs etc. are more vulnerable than adult males to the medical and biological consequences of radiation exposure. For the school children to be subjected to breathing in the radioactive noble gases emitted up the road is a disgrace. In event of a meltdown/explosion/air release catastrophic accident these children may well die of radiation sickness or be damaged for life, with shortened lifespans and myriad health problems. 2) because such an event can happen so quickly with reactors of the Hatch type, according to NUREG-1079, and they have no containment DOME over the reactor, fast evacuation would be impossible. 3) first responders are local. Appling County Emergency Rescue and the local fire dept. are totally ill-equipped to deal with such an emergency and evacuation and it is outrageous to expect them to. 4) the recent LOCA is an example of the beginning of what could occur as documented in the MIT report and should serve as a warning. 5) The July 20th 1999 NRC Special Team Inspection Report conducted June 16 to June 25th, 1999 is further proof of the potential for catastrophe on the horizon if the MSIVs had continued to fail, the RCIC system had not even operated manually and the recirculation pumps continued to fail etc. etc. and of course an ARRAH vent line cracked and leaked eight hours. 6) because gaining the

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LETTER Q

From: Pamela Blockley-O'Brien

To: US NRC
 License Renewal Application Section
 Chief of Rules and Regulations,
 Division of Administrative Services
 Office of Administrator, Mailstop 1-8,
 G-59, US NRC
 Washington DC 20555

June 7th, 2000

Re: License Renewal Application by Southern Nuclear Operating Co
 and others for Nuclear Plant Hatch 1 and 2, Georgia.
 Extra ADDITIONAL supplemental statement and testimony to be
 attached to and made part of my May 10th, May 28th, and June
 4th statements and testimony and considered by NRC.
 THIS IS THE THIRD SUPPLEMENT TO MY MAY 10TH 2000 TESTIMONY.

Last weekend, on 4th, fishermen who fish the Altamaha and coastal
 areas, who were complaining about the state of part of their catch
 had up DEFORMED, MUTILATED CRAB AND ULCEATED SORE COVERED FISH
 protecting Altamaha pollution. While there are undoubtedly other
 sources of pollution more easy to control, as NRC well knows,
 effects of radioactive contamination from ionizing radiation includes
 deformed offspring, mutations, reduced fertility, cancer, leukemia,
 massive suppression of the immune system response making vulnerability
 to other diseases and illness increases, spontaneous abortion, ster-
 ility, abnormal larvae (in fish), mutations in insects, skin burns
 from "hot" particles, and on and on. Over the years the following
 radioactive contaminants have been found in sediment within the
 applicant itself does not rule out cause from Hatch for adults to doing:
 Cobalt-60 (adults) Cobalt-58 (adults) Zn-65 (adults), Cs-134 (not
 ruled out) Cs-137 (not ruled out), Cs-134 (not ruled out), Cs-137 (fueled
 the issue) Ru-103 (does not rule out), Sr-90 (does not rule out)
 Here are some surface water samples collected by Georgia Power Co
 and one by Georgia EPD after the radioactive spent fuel pool spill
 at a location known as Beams Landing: Tritium 103,000 pCi/l, 86,000 pCi/l
 113,000 pCi/l, 77,000 pCi/l - all by GPC, 208,000 pCi/l (EPD).
 Co-60 140 pCi/l GPC, 1600 pCi/l EPD.

Cs-134 2200 pCi/l, 420 pCi/l GPC, 2,100 pCi/l EPD.
 Cs-137 3,400 pCi/l, 570 pCi/l, 550 pCi/l GPC, 3000 pCi/l EPD
 RIVERS TRANSPORT SEDIMENT DOWNSTREAM.
 Some sediment samples taken by GPC MONTHS after the spent fuel pool
 release and designated by EPD as "from Hatch spent fuel pool
 release" : Plutonium per dry kilogram-pCi/kg
 Cobalt 60 : 35,000 pCi/kg (thirty five thousand) Beams Landing
 290 pCi/kg, Estuary and US 17 Darien (at coast)
 Zn-65 : 12,000 pCi/kg, down at the estuary it was 170 pCi/kg
 Cs-134 : 36,000 pCi/kg - then down at estuary 2200 pCi/kg
 Cs-137 67,300 pCi/kg, then down at the estuary 4,700 pCi/kg
 Ru-103 7,600 pCi/kg - down at estuary 61 pCi/kg
 It should be noted that of course this radioactive contamination
 could have been more extensive, as that is only what got published.
 It is interesting that on the Georgia-137 from Hatch in sediment,
 in one of their annual reports they fudge the issue, but the 202 says
 in one of their reports it came from Hatch, and in another that
 is more recent that it may or may not have come from Hatch now.

7,

the children and surrounding population via the DRY, bypassing the
 wet, trying to avoid overpressurization of the pathetic, inadequate
 existing force of so-called containment trying to avoid early meltdown
 in a) outrageous of doesn't solve the meltdown problem. 7) because
 NRC's own staff wanted to ban pressure suppression "containment"
 like at Hatch, plus said there was a 90% probability of that contain-
 ment failing, and d) because neither Southern, Georgia Power, GE,
 the NRC can prove beyond a shadow of a doubt that an accident result-
 ing in meltdown and/or major radioactive release to the air and/or
 water will not happen at this aged dump of a reactor nor can they
 prove beyond a shadow of doubt or even reasonable doubt that children
 at the school, as well as Appling County and surrounding county
 children will not die or be damaged due to radiation exposure, and
 children in utero likewise (no matter how low the dose, or high the dose)
 and the risk to the children is simply too great to allow continued
 operation. I THEREFORE SUBMIT THIS LAST PARAGRAPH AS A FORMAL REQUEST
 UNDER SECTION 2.206 OF 10 CFR CH. 20 FOR PERMANENT SHUTDOWN OF PLANT
 HATCH UNITS 1 and 2, AND PERMANENT LICENSE REVOCATION, PER 2023
 BEING THE ENTIRE PARAGRAPH AND POINTS ONE THROUGH EIGHT. Considering
 the children whose lives are at risk and the health damage and the
 danger, denial of this 2.206 would constitute NEGLIGENCE AND NEGLIGENCE
 in particular in event of serious accident.

Pamela Blockley-O'Brien

Copy to : The Executive Director, US NRC, Washington, D.C.

(1.5. Executive Director for Operations, U.S. NRC, Washington DC 20555)

Ms. Rita Kilpatrick, Executive Director, GPC, Atlanta, GA.

May 2001

A-147

NUREG-1437, Supplement 4

Due to the almost incestuous relationships which exist down here when it comes to nuclear issues - some of which I detailed to the Atomic Safety and Licensing Board during the matter of the Licensing attempt of the Georgia Tech Nuclear Reactor by Tech which Georgia Power and the Atomic Energy Commission helped Tech bring here to begin with, and my attempts to get the staggering CURIE quantity of Cobalt-60 stuck in the Tech Reactor spent fuel pool out or downtown Atlanta which threatens the campus and downtown, to no avail - (I must admit, I didn't realize that the former Governor I appealed to for help site on Georgia Powers board in the Applicants submission - though Tech reactor staff did tell me since then that Georgia Power still needs the Cobalt to do testing to see if co-60 degrades cement.....though I did know that the former NRC Regional Head, O'Reilly, went to Georgia Power.)- anyway, as I was saying, the contorted relationships make it imperative that INDEPENDENT, non-industry, non-government affiliated testing be done on all these issues I have raised, and others have, and by companies which have never held government contracts or nuclear industry contracts or their subsidiaries, affiliates, brothers, cousins, dogs or cats. That would eliminate companies like Bechtel of the Marten Squad (DOE) construct folk such as MGS, and SAIC, and Chem-Nuclear etc. And of course law, All the crab, clams, mussels, etc. and fish - including sturgeon and eggs if possible, and turtles, tortoiseshell, frogs, aquatic plants etc. need to be tested, and those tests must PROMPTLY doing the sort of thing that sometimes goes on, like mixing up contaminated and non-contaminated stuff/fish, or hanging onto samples until some of the short lived contaminants decay before testing and similar.

It needs to be found out if everything is more contaminated than we already know - and that includes the groundwater, sediment and so forth.

It should also be noted, that the QDCM, which I already said was written in the Stone Age previously - allows things like reporting levels like 300 pCi/l for Co-60 in water and 13,000 pCi/kg wet in fish for crying out loud, or Iodine 131 of 20 pCi/l in no drinking water pathway exists.... the thing should be thrown in the trash.

It's a wonder restaurants aren't asking customers if they'd like their cobalt-60 pan fried or just plain grilled, with a little radioactive iodine sauce on the side.

The Applicant has stated that in reference to the Georgia Coastal Zone Management Act that "Based on the distance to the coastal zone, past NRP performance with respect to discharges and releases, and the fact that no major changes in operations are expected during the license renewal term, SNC believes that direct impacts to the coastal zone from NRP operations during the license renewal term are unlikely," and they believe certification is inapplicable. Oh, really. What's the excuse to the spent fuel pool spill, or loss of coolant? A meltdown? Due to the long full radioactive lives of the radioactive contaminants, the spill-and the other spills- are significant and cannot be disregarded. Refined, mutated crab cannot be disregarded, neither can fish covered in spores. And now about that chlorine spill? discharge? And the chemicals used to dissolve radioactive core buildup? Combined with radioactive contaminants no wonder that dump of a plant is a plague, a plague on the land.

Q01

Q02

LETTER R

From: Pamela Blockey-O'Brien

To: US NRC
License Renewal Application Section
Chief of Rules and Directives,
Div. of Administrative Services,
Office of Administrator, Mailstop T-6,
D-59, US NRC,
Washington, D.C. 20555

June 4th 2000

Re: License Renewal Application by Southern Nuclear Operating Co. and others for Nuclear Plant Hatch I and II, Georgia.
Additional supplemental statement, and correction to my May 29th, 2000 supplement AGAINST the License Renewal, to be attached to and made part of the May 10th, May 29th statements and testimony and considered by NRC.

1) Correction: May 29th Supplemental Testimony, the word "ALSO" was accidentally left out between the words "paragraph" and "as" on page seven, 16 lines from the page top - I meant that NRC consider it as part of the License Renewal testimonies and ALSO as a 2.206. Further, the word "not" on page 5, ten lines up from the bottom, second word from the right, should be left out and the word next to it, "is", changed to "it's" - so that it reads "does not appear that it's going to be considered?...etc."

2) Additional supplemental statement: Another reason site meteorology should be assessed as outlined in my May 10th testimony on page 2, if not better, and one years worth is as good as useless, is, for example, that in 1999 Savannah received 11 inches of rain in 12 hours in that area and went underwater and the system could easily have moved across the Hatch area under other circumstances, and it must be borne in mind that a region is considered to have a 100 year flood when 10 inches of rain falls in 24 hours - it does not mean it is a flood that only happens every 100 years. In 1984 tornadoes and high winds caused \$14 million in damages across an area including Toombs and Tatnall Counties next to Appling Co where Hatch is. In 1986 tornadoes struck south Georgia and one touched down in Baxley, Appling Co. injuring four and destroying five homes. In other counties that year others were injured in tornadoes. There are many other examples of serious weather, damaging storms, etc. across South Georgia year after year, including hurricanes crossing the area bringing drenching rains if one goes back even 50 years. Georgia is known for its volatile weather - ice storms can cause freezes almost to the coast on occasions (ice storms to the north). Furthermore, updated earthquake data is now available for the South, including Georgia, and it must not be forgotten that the Charleston earthquake caused chimneys to fall in Atlanta, shattered windows and knocked down a house there, and according to a 1996 news report, experts predict a 25% chance of a Charleston magnitude earthquake that will hit SOMEWHERE in the east in 25 years. In its comments on the CRAC-2 report, the Subcommittee on Oversight and Investigations report to Congress, noted that "Peak" does not

necessarily mean worst case results because the CRAC-2 model considers only one years worth of data and does not model precipitation frequency beyond a distance of 30 miles from a reactor, may not adequately characterize the frequency of precipitation events and this was significant as

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R02

Appendix A

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as highest consequences from accidents are predicted to occur when a radioactive plume encounters rain over a densely populated area. Furthermore, that assuming fatal doses i.e. assumptions regarding fatal doses, may be subject to question as, they stated, the model assumes that "supportive treatment" is available of special sterile procedures, massive use of transfusions and antibiotics, and considerable medical attention, and that the Reactor Safety Study concluded that such a level of attention would be available to only 2,500 to 5,000 people EVEN IF THE TOTALITY OF SUCH RESOURCES IN THE ENTIRE U.S. WERE USED.

I would add to that, that the level of knowledge required to treat patients suffering radiation exposure in most hospitals here and abroad is sorely lacking. One of the best hospitals in the world for this being in Japan (as a result of the nuclear destruction of Hiroshima and Nagasaki.) The psychological trauma of medical staff faced with trying to deal with persons dying from radiation exposure of the worst type - with the blood pouring from every orifice in the body as the body literally "melts down" because the molecular internal structure of living cells is breaking down (or, to quote the essentially government funded (including DOE etc) National Research Council of the National Academy of Sciences Biological Effects of Ionizing Radiations Report No. 5, on effects of low level radiation (which left much to be desired although the nuclear club hated it) "Ionizing radiation is energetic enough to displace atomic electrons and thus break the bonds that hold a molecule together." - that sort of trauma could lead to staff meant to be helping unable to. Now many lead lined coffins does Georgia possess in which to bury radioactive remains? Southern should answer that. The attempts of international bodies including the notorious International Atomic Energy Agency and the awful International Commission on Radiological Protection (who do not recognize direct medical experience with Atomic Bomb victims, Chernobyl or other radiation victims as being relevant according to the Permanent People's Tribunal Session on Chernobyl, Vienna, 1996) to cover up the true effects of Chernobyl is relevant in connection with attempts to project effects of major nuclear accidents, because people labor under the delusion few died, and accidents elsewhere may be similar. Chernobyl only lost between 4 % and 10% (estimates differ) of its radioactive core inventory. There was no full meltdown - in part due to the heroic efforts of the workers - 800,000 of them drafted to assist in emergency response, thousands of whom are now dead. The Russian so-called "Secret Protocols", serious scientists from across Eastern Europe and others, come up with more than 25,000 killed immediately in the course of the disaster. A Russian nuclear physicist from Kiev stated in the year following Chernobyl, "over 20,000 pregnancies have been aborted due to the Chernobyl catastrophe only in Kiev". When the amount of hospitalized passed 10,000 during the catastrophe, it was solved by increasing the levels of "accepted" radiation levels to people by fifty, i.e. were automatically healthy and dischargeable, so they presumably died at home - or somewhere. A few days after the Ministry of Health Care put out the edict, the number of hospitalized (incoming) decreased, and the discharges increased. An Excerpt of the Protocol of May 12th, 1986 states: "It is reported by Mr. Schtepin that in the course of the last day 2,703 more persons have been hospitalized generally in Byelorussia, 673 persons discharged from hospitals, 10198 persons are undergoing treatment and medical examinations in hospitals". In parliamentary hearings in the Supreme Council in 1990, it was admitted that 1.6 million children received "irradiation doses that are worrying us" and if they lowered the dose limits (over dose) collection

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of "1.6 million people would have to be considered." (i.e. off what is really contaminated land). The research in what used to be the former Soviet Union on Chernobyl is massive, the results are horrendous. So bad is the contamination, that one proposal was to raise the permissible level of nuclear contamination in soil, especially in unoccupied areas, relocate the population on to that land, and relax contamination standards in food and water. According to the aforementioned Tribunal Session on Chernobyl, comprised of experts from all over the world and across Russia, they may have got the idea from a new policy of the notorious ICRP stating after a nuclear accident the principle of applying ALARA (a terrible policy in itself which states that radiation doses etc. should only be kept "as low as reasonably achievable" (alara) depending on technology, how much money industry etc. wants to spend on it etc. which is how nuclear industry and plants operate worldwide and has nothing to do much with health) simply NO LONGER EXISTS, that it requires risk/benefit studies to justify evacuation, restricted land use or consumption of food and similar criminal attitudes. Is this what people can look forward to if Hatch or any other plant blows? Will people be told to eat their radioactively contaminated food while watching their children die of cancer or their wives aborting and told to shut up and be thankful because ICRP and IAEA has decided so? And besides, NRC is agreeing to new generations of nuclear power plants so industry can continue to generate nuclear waste and create their beloved plutonium-uranium economy worldwide? Is this why Southern put the severe accident dollar figures so low? In the interests of protecting public health and the environment, NRC must pass a Rule forbidding this from happening. (If a plant near Washington blows NRC will be glad it did.) It is also unclear whether Southern took into consideration the colleges that could be in the windpath of a nuclear release from Hatch, such as in Statesboro, or the huge Army base at Fort Stewart - the military would be about as pleased as a disturbed rattlesnake if Southern/Georgia Power radioactively gassed its troops - who knows, they might even consider returning the favor and wipe out north Georgia in the process. You know, Mutually Assured Destruction, that old standby. Better shutdown Plant Hatch before that happens.

Pamela Blockay-O'Brien

Pamela Blockay-O'Brien.

May 2001

LETTER S

The Executive Director for Operations,
U.S. N.R.C.,
Washington, D.C. 20555

June 15th, 2000

Dear Executive Director,

Further to NRC's telephone conference with me today concerning my 2.206 Petition against Southern/Georgia PWR's Plant Hatch I and II, Baxley, Georgia, next to the mighty Altamaha River, the sources of some of my bases should be better clarified, so I hereby submit some additional source information to support the following bases to be included as part of my 2.206 Petition for permanent license revocation and permanent shutdown of Hatch I and II, for consideration:

Under bases 1) and 8) on effects to children etc. 1
"Lens Opacities of Children of Belarus Affected by the Chernobyl Accident" by A.W. Arinichin and L.A. Capanikova, Research Clinical Institute of Radiation Medicine and Endocrinology, Ministry of Health, Republic of Belarus, Aksakovskina, 223032, Minsk, Belarus.

"Monitoring of Cytogenetic Damages in Peripheral Lymphocytes of Children Living in Radiocontaminated Areas of Belarus" by Ludmila S. Mikhalevich, Institute of Genetics and Cytology, Academy of Sciences of Belarus, P.Skorina St., 27, 220072, Minsk, Republic of Belarus (Fax: (0172) 68-49-17 this fax is in a 1998 document), and by the same author: "Study of Genetic Effects in Somatic Cells of Children Living on the Contaminated Territories in Belarus".

Relevant excerpts from Nov. 1, 1982 Committee on Interior and Insular Affairs, U.S. House of Representatives, Washington, DC, Subcommittee on Oversight and Investigations, "Calculation of Reactor Accident Consequences (CRAC2) for U.S. Nuclear Power Plants (Health Effects and Costs) Conditional on an SST Release: This document is enclosed. It should be noted that the Peak Fatal Radius is 20 miles (when evacuations only go ten miles) and Peak Injury Radius is 70 Miles, for Hatch. Even taking into consideration a 50 mile ingestion pathway (current) it is all inadequate. The seven hundred dead per unit was based on the population data back then of course. The explanatory text which is part of the report is of great importance. PLEASE PROVIDE A COPY OF THIS TO THE HATCH RELICENSING STAFF AS I FORGOT TO INCLUDE IT WITH MY JUNE 4th Submittal referred to in our conversation today. (i.e. to be made part of that also) It is obvious that children would be among the dead.

Base 2) Chernobyl had a 1,000 ton steel and cement coverneutron shield over the reactor (and one below) which shot up in the air and came crashing back down at an angle on it. It has been stated that this was one of the reasons Chernobyl only lost between 4% and 10% of its radioactive core inventory. Hatch reactors have only the metal building roof above them according to NRC Inspector Skinner (now retired I believe) - and of course have no, repeat NO huge containment dome. Chernobyl also had a "pressure suppression pond" below it, and a (due to the accident) flooded basement below that. To avoid a truly massive meltdown and explosion happening with the core breaking through into the water, while aerial runs

were being made to drop the more than five thousand tonnes or mixture of lead, boron carbide, clay and sand on the reactor, a group of three workers in wet suits struggled through dark, flooded corridors to reach the pools slide valves and prise them open, and then another five volunteer firemen split in a group of three and two, the first three got a pump truck and an armoured car, drove the pump truck into a tunnel under the reactor got to the edge of the water pool, attached hoses, primed the pump and got out in the armoured car in five minutes flat, two others went in later to make sure the pump worked, and two of the first group had to go in again and restart it later. Other workers were pumping liquid nitrogen (forcing it) through lower reactor piping into spaces around the reactor vault, as soon as the water was out of the pool and basement the thousands of workers (in relays) began to tunnel under the reactor and start installing a flat heat exchanger mounted on a massive concrete platform 900 metres (about 2700 ft) square and 2.4 metres thick - the last line of defense against possible meltdown of the (main bulk of) the reactor core. These people gave their lives to save the world. Had the core melted and exploded also down into the river and groundwater, it would have reached the Black Sea ultimately and from there the world's oceans. Some contaminants HAVE already shown up in Black Sea sediment. Obviously Hatch is smaller, however it is on the banks of the Altamaha which empties into the Atlantic and the Altamaha Sound at Darien, two counties downstream at Georgia's magnificent Golden Isles area, with its fishing fleets, thousands of tourists, incredible wildlife and birds and endangered species and areas vital to migratory birds coming from South America the West Indies etc. Hatch has already contaminated the sediment down to the coast - in part from the massive spent fuel pool accident in 1986 - documented that the sediment is contaminated by both State and Georgia Power. Cobalt-60 is NOT a natural constituent of sediment, nor is Cesium 137, Cobalt-58, Zn-65, Mn-54, Cs-134 but now its in there thanks to Hatch. Not to mention they contaminated onsite groundwater back in 1979, and a lot more besides. Area people are on wells. The huge Ft. Stewart Army Reservation falls in the Peak Injury radius and in the fifty mile ingestion pathway. The State Prison in the radius also. And of course the school's in the 20 mile kill zone. As is the town of Baxley and some other towns. Nureg-1079 shows under certain criteria, the core (Mark I as Hatch is) can begin to uncover in 33 minutes. Notification is 45 minutes. There is no way fast evacuation could occur - which brings me to:

Base 3) Enclosed is a June 1999 photo of the Appling Co Emergency Rescue HQ, to show the size. The painted school bus is on the right. There are two ambulances and two other emergency vehicles. The fire station is not on here, its smaller and outer. The emergency rescue is in a sort of converted gas station by the look of it. These people will die if they have to go and try and confront a nuclear disaster. It is cruel to expect them to. Of course, considering Hatch has a cracked core shroud held together with braces that could fail due to aging and vibration anyway, a serious accident would probably guarantee that. At Chernobyl the refueling platform etc. above the reactor (just like at Hatch) fell down into it of course. That would likely happen at Hatch. Any workers or rescue personnel on it would die. In event of an explosion, the spent fuel pool at Hatch is shared by both Units and is UP at around fourth floor level so fuel can be moved to it, there would likely be the end of the spent fuel pool too. THAT would be the ultimate catastrophe. CRAC2 doesn't consider the spent fuel pool going too. It only has the building roof as protection.

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S02

Appendix A

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NUREG-1437, Supplement 4

LETTER T

June 9, 2000
sent via certified mail

License Renewal Division
Chief of Rules and Directives
Div. of Administrative Services
Office of Administrator
Mail Stop T-6, D59
U.S Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Environmental Impact Statement for the License Renewal Application for Edwin I. Hatch Nuclear Reactors I and II by the Southern Nuclear Operating Company and others.

COMMENTS OF CAMPAIGN FOR A PROSPEROUS GEORGIA

The following comments are filed by Campaign for a Prosperous Georgia (CPG) as part of the Environmental Impact Statement process for the License Renewal Application for Edwin I. Hatch Nuclear Reactors I and II by the Southern Nuclear Operating Company and others. The comments herein are a supplement to oral comments made by Rita Kilpatrick, May 10, 2000, before the NRC in Vidalia, Georgia.

CPG is a non-profit conservation and energy consumer organization headquartered in Atlanta with a field office located in Savannah. We are a statewide organization with members throughout Georgia and have focused on energy and nuclear concerns for 17 years.

Area of Vital Ecological Significance

The area where the Hatch nuclear plant is located in Appling County along the banks of the Altamaha River is an area of vital ecological significance to Georgia and the region. The livelihood of hundreds of thousands of people depends on this river and billions of dollars of resources from fisheries, agriculture, tourism, and other coastal activities are at stake here.

Earthquake Zone

One major concern is that Plant Hatch is located in an earthquake zone that threatens the public and the surrounding environment. On Jan. 18, 2000 there was an earthquake with a magnitude of 2.5-4 with the epicenter at Lake Sinclair. According to specialists at the Georgia Institute of Technology, there was no fault but rather a zone of weakness and these shifts occur regularly every 2-4 years. These shifts, in addition to the Charleston earthquake zone, would further threaten the operational integrity of the plant.

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The pool is packed. An indoor high level waste dump.

There is absolutely no way emergency response from the entire State of Georgia could deal with such an accident, let alone the poor little Appling County Fire and Rescue units. Picture it for a moment: reactor melting down, deadly hot radioactive steam everywhere, overhead crane and refueling platform crashing down onto reactor with explosions going on, spent fuel pool going, water streaming from the spent fuel pool, spent fuel rods later becoming a molten, melting blob from hell, people dying everywhere, sirens going off, panicked parents, screaming terrified children, packed dirt side roads and blacktops, an uneducated -radiologically speaking -press corps trying to fly over it for pictures, and, as people in the south in rural areas use CB radios and cell phones, the entire coast trying to leave, plus most of middle Georgia - don't forget Ft. Stewart, and at the Prison probably a riot breaking out as they try to escape too. Washington would be wringing its hands, NRC Atlanta and the State of Georgia would be looking for a Chernobyl type radiation suit none of them possess - maybe they'd ask NRC in DC for one, and they don't have one either. And the children and everything else we love would die. Then the plume would probably head up the eastern seaboard or elsewhere depending on meteorology at the time. More panic, more death, more damage. That aged dump of a facility must be shutdown, soon, forever.

Please put all this also in the Federal Register when you do publish it as people need to understand that children dying from radiation sickness with its bleeding from every orifice, hair fallout, radiation induced vomiting, is just NOT acceptable. Neither are children going blind or will genetic damage. That's what would happen.

The only way the public can be somewhat protected is to shutdown Hatch I and II. Southern should compensate the community of Appling County.

As should the co-owners Georgia Power, Oglethorpe Power and NEAG and the City of Dalton.

Please make the right decision and grant the 2.206, for the sake of the children in particular.

Thank-you.

Pamela Blookay-O'Brien

Copy to: Rita Kilpatrick, CPG, Atlanta, Sara Barozak, CPG, Savannah.

Vulnerability to Hurricanes and Wildfires

A major concern is that every decade in the 50's, 60's, 70's and 80's, a hurricane has crossed South Georgia. The NRC report "Effects of Hurricane Andrew on Turkey Point Nuclear Generating Station (August 20-30, 1992)" shows serious consequences. Also, the severe gridlock that has occurred during hurricane evacuations in Florida is comparable to the type of gridlock that would occur in the event of a catastrophic event surrounding Hatch.

In addition, wildfires pose a threat to the area. At present, there is a wildfire that firefighters are trying to contain near Waycross in South Georgia. As recently occurred at the nuclear facility in Los Alamos, wildfire forced the town and workers to evacuate the area. A similar or worse occurrence at Hatch would force worker evacuation and threaten plant and public safety.

Natural Deterioration of the Plant

The plant is decayed and contaminated at present. This will worsen with time due to the deteriorating effects that radiation has on a nuclear plant. The Hatch reactors have a cracked core shroud, held together by steel braces which become brittle and corroded due to exposure to radiation. These have the potential to snap due to vibration leading to severe problems.

Continuous serious problems at Hatch that included automatic shutdowns (6-15-99, 6-28-99 and 1-26-00) are other examples of major problems, faulty equipment and aging machinery. The aging status of the plant and the lack of aging monitoring are of high concern to public safety.

Added concerns, which CPG supports, are identified in a May 3, 2000 petition filed by the Union of Concerned Scientists regarding aging effects due to radiation, specifically the degradation of liquid and gaseous radwaste systems.

Unacceptable Contamination of Air, Water, and Land

There has already been unacceptable damage and risk to the immediate environment. Extending plant operations will worsen the situation.

During the December 3-4, 1986 spill of 141,500 gallons of highly radioactive contaminated water from the spent fuel pool resulted in 44,000 gallons of that contaminated water released between the reactor buildings and contaminated on-site soils, equipment, asphalt, walls, turbine buildings, control building, hot machine shop, nitrogen storage area among other locations. This was in part due to leaking seals, lack of attention to documented problems, equipment failures, inadequate licensee action, and inoperable leak detection systems, all of which resulted in the highly contaminated water also contaminating the river, sediment, wetlands (swamp) and would have seeped into the groundwater adding to the existing groundwater contamination from numerous prior events. Prior events include the 1979 failure of a pump seal in the condenser tank system that contaminated the local aquifer or the release of radioactive RHR service water system containing Manganese 54, Cobalt 60, Zinc 65, and Xenon 135.

T01

State documents from 1999 confirm that Hatch has contaminated sediments in the Altamaha River. Radioactive contamination of sediments attributed to operations of Hatch have extended as far as Jesup and Darien.

T03

Hatch is situated over a major regional limestone aquifer system of groundwater resources and the surrounding community relies on underground wells; therefore water quality and health are of top concern. One of the local aquifers near the plant is an unconfined Miocene/Pliocene aquifer (Hydrologic Atlas 18).

A June 2, 1995 Inspection Report shows that leaking fuel caused increases in radioactivity in liquid effluent dumped into the Altamaha River in 1994 and increases in particulate forms of radioactivity as gaseous effluents released to the air, including Cobalt 58, Cobalt 60, Zinc 65, Cesium 134, Cesium 137.

T04

The absence of independent analysis on levels of radioactive contamination in the river and waterways is a high concern. Independent analysis is sorely needed. It should be noted that state analysis only involves cross-checking and cannot be considered independent analysis.

T05

The NRC Docket shows the site has become a radioactive dump inadequately held together; for example, the wall thinning and pitting of the piping systems is so bad (resulting from conditions such as but not limited to flow-assisted corrosion and microbiological corrosion and radioactive decay products) that the Southern Company has sought relief to use alternative repair techniques which would result in adding more metals around the pipes to restore wall thickness rather than replacing the pipes, requesting permission to use an ASME-approved code which has not been incorporated into NRC regulatory guide 1.147 and thus is not available for application at nuclear power plants as the Southern Company has stated in its third 10-year interval Request for Relief RR-25.

T06
T20

Detailed inspection reports from 1999 alone showed multiple equipment failures that could have had serious consequences, including meltdown.

The Hatch licensee dumped radioactive contaminated sludge on the land since 1982 without ever surveying the sludge until May 1992, which would have seeped into groundwater (Jan. 8, 1993 Inspection Report). The State of Georgia was negligent as an agreement state in issuing National Pollutant Discharge Elimination System (NPDES) permits for disposing of sludge, which did not address measurements for or content of radioactive material in the sludge.

T07

A practice existed for years of upending radioactive contaminated drums, so that the residue would drain onto the ground from the drums which held radioactive waste oil and water, contaminated the soil and an underground storage tank with Cobalt 60, Manganese 54, Zinc 65, and Cesium 137. Subsequently contaminated soil was removed, but it is unclear where it was taken. Although the contaminated underground storage tank was removed and stored on-site at Hatch, the groundwater and possibly workers would have been contaminated and this issue was never addressed (Special Report 1-sp-80-3 Contaminated Soil at Waste Oil Storage Area).

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The dam on Lake Sinclair owned by the Southern Company was completed in 1953. This is an old dam and would not have been built to current specifications of a modern dam. A severe earthquake could break the dam, which would release a massive amount of water. The effect of dam breakage particularly in times of major flooding on the Oconee, Ocmulgee and Altamaha rivers could have catastrophic consequences not only to Hatch but to the Independent Spent Fuel Storage Installation (ISFSI) for high-level radioactive waste currently constructed next to the Altamaha River.

The NRC has revealed that the ISFSI casks will give off 125 millirems/hr on the side of the cask over pack and 85 millirems/hr on the top. This will stream to the environment and will further add to the radiological burden to people in the area and to the environment, including wildlife and migrating birds, at levels over and above already existing contamination and above daily releases of radioactive contamination to water and air, due to current plant operations.

Goat farms and families with goats located in and around Appling County face added risks because tritium has a high transfer factor (17 times higher for goat milk than for cow milk), according to study done for the U.S. Department of Energy.

Worker Contamination

After years of operation the licensee has problems refueling without contaminating workers and the surrounding site; for example, Mar. 12, 1990 Inspection Report where the particulate airborne Cobalt releases were 5.2 times the already high maximum permissible concentration in air and 17 individuals were contaminated (14 contaminated internally), the contamination events actually started in Aug. 1989 and continued until Jan. 1990 and the contamination of personnel, equipment, and fuel water was significant. Over the years the NRC has repeatedly put concerns in writing due to "the continuing radiological and contamination control deficiencies" yet the NRC has been ineffective in bringing corrective change.

Historic Preservation and Ecologically Significant Sites in the Wind Paths and Surrounding Area

The following, among other local historic and ecologically significant sites, would be lost forever in the event of a catastrophic accident:

- J. Clayton Stephens Museum of Local History located in an adjacent county where local history is assembled;
- The Little Ocmulgee State Park on the Little Ocmulgee River in McRae;
- Horse Creek Wildlife Management Area in the Ocmulgee proper;

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- The Gordonia-Altamaha State Park at Reidsville;
- Altamaha River Bioreserve.

Low-Income Population Impacts

There is not adequate attention to issues surrounding economic justice and the long-term, negative economic implications of Plant Hatch on the community. The area is being contaminated to the extent that the location is made undesirable for future economic development. This will only worsen with extended plant operations.

Unacceptable Fatalities and Injuries in the Event of Serious Accident

If there were a meltdown, there would be an unacceptable number of immediate fatalities and peak early injuries due to radiation and additional unacceptable fatalities and injuries from an accident and meltdown in the radioactive spent fuel pool.

Hatch's aging reactors, spent fuel pool and proposed ISFSI pose unacceptable risks to people, agriculture and fishing in the surrounding area. It would constitute malfeasance and negligence on the part of the NRC to re-license this plant and to allow the storage cask scheme to go forward.

The licensee's analysis of severe accident mitigation alternatives is grossly deficient.

The Brookhaven National Laboratory study done for the NRC in 1997 determined that spent fuel accidents with a full storage pool as exists at Hatch would cause 101 prompt fatalities within a 500-mile distance, 138,000 latent fatalities and 2,170 square miles of land that could never be decontaminated. According to other government documents, reactors of the Hatch GE Mark I type can begin to melt down in as little as 40 minutes due to known design deficiencies.

The lack of a traditional containment dome at Hatch adds to public health and economic risks.

Increased Liability for Local and State Governments

The utility industry is undergoing dramatic change involving deregulation, plant sales, and company mergers that create an unstable and unsafe environment for nuclear plants and the surrounding communities. New companies that may purchase old facilities are often unaware of the historical record at nuclear plants. Southern Company, which operates the plant, is undergoing continual reorganization that heightens uncertainties. The company has encountered notable problems with risky investments in global expansion, as evident in reviewing the company's annual reports and filings with the U.S. Securities & Exchange Commission.

As nuclear companies close down and walk away from radioactively contaminated areas in the future, the liability for clean-up will fall on local governments to deal with the contamination at the site and in the surrounding area. There is no mechanism for remediation or responsibility for dealing with high levels of contamination that will only escalate with continued plant operations in the future and the site could fall to a "third party," most likely the state or municipality. Generation of more waste including the proposed 5000 additional assemblies will exacerbate growing liability to local governments.

Handling of Generic Industry Problems

We have concern that the NRC frequently categorizes problems as generic industry problems. We request that the NRC treat all problems and areas of concern raised about Plant Hatch in this re-licensing proceeding and others as "site specific problems," not generic industry problems.

Inadequate Analysis of Alternatives

The applicant's analysis of alternatives is inadequate and does not consider a viable set of alternatives. Also, the extent of economic analysis done on the alternatives is unclear in the application. Some alternatives are clearly not in the public interest nor the company's economic interest: (1) new coal, (2) new oil, and (3) new nuclear.

The most recent long-range Integrated Resource Plan for Georgia Power Company, approved by the Georgia Public Service Commission, identifies ways that the company plans to secure power supplies in the long term based on future, projected demand. It should be noted that this PSC-approved plan assumes that Hatch reactors will retire according to Hatch's original license in 2014 and 2018.

The applicant has not properly assessed the following renewable energy options:

(1) Wind power options: The applicant states that there are not adequate wind/ land resources in Georgia, and that wind is not an option. Land use maps indicate that the northeast corner of Georgia has small but good sites. It is important to note that throughout the U.S., many good sites are not on any resource maps. When energy developers are asked to find a resource at a reasonable price they seem to find the wind resource. The applicant could also negotiate with other companies to wheel wind power from other states. Off shore is a growing resource.

(2) Solar: The applicant states that solar is too expensive, and that Georgia does not possess adequate resources. The most cost effective photovoltaic (pv) applications are roof top and building integrated where distribution and reliability issues are addressed. Roof top pv and building integrated pv installations have no environmental impact.

(3) Geothermal: Geothermal heat pumps are a viable option in Georgia, already under development, with potential to expand significantly.

T14

(4) Wood energy and biomass: The upgrade of inefficiency of current biomass plants should be considered. Also, agricultural waste, urban wood waste, and methane gas recovery from landfills should be considered.

Renewable energy supplies in combination with energy efficiency and cleaner generation (fuel cells, cogeneration, micro turbines, high efficiency gas, bio-fuels, etc.) can make a major, low cost impact on the applicant's dirty and unsafe generation profile. The do-nothing approach presented in the application is inadequate. There is a clear need to ramp up renewables, efficiency and cleaner generation today if customers future needs are to be met.

T15

Similar to Americans nation-wide, Georgians are asking for clean air and clean water. The applicant parties can make this happen if they use economic leverage to support clean power. Regarding renewable energy programs, CPG urges that the Southern Company and its partners begin participation in the Center for Resource Solutions, a voluntary certification program that requires utility participants to follow specific guidelines that promote renewable resources. The goal of this program is to help regulated utilities offer programs to its customers to meet a high standard of public accountability. The Tennessee Valley Authority, which serves part of Georgia, launched a Green Power Switch program in April 2000 which give its customers the choice of paying a small premium to ensure that some of their electricity comes from non-polluting, renewable energy sources. We believe the applicant can significantly surpass TVA in "green power" development.

T16

Attached herein is an excerpt from the Integrated Resource Plan by Georgia Power Company, filed in the past at the Georgia Public Service Commission for consideration in the company's long-range planning. Several of these programs were never implemented. Although current policy at the Georgia PSC requires a "ratepayer impact measures" screening test for energy efficiency programs to be approved for rate-based customer service programs, the company has in the past and currently has the ability to develop programs that go beyond the screening test. The company has had ample opportunity to develop its own energy-efficient programs for customers outside of rate-based approved programs. Unfortunately, to date, such programs have been designed primarily to build customer electric load which encourage usage at times that bolster nuclear supplies. This load-building effort is detrimental and should be abandoned, along with the pursuit of extended operations at Hatch.

Georgia is exporting power equivalent to that generated by Hatch. No analysis was presented about the contract terms and the potential for retaining the power in the state.

False Claims to be "Environmentally Clean"

The bravado with which the nuclear industry touts that nuclear power is "environmentally clean," including during the public hearings on Hatch re-licensing, requires that the record be set straight

T17

about complaints raised to date. In 1998, the federal Better Business Bureau ruled that advertisements placed by the Nuclear Energy Institute on behalf of the nuclear industry were misleading and that the industry should "discontinue" its "inaccurate" statements. Last year, the Federal Trade Commission also agreed that the industry "failed to substantiate its general environmental benefit claims." Attached herein is the Federal Trade Commission's finding.

Conclusion

Building a safe, affordable and efficient energy supply that provides safe jobs to the area is a top priority.

In closing, we request the following:

- rejection of the licensee's application to extend Hatch's operating life;
- clean-up of the contaminated areas;
- pumping of the radioactively contaminated groundwater;
- retrieval of all particulate radiation, in particular Cobalt 60 in sediment, sub-surface soil, groundwater, and river water both on site and in the Altamaha River and in any adjacent creeks, tributaries, wetlands, and swamps within and without the licensee's protected area;
- decontamination of all equipment, material and buildings on-site;
- adequate compensation of contaminated workers and any of the general public who may have been affected or whose well water may have been affected;
- and irreversible revocation of the plant license;
- a halt of the proposed Independent Spent Fuel Storage Installation.

Respectfully submitted,

Rita Kilpatrick
Executive Director

LETTER U

February 22, 2000
via facsimile 301-415-1759 &
301-415-1222

Director
Nuclear Regulatory Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555

RE: 2.206 Petition

Dear Director:

We are hereby submitting a petition under Section 2.206 of 10 C.F.R. regarding the Edwin I. Hatch nuclear power plant located near Baxley, Georgia in Appling County along the banks of the Altamaha River, an area of vital ecological significance upon which the livelihood of hundreds of thousands of people depend.

This petition is asking for shutdown of the facility, clean-up of the contaminated areas, pumping of the radioactively contaminated groundwater, retrieval of all particulate radiation, in particular Cobalt 60 in sediment, sub-surface soil, groundwater, and river water both on site and in the Altamaha River and in any adjacent creeks, tributaries, wetlands, and swamps within and without the licensee's protected area, decontamination of all equipment, material and buildings on-site, adequate compensation of contaminated workers, and any of the general public who may have been affected or whose wellwater may have been affected, and irreversible revocation of the plant license. Furthermore, the proposed Independent Spent Fuel Storage Installation should be halted for reasons which will be enumerated below.

The bases for this request are as follows:

Poor Personnel Practices

(a) Since the operation of Plant Hatch and its neighbor Plant Vogtle by persons under the influence of cocaine, marijuana, or alcohol in the 1990's is appalling (Inspection Report 50-321/94-23, 50-366/94-23);

Poor Facility Conditions, Maintenance, and Management

(b) Since the facility is decrepit, decayed and contaminated;

U12

U01

U02

Petition 2.206 (cont.)

(c) Since start-up (see reports Nov. 1, 1974 and Feb. 1, 1977), Hatch has had problems with exceeding the technical specifications and lost pieces in the reactor and left them there (Dec. 15, 1975 Georgia Power to NRC);

(d) Since, at start-up, Hatch personnel failed to document test steps and failed to calibrate radiation detectors and since there have been vibration problems (Sept. 19, 1975) and it is unclear if the vibration problems were ever fixed;

(e) Since Hatch was exempted from reporting on the status of the facility 9 months after criticality (March 23, 1979);

(f) Since the cracked core shroud (held together by steel braces) becomes brittle and corroded due to radiation exposure and could snap due to vibration leading to a disaster;

(g) Since a reactor vessel feedwater nozzle inside radius and bore cracking (1974-1980) exacerbates the situation;

(h) Since the Oct. 3, 1994 Inspection Report shows that the Southern Nuclear Company had ignored recommendations concerning looking for weld defects on the core shroud and even reduced inspection criteria; Since NRC inspectors only looked at videotapes of visual examinations of the reactor core shroud which is unacceptable as is the performance of General Electric examiners who wrongly positioned the scanning fixture on the core shroud wells (further problems are detailed in inspection conducted Mar. 25 - Apr. 1 1994);

(i) Since the continuous serious problems at Hatch which included two automatic reactor shutdowns (6-15-99, 6-28-99 and 1-26-00) are other examples of major problems, faulty equipment and aging machinery at Hatch;

Unacceptable Damage and Risk to the Immediate Environment

(j) Since during the December 3-4, 1986 spill of 141,500 gallons of highly radioactive contaminated water from the spent fuel pool resulted in 44,000 gallons of that contaminated water released between the reactor buildings and contaminated on-site soils, equipment, asphalt, walls, turbine buildings, control building, hot machine shop, nitrogen storage area among other locations, in part due to leaking seals, lack of attention to documented problems, equipment failures, inadequate licensee action, and inoperable leak detection systems, all of which resulted in the highly contaminated water also contaminating the river, sediment, wetlands (swamp) and would have seeped into the groundwater massively adding to the existing groundwater contamination from numerous prior events, such as the 1979 failure of a pump seal in the condenser tank system which

Petition 2.206 (cont.)

contaminated the local aquifer or the release of radioactive RHR service water system containing Manganese 54, Cobalt 60, Zinc 65, and Xenon 135;

(k) Since Hatch is situated over a major regional limestone aquifer system of groundwater resources and the surrounding community relies on underground wells and since one of the local aquifers near the plant is an unconfined miocene/pliocene aquifer (Hydrologic Atlas 18);

(l) Since the June 2, 1995 Inspection Report shows that leaking fuel caused increases in radioactivity in liquid effluent dumped into the Altamaha River in 1994 and increases in particulate forms of radioactivity as gaseous effluents released to the air, including Cobalt 58, Cobalt 60, Zinc 65, Cesium 134, Cesium 137;

(m) Since, the Docket shows the site has become a radioactive dump inadequately held together; for example, the wall thinning and pitting of the piping systems is so bad (resulting from conditions such as but not limited to flow-assisted corrosion and microbiological corrosion and radioactive decay products) that the Southern Company is seeking relief to use alternative repair techniques which would result in adding more metals around the pipes to restore wall thickness rather than replacing the pipes, requesting permission to use an ASME-approved code which has not been incorporated into NRC regulatory guide 1.147 and thus is not available for application at nuclear power plants as the Southern Company has stated in its third 10-year interval Request for Relief RR-25;

(n) Since after years of operation the licensee has problems refueling without contaminating workers and the surrounding site; for example, Mar. 12, 1990 Inspection Report where the particulate airborne Cobalt releases were 5.2 times the already high maximum permissible concentration in air and 17 individuals were contaminated (14 contaminated internally), the contamination events actually started in Aug. 1989 and continued until Jan. 1990 and the contamination of personnel, equipment, and fuel water was significant, and over the years the NRC has repeatedly put concerns in writing due to "the continuing radiological and contamination control deficiencies" yet the NRC has been ineffective in bringing corrective change;

(o) Since the Hatch licensee dumped radioactive contaminated sludge on the land since 1992 without ever surveying the sludge until May 1992 which would have seeped into groundwater (Jan. 8, 1993 Inspection Report) and the State of Georgia was negligent as an agreement state in issuing National Pollutant Discharge Elimination System (NPDES) permits for disposing of sludge which did not address measurements for or content of radioactive material in the sludge;

U08

U08

U05

Petition 2.206 (cont.)

Petition 2.206 (cont.)

(p) Since the practice that existed for years of upending radioactive contaminated drums, so that the residue would drain onto the ground from the drums which held radioactive waste oil and water, contaminated the soil and an underground storage tank with Cobalt 60, Manganese 54, Zinc 65, and Cesium 137; Since subsequently contaminated soil was removed, it is unclear where it was taken to, and although the contaminated underground storage tank was removed and stored on-site at Hatch, the groundwater and possibly workers would have been contaminated and this issue was never addressed (Special Report 1-sp-80-3 Contaminated Soil at Waste Oil Storage Area);

(q) Since Hatch is situated in an earthquake zone and on Jan. 18, 2000 there was an earthquake with a magnitude of 2.5-4 with the epicenter at Lake Sinclair and according to specialists at Georgia Tech, there was no fault but rather a zone of weakness and these shifts occur regularly every 2-4 years which, in addition to the Charleston earthquake zone, would further threaten the operational integrity of the plant;

(r) Since the dam on Lake Sinclair is owned by the Southern Company and Lake Sinclair in pounds contains 15,330 acres of water (extending into 3 counties) and construction began in 1929, stopped during the depression, re-started and then stopped during WWII, and was only completed in 1953, it is therefore obvious that this is an old dam and is not being built to current specifications of a modern dam. Since a severe earthquake could break the dam which would release a massive amount of water, the effect of dam breakage in particular in times of major flooding in the Oconee, Ocmulgee and Altamaha rivers could have catastrophic consequences not only to Hatch but to the Independent Spent Fuel Storage Installation (ISFSI) for high-level radioactive waste currently constructed next to the Altamaha River;

(s) Since the NRC's conversation Feb. 1, 2000 with Pamela Blockey O'Brien revealed that the ISFSI casks will give off 125 millirems/hr on the side of the cask overpack and 85 millirems/hr on the top which will stream to the environment and will further add to the radiological burden to people and the environment, wildlife and migrating birds at levels over and above already existing contamination and above daily releases of radioactive contamination to water and air due to current plant operations;

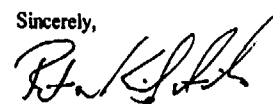
(t) Since radioactive contamination of sediments attributed to operations of Hatch have extended to Jesup and Darien;

(u) Since were there to be a meltdown there would be an unacceptable number of immediate fatalities and peak early injuries due to radiation and additional unacceptable fatalities and injuries from an accident and meltdown in the radioactive spent fuel pool;

We therefore pray and demand that this petition be granted because Hatch's aging reactors, spent fuel pool and proposed ISFSI pose unacceptable risk to people and agriculture and fishing in the surrounding area. We believe it would constitute malfeasance and negligence on the part of the NRC to deny this petition.

Had we been aware that our letter of February 3, 2000 would be taken up by the NRC Petition Review Board as a petition-initiating process, we would have accompanied it with this letter. We reserve the right to supplement the above materials as we deem necessary.

Sincerely,



Rita Kilpatrick
Executive Director, Campaign for a Prosperous Georgia

cc: Leonard Olshan, NRC Petition Review Board
NRC Director of Operations
NRC Docketing and Service Branch

LETTER V

1 to support relicensing of Plant Hatch for the future, for
2 our children and grandchildren.

3 We thank you for listening to us. We think it's
4 a good decision. Without any hesitation I recommend that
5 you relicense Plant Hatch.

6 MR. CAMERON: Thank you, Representative Byrd. I
7 thank all of you who have taken the time out of your
8 schedule to come down and attend this public meeting that
9 we're having today.

10 We're going to go to Rita Kilpatrick now, and
11 when Rita is done we're going to go to Sheriff Parker if
12 he's still here.

13 Rita.

14 MS. KILPATRICK: Good afternoon. I'll introduce
15 myself again. My name is Rita Kilpatrick. I'm the
16 Executive Director of Campaign for a Prosperous Georgia.
17 Our organization is a nonprofit conservation and energy
18 consumer organization. We are headquartered in Atlanta,
19 and we have a field office in Savannah.

20 We are a Statewide organization with members
21 throughout Georgia. And I want to say on a personal note
22 my mother was born in Georgia and the family has been for
23 many generations in the Washington County area in any
24 direction on either side, and this issue is of great
25 importance to me personally as well as professionally.

1 I have worked in the energy field for many years
2 and understand alternatives that are available and what
3 the issues are surrounding nuclear energy as a whole. We
4 have been focusing specifically on Plant Hatch.

5 I want to bring out the fact that this is an
6 area of vital economic significance, and with Plant Hatch
7 located in Appling County along the banks of the Altamaha
8 River, the livelihoods of hundreds of thousands of people
9 depend on the river and the ecology in the area, and
10 billions of dollars of resources from fisheries,
11 agricultural activities, forage, and other coastal
12 activities all are at stake here. Because of
13 the thrust of this hearing today, the environment -- and
14 we connect that to health concerns, and we do have quite a
15 few economic and security issues that we would like to be
16 raised later.

17 One major concern that we have is that Plant
18 Hatch is located in an earthquake zone that threatens the
19 public and the surrounding environment. There have been
20 earthquake activities in the area -- Lake Sinclair of
21 special note -- and I won't dwell on that, but that is a
22 concern to us, as well as earthquake activity in other
23 nearby areas in the region. So we would like for that
24 issue to be taken up and given very serious consideration
25 during this relicensing process.

1 plants that have had to close down early before their
2 initial original license life span was expended. So that
3 is a concern that we have. It is not a good record that
4 we have to work with so far.

5 As mentioned in previous comments by other
6 people, there have been major spills and highly
7 radioactive contaminated water from the spent fuel pool
8 occurring back in 1986, due to a number of problems,
9 leakage seals, lack of attention to documented problems,
10 et cetera, and there are numerous examples that I won't go
11 into today that bring us to look at a level of
12 contamination that exists already and ask where we're
13 headed with this for the future.

14 We recognize that people living in the area need
15 to put on a fairly happy face. It is important for the
16 company itself to appear to be environmentally perfect in
17 some regard, and yet we urge that the actual record be
18 looked at very closely in this case.

19 The plant is situated over a major regional
20 limestone aquifer system that has groundwater resources
21 which we know the surrounding communities rely upon, and
22 therefore that water quality and the health associated
23 with that is a top concern to us. And the particular type
24 of aquifer that this is a special concern.

25 We are concerned also that the NRC frequently

V16

1 We have some concerns about the natural
2 deterioration of the plant. We realize that there will be
3 additional hearings to look at technical issues, and
4 insofar as the condition of the plant in a fairly decayed
5 and contaminated state already, we believe that this is
6 only going to worsen with time and the deteriorating
7 effects that radiation is going to have on the plant of
8 course is a concern.

9 There are situations of forced automatic
10 shutdown that have occurred -- one in mid '99 and, of
11 course, one at the beginning of this year. These are
12 examples of faulty equipment problems, and these have an
13 impact on the environment whereas particular releases
14 occur as a result of the problems. These need to be
15 looked at within the environmental arena.

16 There are quite a few concerns here that I am
17 going to skip over we weren't sure how much time we would
18 be given here, so I want to be as brief as I can.

19 Our analysis of the situation so far tells us
20 that there have already been an unacceptable level of
21 damage and that there and that will worsen as the plant
22 continues operation over time. And I should note that
23 there is no plant anywhere in this country that has
24 operated anywhere near the way Plant Hatch is looking to
25 extend its license toward. There are several examples of

V01

May 2001

A-159

NUREG-1437, Supplement 4

1 categorizes problems as generic industry problems, and we
2 request that y'all treat all the problems and the areas of
3 concern that are raised in this process about Plant Hatch
4 as site-specific problems rather than generic and industry
5 problems. We have been very concerned about the way that
6 these generic problems have been handled and too often
7 cast aside as, "We can't do anything about it; it's a
8 generic problem."

9 I'm trying to not repeat some comments that were
10 made earlier by several people.

11 Issues surrounding the dumping of radioactively
12 contaminated sludge on the land for many years is
13 certainly something that we are not happy about and see as
14 a contamination clean-up issue.

15 The practice of upending the radioactively
16 contaminated drums so that the residue would drain onto
17 the ground from the drums and with drums holding
18 radioactive waste oil and water that were contaminated and
19 would have contaminated the soil and underground storage
20 tank, that is a very serious problem that again needs to
21 be looked at as part of the history here of performance.

22 The dam that is located on Lake Sinclair and its
23 potential impact if it were to break, to look at the
24 condition of that dam and the potential for earthquake
25 activity or other natural events to affect its ability to

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V03

V04

1 keep water contained and avoid flooding, if there were a
2 dam breakage the height at time of flooding, that is
3 something that needs to be looked at and taken into
4 consideration.

5 Of course, the dry cast storage construction
6 underway to the level of radioactivity associated with is
7 that phenomenal and way out of range to what we understand
8 is even within some fairly new standards that fairly
9 exist. And that can be separated out. We can note that
10 was the storage issue that was wholly taken off the list
11 and not considered as an environmental association. In
12 our opinion it does.

13 And if you're looking at continuing to generate
14 high level radioactive waste on site with nowhere to put
15 it except in one of these dry cast storage containers,
16 that the problem with those casts can be multiplied as we
17 keep generating waste and keep moving it.

18 The fact that radioactive contamination of
19 sediment attributed to Plant Hatch operations extends as
20 far as Jesup and Darien. The extent to which
21 contamination has spread is something that clearly needs
22 to be looked at. We have some independent analysis on the
23 level of radioactive contamination which came out in
24 questioning over today. We are concerned about the amount
25 of money that is going into the license renewal process.

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Appendix A

1 We were surprised by the request for waiver, and we felt
2 that it was probably not enough to get into an expensive
3 relicensing review which we feel is needed with the amount
4 of funds that are designated. We are very concerned that
5 with a low amount of funds they will be able to do
6 adequate analysis on the water contamination issue.

7 There are numerous concerns we have with worker
8 contamination which I won't get into. I will comment on
9 that separately at another time.

10 I want to say something -- I can't wrap up here
11 without mentioning -- and with all due respect to the
12 folks, the woman who represented the Institute here in
13 making a statement that the plant does not emit air
14 pollution, I would encourage her and others of you who
15 hold that viewpoint to turn to some information that came
16 out in the past year from the Better Business Bureau,
17 which is a Federal independent bureau, challenging the
18 nuclear industry as a whole on some advertising that it
19 was running. I will just quote very briefly here from the
20 New York Times dated 1998 end of year stated that the
21 nuclear industry changed an ad that the Bureau said
22 falsely claimed that nuclear reactors make power without
23 polluting the air and water or damaging the environment.
24 The Better Business Bureau's national advertising
25 division, which is based in New York, said in its decision

1 today that the industry should stop calling itself
2 environmentally clean and stop saying it makes power
3 without polluting the environment, indicating that these
4 claims are simply not supportable. And we certainly
5 understand that and appreciate the effort that the Better
6 Business Bureau has made to correct some
7 misrepresentations that shouldn't be provided in the first
8 place.

9 I just want to put in a quick note also to the
10 people concerned that there are no alternatives here. I
11 would encourage the company and other companies who co-own
12 this plant to pay attention to pay attention to what the
13 Tennessee Valley Authority is doing. They just unveiled a
14 three power program which is commendable. We would like
15 them to do much more and we believe they can. We know
16 that the Southern Company can surpass what TVA tries to
17 put out there. It's a publicly accountable program, and
18 they work very closely with local environmental
19 organizations to develop. We are eager to see that
20 program scaled up substantially.

21 Just a quick mention of what they are looking to
22 offer a power switch program to residential consumers in
23 blocks of power that are about 12 percent of a typical
24 household's monthly energy use. So that's something to
25 cast aside. We were very concerned when we looked over

1 the Southern Company licensee file on this relicensing
2 with the presentation that the alternatives, especially
3 environmentally clean energy are really not available to
4 us. We wholeheartedly disagree with that and would
5 encourage close attention to other companies that are
6 taking a very strong leadership role, not only in the
7 country but now starting in the Southeast, to develop
8 alternatives. We would like, of course, to see a
9 comprehensive approach to this question of whether it is
10 cost-effective and whether it is environmentally
11 beneficial for this relicensing of Plant Hatch to proceed,
12 in contrast with a comparison to alternatives that are
13 available.

14 And let me make one final comment here in
15 closing. We ask for there to be a look at what clean-up
16 of contaminated area really needs to be done now, and over
17 the future with any extension of the plant operation, what
18 added cost does that bring to clean-up? And what are the
19 situations that could occur down the road? As you know,
20 the electric industry is under deregulation mode, and we
21 have not seen deregulation occur here yet but it could
22 down the road. And the question of what liability this
23 leaves, there are very sweeping, dramatic changes
24 occurring in the industry across the country and across
25 the world in terms of who owns what plants. This plant

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V11

1 may not be owned by the same company that it is now, and
2 what does that mean in terms of liability to the local
3 community and a clean-up that is very much needed now and
4 will be increasingly necessary in the future?

5 We are fearful of particulate radiation that has
6 been released, in particular cobalt-60, which is in the
7 sediment in the river and adjacent creeks and tributary
8 areas, and decontamination of the equipment, material, and
9 buildings on site. And of course going with that,
10 adequate compensation of any contaminated workers, and
11 there have been some documented. And to the general
12 public who may be affected or whose well water has been
13 affected, and to look at the other problems associated
14 with internal spent fuel storage situation.

15 I thank you for the time you have given and we
16 appreciate the opportunity to file some more documents.

17 MR. CAMERON: Thank you, Rita.

18 Is Sheriff Parker here?

19 SHERIFF PARKER: Man, please. I thought I would
20 never get this far. Y'all like to run me off, but I had
21 to stay.

22 I've got my assistant. He's a deputy sheriff.
23 He's also a member of the board of education. I ain't got
24 a whole lot of notes because my daddy used to say if
25 you've got write it down, it's not worth saying most of

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1 Next we will go to Rita Kilpatrick from Campaign
2 for a Prosperous Georgia.

3 MS. KILPATRICK: Good evening. I'll introduce our
4 organization. We are a nonprofit conservation and energy
5 consumer organization. We are headquartered in Atlanta,
6 and we have a field office in Savannah.

7 We are a Statewide organization with members
8 throughout Georgia. We have been in existence for 17
9 years now, working on energy issues, and have a wealth of
10 information and knowledge based on different energy
11 alternatives available to Georgia, some of which have been
12 tapped, some not.

13 We work hard in different areas -- the Public
14 Service Commission -- and occasionally participate in NRC
15 public hearings and proceedings -- and have been very
16 actively involved in the air quality issues that Georgia
17 faces and particularly involved in the clean-up of the
18 coal-fired power plants throughout the State.

19 And I want to say on a personal note my mother,
20 granddaddy, great granddaddy, great-great, and on back --
21 all grew up in South Georgia. This area is very special
22 to me for that reason. Not only in regard to the work
23 that I do but also from a family point of view, I care a
24 lot about what happens here.

25 My organization, I need to state, does not

1 support the license renewal of Plant Hatch, and we do not
2 agree with those who hold the belief that the plant is the
3 best option for supplying energy to the region. We
4 actually would be deceiving the public if I stood up here
5 and said that we believe this plant is operating safely
6 now and has historically operated in safe ways to the
7 public and would in a relicensed future.

8 In looking at energy choices, nuclear plants are
9 in our view the most dangerous and most threatening in
10 terms of risks, not only to the environment but to human
11 health, and, in the long run, to the economy itself.
12 Because this hearing is focused on environmental criteria,
13 environmental factors, we're going to steer clear as much
14 as we can from commenting on the economic and security
15 concerns that we have because we will have an opportunity
16 to raise those later.

17 I had elaborated this afternoon on some areas of
18 concern that we ask the NRC to please address in the
19 relicensing process, so I won't repeat those. They are
20 related to the earthquake zones, the spills that have
21 occurred over time at this plant, and the dumping on land
22 and in areas that should not have been dumped on and the
23 increasing contamination at the site, to be addressing
24 those as well as the natural deterioration of the plant
25 which is inevitable to occur with the aging of the plant

1 and the need for aging monitoring to be going on. We feel
2 that that is extremely important.

3 I ran short of time this afternoon, so I just
4 wanted to bring out a little more on the aquifer issue.
5 We are very concerned and hope that the NRC will assign
6 top priority to the environmental issues area of looking
7 at the fact that Hatch is situated over a major regional
8 limestone aquifer system containing groundwater resources
9 and that that does impact the surrounding community, which
10 relies on underground wells, and to pay attention to one
11 of the local aquifers near the plant, being an unconfined
12 meicene pleiocene aquifer.

13 This afternoon people will standing up and
14 making claims and not referencing any evidence or
15 documents. We can certainly do that. We would be glad to
16 provide that kind of information if anyone feels that some
17 of the concerns we are raising are not substantiated in
18 the documents either provided by the company or by the NRC
19 or the State.

20 We wanted to mention a concern we do have about
21 the continuation of operation at Plant Hatch. Obviously
22 we're very concerned about the fact that the plant has
23 maximized its capacity for spent fuel on site and that it
24 is now being forced to look for other options. We don't
25 feel that the option chosen is a safe one, to set up a dry

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V12

1 cast storage system, including the one that has been
2 selected or which will, by the way, be the first
3 experiment of that in the country, if that goes forward.

4 NRC has revealed that these types of casts will
5 put off 125 millirems per hour on the site of the cast
6 over pack and 85 millirems per hour on the top. There is
7 nothing safe about that. Those levels are phenomenally
8 high, and they are very risky and dangerous to people who
9 are working in the area.

10 This radioactivity will stream into the
11 environment and will further add to the radiological
12 burden to people in the area, as well the environment and
13 wildlife and migrating birds at levels above already
14 existing contamination and above the daily routine
15 releases that occur of radioactive contamination to water
16 and air, due to the plant operation. I just want to
17 emphasize that it has been there is no air emissions here.
18 That's not true. There are, and they need to be looked at
19 and taken into consideration in the relicensing process.

20 Everyone was not here when the question was
21 asked if there would be any consideration given to the
22 local health effects of the radioactive emissions,
23 particularly at Hatch. That is extremely important in our
24 view, and it's a factor that we feel would be fairly
25 obvious to consider in looking at whether or not to grant

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1 relicensing.

2 The other items -- I don't know if worker
3 contamination issues are considered a part of this. They
4 are not. We have a host of concerns in that arena, which
5 we will raise at another opportunity.

6 MR. GRIMES: We had earlier explained that all the
7 health effects issue we believe are adequately covered by
8 the ongoing process, and that's the way that they will be
9 reported in the draft of our impact statement. And you
10 will have another opportunity to raise that issue in the
11 draft of the environmental impact statement, the general
12 concern about worker contamination and public exposure.

13 MS. KILPATRICK: I wanted to make a general statement
14 about our concerns with public health and things that we
15 understand that NRC will do to set standards to protect
16 health. We don't believe that you can make a
17 determination that there is not a significant health
18 impact here or perhaps for any plant that is in your V13
19 jurisdiction. And that is based on a combination of
20 actors, including the fact that we don't see there to be a
21 health basis for the NRC. So that is a concern that we
22 can raise in various other ways.

23 And I want to point out for those of you who
24 were here earlier today who will know what I'm talking
25 about, there were quite a comments -- I was struck by the

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1 number of people who came up here and said, "People are
2 healthy around here, and all we have to do is look at the
3 fact that there is a significant number of Georgia Power
4 employees who have worked at Plant Hatch who are now
5 retired and have chosen to stay in the area. So that's a
6 pretty strong indicator that things must be going fine."

7 And our understanding of the health issues is
8 that it takes time for health problems to really reveal
9 themselves when there is radioactivity in the environment
10 and that it's with ensuing generations where problems are
11 likely to arise, although some can occur in various ways.
12 So it depends on what people are talking about. If you're
13 talking about cancers or people keeling over dying, it's
14 not the situation we're facing in the way of health
15 problems.

16 And it's important to look at women and children
17 as well, and we'd like to see a process for that to be
18 taken up.

19 I want to say a few things about the options
20 here, and I should start out with a comment that was made
21 earlier today by the gentleman who is here with the
22 Nuclear Energy Institute, who had referenced an issue
23 brought up about the Better Business Bureau that has
24 challenged the nuclear industry nationwide as running
25 false advertisements that they are a clean industry,

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1 environmentally clean. I have some information about that
2 and would be glad to share that if you all would like to
3 see it. But I felt that the reply to that from the
4 Nuclear Energy Institute attempted to lay out that the
5 Federal Trade Commission actually came back and said, "You
6 guys are clean. You've got clean air."

7 To get the record straight, I'd be glad to argue
8 or file in the record the FTC's decision, because I feel
9 that was presented in a somewhat slanted way for the
10 people at the hearing here. So we can put that together.
11 Our interpretation is that the FTC came out plainly and it
12 would be misleading for the industry to be presenting
13 itself as environmentally clean. The water contamination
14 is fairly obvious, but there are other areas of
15 contamination that don't mean clean at all.

16 And if we get into comparisons of which is
17 cleaner, coal or nuclear, thus or that, often when the
18 argument comes up, "Well, we can bring clean air and solve
19 the air quality problem here in Georgia with nuclear
20 plants and do that on a nationwide basis." An analogy
21 that is often made to that kind of scenario is that if
22 you're looking at moving to nuclear power as a solution to
23 air pollution that it's comparable to quitting smoking
24 cigarettes and taking up smoking crack. You need to get
25 the big picture to understand and to really present to the

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1 public, this is what the health implications and the
2 environmental implications truly are.

3 We would like to also have it recognized that we
4 believe the options presented for alternative fuel
5 supplies in the company's filing, licensee's filing, and
6 by some commenters here today, do not necessarily reflect
7 the broader energy industry's analysis. There are quite a
8 few options that are becoming commercially feasible.
9 Renewable energy is becoming available in various ways,
10 and to cast it off as a wind issue that will take up a
11 tremendous amount of land or solar being a possibility,
12 this is just very shortsighted, and it's important to look
13 at the new technologies that are available not only from a
14 distributive generation vantage point but also from the
15 broader technology choices that becoming available
16 worldwide.

17 And added to that, energy efficiency has always
18 been a very important potential that Georgia has not
19 tapped. Electricity consumption, as many of you may know,
20 has skyrocketed. It has outpaced population growth in the
21 last couple of decades here in our State by over two and a
22 half times. We don't look good nationwide. It's not a
23 very commendable feature of our energy use and our energy
24 system. We have a lot to do in that area. There are some
25 fairly simple alternatives that may look like they're not

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Appendix A

LETTER W

From: "Michael Mulligan" <stmshvl@together.net>
 To: "HATCHEIS NRC" <HATCHEIS@nrc.gov>
 Date: Thu, Nov 30, 2000 10:05 PM
 Subject: Re: Plant hatch

Mr Kugler

I going to make a 2.206 related meteorology safety issue at another Southern Plant. The gist is; most analysis looks in some past worst historical record as the justification on heat sink or meteorology analysis. I'm asking you specially if Hatch uses-like the regional ; NATIONAL ASSESSMENT The Potential Consequences of Climate Variability and Change-estimation of temperature increase on climate.

The specific question is; Does Hatch plant license renewal use future meteorological estimations of worst case climate changes? Then I would need to know as a generic issue if the rest of the licence renewal would be looking at it this way; and does the NRC mandate that the renewal looks at it this way.

I'm sorry I initially ask you these question in such a confusing manner.

mike

----- Original Message -----

From: "HATCHEIS HATCHEIS" <HATCHEIS@nrc.gov>
 To: <stmshvl@together.net>
 Sent: Thursday, November 30, 2000 4:32 PM
 Subject: Re: Plant hatch

> Mr. Mulligan,

>

> Generally speaking, these are the types of issues we consider during our
 > review. But I will need to sit down with the technical area expert to
 > discuss specifics. This will likely occur around the end of the comment
 > period so that we can go over all comments received.

>

> Andy Kugler
 > (301) 415-2828

>

> >>> "Michael Mulligan" <stmshvl@together.net> 11/28 7:01 PM >>>

> Mr Kugler

> Thank you for your response. Could you tell me if these are new issues which
 > I identified (within Hatch licence renewal program) or would they have been
 > responded by the renewal program.

>

> Thanks

> mike

very important individually, but collectively they make a
 big difference. And those always have to be kept in mind.

We've seen some fairly perverse load-building
 initiatives proposed by the Southern Company to the Public
 Service Commission. And by "perverse," I mean it attempts
 to get people to buy more electricity, and it's not just
 their competition against natural gas and other energy
 supplies but really a need to build up the system so that
 those off-peak kinds of usage can be more fully used, and
 nuclear power plants play into that very significantly.
 There, too, need to be more generation alternatives, and
 it is very important to pay attention to the alternatives.

I want to wind down here by pointing out two
 points regarding the dependency of Appling County and the
 area on Plant Hatch as far as tax base. Between 60 and 70
 percent of the revenue base for the County is fairly
 alarming to us. We have been doing quite a bit of
 research on that and have found reports coming out and
 saying 17 percent reliance on a nuclear plant is too high,
 and it's not a healthy dependency. Where we can assist in
 helping diversity that base so that it's not as highly
 dependent on nuclear in the energy arena, where a system
 built up by other alternatives, we'd be happy to do that

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> ----- Original Message -----
> From: "HATCHEIS HATCHEIS" <HATCHEIS@nrc.gov>
> To: <stmshvl@together.net>
> Sent: Tuesday, November 28, 2000 3:05 PM
> Subject: Re: Plant hatch
>
>
> > Mr. Mulligan,
> >
> > We received your e-mail comments regarding the Hatch license renewal
> > environmental impact statement (EIS). Your comments will be addressed in
> > Appendix A to the final EIS and, as appropriate, in the text of the EIS.
> >
> > Andy Kugler
> > (301) 415-2828
> >
> > > > "Michael Mulligan" <stmshvl@together.net> 11/23 10:15 PM >>>
> > Has the license renewal taken into consideration the recent Global warming
> > projections? Does meteorology take into consideration the future worst
> > case environment effects like droughts, heavy rainfall-for the life of the
> > license. Typically the NRC looks at the worst rear view mirror weather
> > record. What have been the trends; air, water,heat sink- for the last
> > decade on the site, and out for life of the plant? Will the plant(s) have
> > adequate and plentiful plant cooling either-nuclear or non nuclear- and
> > will the heat sink be able to handle the heat addition capacity without
> > damaging the natural heat sink. Or will the river/ pond be
> > able to handle the water withdrawals during a drought, or will the
> > additional heat along with the sewage/ pollution load before or after the
> > plant lead to a reduction in oxygen, such that it damages the ecosystem.
> >
> >
> > mike mulligan
> > 16033367179

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Appendix B

Contributors to the Supplement

Appendix B

Contributors to the Supplement

The overall responsibility for the preparation of this supplement was assigned to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC). The statement was prepared by members of the Office of Nuclear Reactor Regulation with assistance from other NRC organizations and the Pacific Northwest National Laboratory. Representatives from Argonne National Laboratory, Idaho National Engineering and Environmental Laboratory, and Lawrence Livermore National Laboratory also participated in this review.

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(a) Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute.		
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(b) Argonne National Laboratory is operated for the U.S. Department of Energy by the University of Chicago.		

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Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Southern Nuclear Operating Company's Application for License Renewal of Edwin I. Hatch Nuclear Plant, Units 1 and 2

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Southern Nuclear Operating Company's Application for License Renewal of Edwin I. Hatch Nuclear Plant, Units 1 and 2

This appendix contains a chronological listing of correspondence between the NRC and the Southern Nuclear Operating Company (SNC) and other correspondence related to the NRC staff's environmental review, under 10 CFR Part 51, of SNC's application for renewal for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, operating licenses. All documents, with the exception of those containing proprietary information, have been placed in the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD, and are available electronically from the Public Electronic Reading Room found on the Internet at the following web address: <http://www.nrc.gov/NRC/ADAMS/index.html>. From this site, the public can gain access to the NRC's Agencywide Document Access and Management Systems (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records (PARS) component of ADAMS.

February 29, 2000	Letter from Southern Nuclear to NRC forwarding the application for renewal of operating licenses for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, requesting extension of operating licenses for an additional 20 years
March 24, 2000	Letter from NRC to Southern Nuclear transmitting determination of acceptability and sufficiency for docketing, proposed review schedule, and opportunity for a hearing regarding an application from SNC for renewal of the operating licenses for Units 1 and 2 of the Edwin I. Hatch Nuclear Plant
April 4, 2000	Letter from NRC to Southern Nuclear forwarding Federal Register Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping in support of the review of the license renewal application
April 12, 2000	Notice of public meeting to discuss environmental scoping process for Edwin I. Hatch Nuclear Plant, Units 1 and 2, license renewal application
April 28, 2000	Letter from Jeff Baxley, Baxley City Manager, to NRC regarding the environmental scoping process for Hatch license renewal

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May 1, 2000	Letter from Cathryn Meehan, President, Southeastern Technical Institute, to NRC regarding the environmental scoping process for Hatch license renewal
May 8, 2000	Letter from J. Edward Tyson, President, Darby Bank and Trust Co., to NRC regarding the environmental scoping process for Hatch license renewal
May 22, 2000	Letter from Southern Nuclear to NRC transmitting additional information supporting license renewal environmental report
May 26, 2000	Letter from Bill Mitchell, President of Toombs-Montgomery Chamber of Commerce, to NRC regarding the environmental scoping process for Hatch license renewal
May 29, 2000	Letter from Pamela Blockey-O'Brien, Fellowship of Reconciliation, to NRC regarding the environmental scoping process for Hatch license renewal (supplemental statement)
I May 30, 2000	Letter from the Honorable Tommie Williams, Senator, State of Georgia, to NRC regarding the environmental scoping process for Hatch license renewal
May 30, 2000	Letter from NRC to Southern Nuclear transmitting request for additional information related to the staff's review of severe accident mitigation alternatives for the Edwin I. Hatch Nuclear Plant, Units 1 and 2
June 4, 2000	Letter from Pamela Blockey-O'Brien to NRC regarding the environmental scoping process for Hatch license renewal (supplemental statement)
June 5, 2000	Letter from Dusty Gres, Director, Ohoopsee Regional Library System, to NRC regarding the environmental scoping process for Hatch license renewal
June 7, 2000	Letter from Pamela Blockey-O'Brien to NRC regarding the environmental scoping process for Hatch license renewal (supplemental statement)
I June 8, 2000	Letter from the Honorable Greg Morris, Representative, State of Georgia, to NRC regarding the environmental scoping process for Hatch license renewal

June 8, 2000	Summary of scoping meeting held in support of the environmental review of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 license renewal application	
June 9, 2000	Letter from Deborah Shephard, Executive Director, Altamaha Riverkeeper, to NRC regarding the environmental scoping process for Hatch license renewal	
June 9, 2000	Letter from Rita Kilpatrick, Executive Director, Campaign for a Prosperous Georgia, to NRC regarding the environmental scoping process for Hatch license renewal	
June 12, 2000	Summary of site audit to support review of the Hatch license renewal application	I
June 23, 200	Letter from NRC to Southern Nuclear transmitting request for additional information related to the staff's review of the license renewal environmental report for the Edwin I. Hatch Nuclear Plant, Units 1 and 2	
July 7, 2000	Letter from NRC to Deborah Sheppard in response to an environmental scoping comment for Hatch license renewal	
July 26, 2000	Letter from Southern Nuclear to NRC transmitting additional information related to the staff's review of the severe accident mitigation alternatives	
August 11, 2000	Letter from Southern Nuclear to NRC transmitting additional information related to the staff's review of the license renewal environmental report for Edwin I. Hatch Nuclear Plant, Units 1 and 2	
August 23, 2000	Letter from NRC to Southern Nuclear transmitting Environmental Scoping Summary Report associated with the staff's review of the application by Southern Nuclear Operating Company for Renewal of the operating licenses for the Edwin I. Hatch Nuclear Plant, Units 1 and 2	
August 31, 2000	Letter from NRC to Charles A. Oravetz, National Marine Fisheries Service, transmitting biological assessment for license renewal at Edwin I. Hatch Nuclear Power Plant, Units 1 and 2, and request for informal consultation on shortnose sturgeon	

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August 31, 2000	Letter from Southern Nuclear to NRC transmitting additional information related to the staff's review of severe accident mitigation alternatives
October 17, 2000	Letter from Rita Kilpatrick, Executive Director, Georgians for Clean Energy, to NRC, transmitting attachments associated with her June 9, 2000 letter regarding the environmental scoping process for HNP license renewal
October 25, 2000	Letter to Southern Nuclear from NRC requesting comment on the draft plant-specific supplement to the GEIS regarding HNP license renewal
October 26, 2000	Letter to the Appling County Library from NRC transmitting the draft plant-specific supplement to the GEIS for HNP license renewal
October 31, 2000	Letter to Southern Nuclear from NRC transmitting notice of availability of the draft plant-specific supplement to the GEIS regarding HNP license renewal
October 31, 2000	Letter to US EPA from NRC forwarding the draft Supplement 4 to the GEIS regarding HNP license renewal
November 7, 2000	Notice of public meeting to accept comments on the draft supplement to the GEIS regarding HNP license renewal
December 10, 2000	Letter from Pamela Blockey-O'Brien to NRC regarding the draft environmental impact statement for HNP license renewal
December 12, 2000	Written statement from David Kyler, Center for a Sustainable Coast, to NRC regarding the draft environmental impact statement for HNP license renewal
December 15, 2000	Letter from Lewis Sumner, SNC, to NRC providing the annual update to the license renewal application for HNP
December 18, 2000	Letter from Merriam Bass, M.K. Pentecost Ecology Trust Fund, to Chairman Merserve, NRC, regarding proposed re-licensing of HNP (an identical letter, with the same date, was sent to Mr. Luis Reyes, NRC Region II)

December 31, 2000	Letter from Joan O. King to NRC providing comments on proposed re-licensing of HNP
January 2, 2001	Letter to Mr. Mike Mulligan from NRC regarding comments on the HNP license renewal review
January 17, 2001	Letter from James Lee, Department of Interior, to NRC providing comments on the draft SEIS for HNP license renewal
January 19, 2001	Letter from Gary Drury, Georgia Coast Watch, to NRC providing comments on proposed re-licensing of HNP
January 22, 2001	Letter from David Waller, Georgia Department of Natural Resources, to NRC providing comments on the draft SEIS for HNP license renewal
January 23, 2001	Letter from Lewis Sumner, SNC, to NRC providing comments on the draft SEIS for HNP license renewal
January 24, 2001	Letter from Sara Barczk, Georgians for Clean Energy, to NRC providing comments on the draft SEIS for HNP license renewal
January 25, 2001	Summary of the December 12, 2000, public meeting in Vidalia, Georgia, held to discuss the results of the environmental review of the license renewal application for HNP
January 29, 2001	Letter from Andreas Mager, Jr., National Marine Fisheries Service (NMFS), Southeast Regional Office, to NRC providing comments on the draft SEIS for HNP license renewal
February 3, 2001	Memorandum from Andy Kugler (NRC) to Michael Lesar, Rules and Directives Branch (NRC), transmitting e-mail comments received concerning the draft SEIS for HNP license renewal
February 6, 2001	Letter from Heinz Mueller, Environmental Protection Agency, Region 4, to NRC providing comments on the draft SEIS for HNP license renewal
February 8, 2001	Letter to Merriam Bass, M.K. Pentecost Ecology Trust Fund, from NRC acknowledging receipt of comments and stating NRC's intention to address the comments in Appendix A of the SEIS for HNP license renewal

Appendix C

- February 20, 2001 Letter to Charles Oravetz, NMFS, from NRC inquiring about status of informal consultation for a listed species in relation to HNP license renewal
- March 8, 2001 Letter from Lewis Sumner, SNC, to NRC providing additional information related to the SEIS for HNP license renewal
- | April 25, 2001 Letter from Lewis Sumner, SNC, to NRC providing an update to the
| biological status as a result of the March 22, 2001, meeting.
- | May 14, 2001 Summary of Public Exit Meeting Regarding National Marine Fisheries
| Service and Fish and Wildlife Service Concerns Related to the Edwin I.
| Hatch Nuclear Plant, Units 1 and 2, License Renewal Application

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

During the course of the staff's independent review of environmental impacts from operations during the renewal term, the following Federal, State, regional, and local agencies were contacted:

Appling County Heritage Center, Baxley, Georgia

Baxley/Appling County Chamber of Commerce and Development Authority, Baxley, Georgia

City Manager, City of Baxley, Georgia

Department of Public Works, City of Baxley, Georgia

Department of Social Services, Appling County, Baxley, GA

Georgia Department of Family Services, Baxley, Georgia

Georgia Department of Natural Resources, Environmental Protection Division, Brunswick, Georgia

Georgia Department of Natural Resources, Historic Preservation Division, Atlanta, Georgia

Georgia Department of Natural Resources, Wildlife Resources Division, Social Circle, Georgia

Land Management Group (Realtor), Baxley, GA

Manager, Appling County, Baxley, Georgia

National Archaeological Database: <http://web.cast.uark.edu/other/nps/nadb/nadb.mul.html>

National Register of Historic Places: <http://www.nr.nps.gov/>

National Marine Fisheries Service, St. Petersburg, Florida

ReMax Reality, Vidalia, GA

Salvation Army, Vidalia, GA

Tom Peterson Realty, Vidalia, GA

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Toombs County Chamber of Commerce, Vidalia, GA
Toombs County Economic Development Vidalia, Georgia

University of Georgia State Archaeological Site Files, Athens, Georgia

University of Georgia, Hargrett Rare Book and Manuscript Library, Athens, Georgia

University of Georgia, Science Library Map Collection, Athens, Georgia

U.S. Fish and Wildlife Service, Athens, Georgia

Appendix E

Southern Nuclear Operating Company's Compliance Status and Selected Consultation Correspondence

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Appendix E

Southern Nuclear Operating Company's Compliance Status and Selected Consultation Correspondence

As part of Southern Nuclear Operating Company's (SNC's) application for renewal of its operating licenses for Units 1 and 2, they prepared a list of licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities pertinent to Edwin I. Hatch Nuclear Plant (HNP) operations. The list is shown in Table E-1.

Consultation correspondence prepared and sent during the evaluation of the application for renewal of the operating license for the HNP, Units 1 and 2 follows Table E-1.

- Letter from NRC to Charles A. Oravetz, National Marine Fisheries Service, dated August 31, 2000, transmitting biological assessment for license renewal at E.I. Hatch Nuclear Power Plant, Units 1 and 2, and request for informal consultation on shortnose sturgeon (TAC Nos. MA8330 and MA8332).
- Letter from NRC to Charles A. Oravetz, National Marine Fisheries Service, dated February 20, 2001, requesting the status of the informal consultation regarding the shortnose sturgeon.

Appendix E

Agency	Authority	Requirements	HNP Number	Issue Date	Expiration Date	Remarks
CoE	Federal Clean Water Act (Section 404, 33 USC 1344)	Maintenance Dredging Permit	940003870	03/19/95	09/31/04	The permit authorizes periodic dredging in the Altamaha river at the HNP intake structure.
CoE	Rivers and Harbors Appropriation Act of 1899 (Section 10, 33 USC 407) Clean Water Act (Section 404, 33 USC 1344)	Permit for Construction of a Weir	199101536	04/08/93	02/01/03	The permit authorizes construction of a temporary water retaining wall structure (weir) in the Altamaha River near the HNP intake structure. The weir would be placed in the river on in the event of an extreme low-flow situation in the river, after supplemental flows from upstream reservoirs are near exhaustion.
GADNR	Georgia Groundwater Use Act, (Georgia Laws 1972 et seq., as amended by Georgia Laws 1973, et seq.)	State Groundwater Use Permit	001-0001	12/16/97	12/04/04	The permit authorizes withdrawal of groundwater from 4 wells ^(a) for use at HNP sanitary facilities, process water, central water supply, and makeup water for a wildlife habitat pond.
GADNR	Georgia Water Quality Control Act, (Georgia Law 1964, et seq.)	State Surface Water Withdrawal Permit	001-0690-01	12/16/97	01/01/10	Permit authorizes withdrawal of surface water from the Altamaha for cooling water at HNP.
EPA; GADNR	Federal Clean Water Act (33 USC 1251 et seq.); Georgia Water Quality Control Act, (Georgia Law 1964, et seq.)	Individual Discharge Permit	GA 0004120	09/15/97	08/31/02	Permit contains effluent limits for HNP combined plant waste streams, including sanitary wastewater, cooling water, and cooling tower blowdown. SNP would have to submit a renewal application to GADNR no later than 180 days beyond the expiration date to receive authorization to discharge beyond the expiration date of August 31, 2002.
EPA; GADNR	Federal Clean Water Act (33 USC 1251 et seq.); Georgia Water Quality Control Act, (Georgia Law 1964, et seq.)	Stormwater Discharge Permit	GAR000000	06/01/98	05/31/03	The permit covers all discharges of storm water associated with industrial activities. SNC would have to notify GADNR before new storm water discharges from sites where industrial activity will occur.

(a) SNC added two wells for a total of six authorized wells (SNC, December 15, 2000).

Table E-1. (contd)

Agency	Authority	Requirements	HNP Number	Issue Date	Expiration Date	Remarks
EPA; GADNR	Federal Safe Drinking Water Act [42 USC 300(f) et seq., 40 CFR Parts 100-149]; Georgia Safe Drinking Water Act of 1997, Chapter 391-3-5	Public water system, production	PG0010005	03/21/91	03/21/01 ^(a)	The permit authorizes withdrawal of groundwater from 2 wells for use as drinking water at HNP.
EPA; GADNR	Federal Safe Drinking Water Act [42 USC 300(f) et seq., 40 CFR Parts 100-149]; Georgia Safe Drinking Water Act of 1997, Chapter 391-3-5	Public water system, recreation site	NG0010011	02/07/95	02/06/05 ^(a)	The permit authorizes withdrawal of groundwater from one well for use at the HNP recreation area.
EPA; GADNR	Resource Conservation and Recovery Act (Solid Waste Disposal Act) (42 USC 6901 et seq.); Georgia Solid Waste Management Act, Section 1486, Georgia Laws of 1972 as amended, Chapter 391-3-4	Solid waste landfill, phase II.	001-004 D(L)(I)	09/12/80	Upon Closure	Imposes restrictions on activities at the HNP landfill.
EPA; GADNR	Federal Clean Air Act, as amended, (42 USC 7401 et seq., (40 CFR 50-99); GA Air Quality Act, Section 12-9-1, et seq. and the Rules, Chapter 391-3-1	Air Quality	4911-001-0001-V-01-0	02/04/99	02/04/04	The permit applies to the following units: Auxiliary Startup Boiler Number 2 Two diesel engine fire pumps Five for emergency diesel generators One Security power diesel generator.
NRC	10 CFR Part 50	NRC license, HNP Unit 1	DPR-57	08/06/74	08/06/14	None
NRC	10 CFR Part 50	NRC license, HNP Unit 2	NPF-5	06/13/78	06/13/18	None

CFR = Code of Federal Regulations.

CoE = U.S. Corps of Engineers.

EPA = U.S. Environmental Protection Agency.

GADNR = Georgia Department of Natural Resources.

HNP = Edwin I. Hatch Nuclear Plant.

NRC = U.S. Nuclear Regulatory Commission.

USC = United States Code.

(a) Permits renewed - issue date 4/01/99, expiration date 3/31/09.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 31, 2000

Charles A. Oravetz, Assistant Regional Administrator
Southeast Regional Office
National Marine Fisheries Service
9721 Executive Center Drive
St. Petersburg, FL 33702

**SUBJECT: BIOLOGICAL ASSESSMENT FOR LICENSE RENEWAL AT E. I. HATCH
NUCLEAR PLANT, UNITS 1 AND 2 AND REQUEST FOR INFORMAL
CONSULTATION (TAC NOS. MA8330 AND MA8332)**

Dear Mr. Oravetz:

The NRC staff has prepared the enclosed biological assessment to evaluate whether the proposed renewal of the Edwin I. Hatch Nuclear Power Plant, Units 1 and 2 operating licenses for a period of an additional 20 years would have adverse effects on a listed species. This biological assessment is for the Hatch Nuclear Power Plant, located on the Altamaha River at river kilometer (rkm) 180, in Appling County, Georgia, slightly southeast of the U.S. Highway 1 crossing of the Altamaha River.

The shortnose sturgeon, *Acipenser brevirostrum*, was considered in this biological assessment. The staff has determined that the proposed action is not a major construction activity and that it may affect, but is not likely to adversely affect the shortnose sturgeon. No designated critical habitat for this listed species is located near the proposed action. We are placing this biological assessment in our project files and are requesting your concurrence with our determination.

In reaching our conclusion, the NRC staff relied on information provided by the licensee, on the geographical information system (GIS) data base information provided by the Georgia Natural Heritage Program, on research performed by the NRC staff, and on current listings of species provided by St. Petersburg, Florida office of the National Marine Fisheries Service.

C. Oravetz

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If you have any questions regarding this biological assessment or the staff's request, please contact the environmental project manager, Jim Wilson, by telephone at (301) 415-1108 or by e-mail at jhw1@nrc.gov

Sincerely,

/RA/ Signed by Barry Zalcman for

Cynthia A. Carpenter, Chief
Generic Issues, Environmental, Financial
And Rulemaking Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure: As stated

cc w/ enclosure: See next page

**BIOLOGICAL ASSESSMENT OF THE POTENTIAL IMPACT ON
SHORTNOSE STURGEON RESULTING FROM AN
ADDITIONAL 20 YEARS OF OPERATION OF THE
EDWIN I. HATCH NUCLEAR POWER PLANT, UNITS 1 AND 2**

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

August 2000

I. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is considering renewal of the operating licenses for the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (HNP) for a period of an additional 20 years. The purpose of this assessment is to provide information to the U.S. National Marine Fisheries Service concerning the impacts of continued operation of the HNP on the shortnose sturgeon, *Acipenser brevirostrum*. The assessment summarizes plant information and existing data and discusses the consequences of the proposed action for the shortnose sturgeon. Based on life history information, siting and operational characteristics of the plant, existing data for impingement and entrainment, and the known thermal plume characteristics, the continued operation of the HNP during the proposed 20-year license renewal period may affect, but is not likely to adversely affect, the shortnose sturgeon.

II. PROJECT DESCRIPTION

The proposed action includes the continued operation and maintenance of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 on the Altamaha River in southeastern Georgia under a renewed licence from the NRC. HNP Unit 1 began commercial operation December 31, 1975, and is currently licensed to operate through August 6, 2014. HNP Unit 2 began commercial operation September 5, 1979, and is currently licensed to operate through June 13, 2018. NRC regulations (10 CFR Part 54) allow license renewal for periods of up to 20 years, which would extend the operation of Unit 1 through August 6, 2034, and extend the operation of Unit 2 through June 13, 2038. All facilities associated with this action were constructed during the early 1970s and no new construction will be performed as part of the license renewal action.

III. DESCRIPTION OF PROJECT AREA

A. General Plant Information

The HNP is a steam-electric generating facility operated by Southern Nuclear Operating Company (SNC). HNP is located in Appling County, Georgia, at river kilometer (rkm) 180, slightly southeast of the U.S. Highway 1 crossing of the Altamaha River. It is approximately 11 miles north of Baxley, Georgia; 98 miles southeast of Macon, Georgia; 73 miles northwest of Brunswick, Georgia; and 67 miles southwest of Savannah, Georgia (Figure 1).

HNP is a two-unit plant. Each unit is equipped with a General Electric Nuclear Steam Supply System that utilizes a boiling-water reactor with a Mark I containment design. Both units were originally rated at 2,436 megawatt-thermal and designed for a power level corresponding to approximately 2,537 megawatt-thermal. Both units are now licensed for 2,763 megawatt-thermal. HNP uses a closed-loop system for main condenser cooling that withdraws from and discharges to the Altamaha River via shoreline intake and offshore discharge structures. Descriptions of HNP can be found in documentation submitted to the NRC for the original operating license and subsequent license amendments. Georgia Power Company (GPC) submitted environmental reports for the construction stage and operating license stage for HNP in 1971 and 1975, respectively (References 1 and 2). In 1972, the Atomic Energy Commission (AEC)^a issued a Final Environmental Statement (FES) for Units 1 and 2.

^a. Predecessor agency to NRC.



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(Reference 3), and in 1978, NRC issued a FES for Unit 2 (Reference 4). The FESs evaluate the environmental impacts from plant construction and operation in accordance with the National Environmental Policy Act (NEPA).

The property at the HNP site totals approximately 2,240 acres and is characterized by low, rolling sandy hills that are predominantly forested. A property plan is shown in Figure VI-3. Figure VII-4 provides a more detailed site plan. The property includes approximately 900 acres north of the Altamaha River in Toombs County and approximately 1,340 acres south of the River in Appling County. All industrial facilities associated with the site are located in Appling County. The restricted area, which comprises the reactors, containment buildings, switchyard, cooling tower area and associated facilities, is approximately 300 acres. Approximately 1,600 acres are managed for timber production and wildlife habitat.

B. Heat Dissipation System

The excess heat produced by HNP's two nuclear units is absorbed by cooling water flowing through the condensers and the service water system. Main condenser cooling is provided by mechanical draft cooling towers. Each HNP circulating water system is a closed-loop cooling system that utilizes three cross-flow and one counter-flow mechanical-draft cooling towers for dissipating waste heat to the atmosphere.

For both Units 1 and 2, cooling tower makeup water is withdrawn from the Altamaha River through a single intake structure. The intake structure is located along the southern shoreline of the Altamaha River and is positioned so that water is available to the plant at both minimum flow and probable flood conditions (Figure 2). The main river channel (thalweg) is located closer to the northern shoreline. The intake is approximately 150 feet long, 60 feet wide, and the roof is approximately 60 feet above the water surface at normal river level. The water passage entrance is about 27 feet wide and extends from 16 feet below to 33 feet above normal water levels. Large debris is removed by trash racks, while small debris is removed by vertical traveling screens with a 3/8 inch mesh. Water velocity through the intake screens is 1.9 feet per second (fps) at normal river elevations and decreases at higher river flows.

End
Note 1

Water is returned to the Altamaha River via a submerged discharge structure that consists of two 42-inch lines extending approximately 120 feet out from the shore at an elevation of 54 feet mean sea level. The point of discharge is approximately 1,260 feet down-river from the intake structure and approximately 4 feet below the surface when the river is at its lowest level.

The National Pollutant Discharge Elimination System (NPDES) Permit for HNP, issued by the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (GA DNR) in 1997 requires weekly monitoring of discharge temperatures, but does not stipulate a maximum discharge temperature or maximum temperature rise across the condenser. Maximum discharge temperatures measured at the mixing box, which are reported to EPD on a quarterly basis, range from 62 °F in winter to 94 °F in summer.

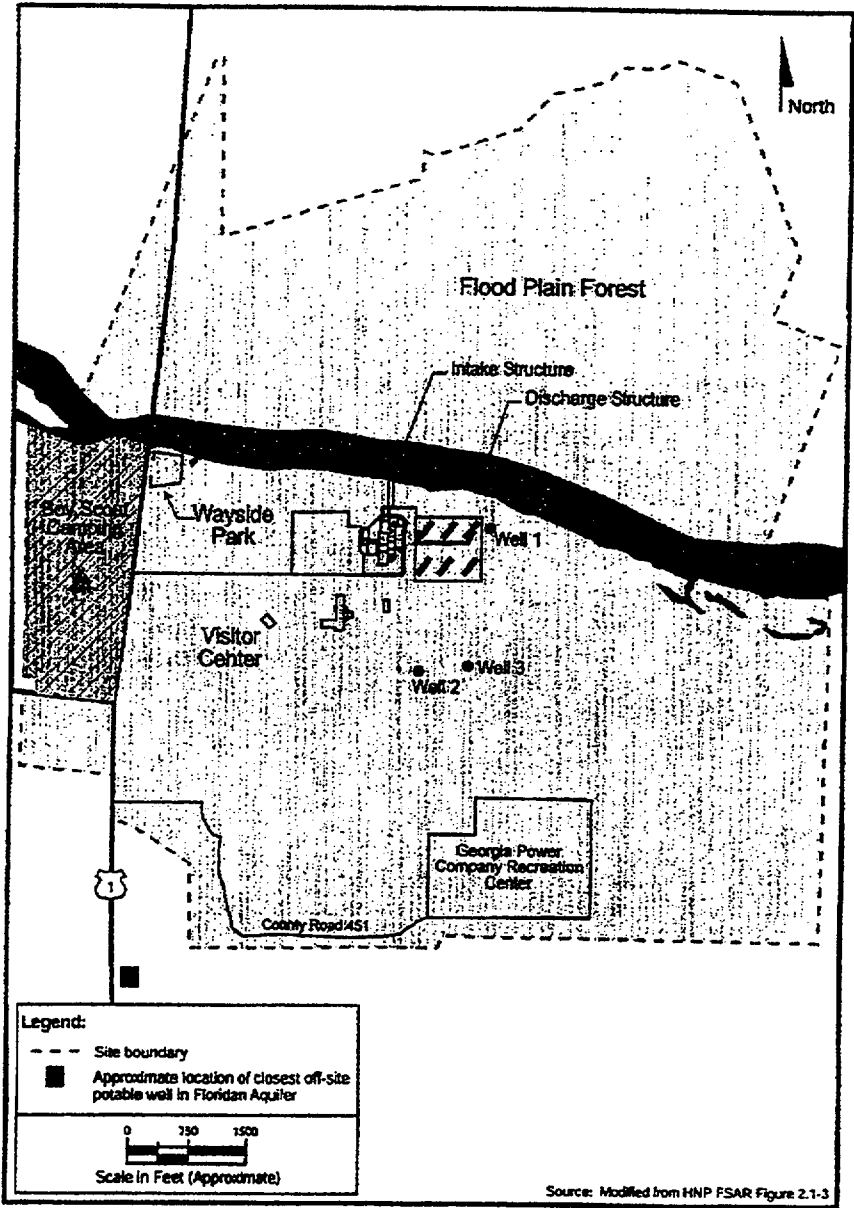


Figure 2 - Plant Hatch Site Plan

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C. Surface Water Use

The Altamaha River is the major source of water for the plant. Water is withdrawn from the River to provide cooling for certain once-through loads and makeup water to the cooling towers. SNC is permitted to withdraw a monthly average of up to 85 million gallons per day with a maximum 24-hour rate of up to 103.6 million gallons. As a condition of this permit, SNC is required to monitor and report withdrawals. HNP withdraws an annual average of 57.18 million gallons per day (88 cubic feet per second [cfs]).

The evaluation of surface water use in the FES concluded that the consumptive losses would be approximately 46 percent of the total water withdrawn from the River. In its environmental assessment for an extended power uprate, the NRC staff concluded that the necessary increase in makeup water to support the higher heat load would be insignificant and that cooling tower blowdown would decrease by approximately 626 gallons per minute (1.4 cfs). Consumptive water use for the plant operating at the extended power level is expected to be 57 percent of the total withdrawal.

The thermal discharge plume has been modeled using the Motz-Benedict model for horizontal jet discharges. The predictive thermal plume model was field verified during 1980 following commencement of Unit 2 operation (Reference 5). Twelve thermal plume monitoring surveys were conducted during 1980 and compared to model predictions. During each of the twelve surveys, temperatures were taken at depths of one foot, three feet, and five feet. All temperatures measurements were made from a boat moving along a pre-selected transects in the river using a temperature probe and continuous recorder. Monitoring equipment was calibrated in the laboratory before each survey and rechecked in the field before and after each survey. The average projected fully mixed excess temperature under average summer conditions (average river flow of 3000 cfs, ΔT of 4.7 °F) is 0.09 °F. During the 1980 field surveys, the period of lowest river flow and greatest cooling tower heat rejection (3220 cfs, and ΔT of 4.5 °F, respectively) resulted in a fully mixed excess temperature of 0.05 °F. The NRC modeled average expected thermal conditions and extreme thermal conditions under conservative assumptions in the Unit 2 Final Environmental Impact Statement (FES) (Reference 4). In that environmental statement, the NRC noted the small size of the thermal plume even under the conservative assumptions, and concluded thermal blockage in the Altamaha River from the plant discharge was not possible.

To control biofouling of cooling system components such as condenser tubes and cooling towers, an oxidizing biocide (typically sodium hypochlorite or sodium bromide) is injected into the system as needed to maintain a concentration of free oxidant sufficient to kill most microbial organisms and algae. When the system is being treated, blowdown is secured to prevent the discharge of residual oxidant into the river. After biocide addition, water is recirculated within the system until residual oxidant levels are below discharge limits specified in the NPDES permit.

IV. STATUS REVIEW OF SHORTNOSE STURGEON

A. Life History

The shortnose sturgeon, *Acipenser brevirostrum*, is a member of the family Acipenseridae, a long-lived group of ancient anadromous and freshwater fishes. The species is currently known by at least 19 distinct population segments inhabiting Atlantic coast rivers from New Brunswick, Canada to northern Florida (Reference 6). Most shortnose sturgeon populations have their greatest abundance in the estuary of their respective river (Reference 7). The species is protected throughout its range.

The distribution of shortnose sturgeon strongly overlaps that of the Atlantic sturgeon, but life histories differ greatly between the two species. The Atlantic sturgeon is truly anadromous with adults and older juveniles spending large portions of their lives at sea. Shortnose sturgeon, however, are restricted to their natal streams. Shortnose sturgeon are not known to move among or between different river drainages (References 8 and 6).

Seasonal migration patterns and some aspects of spawning may be partially dependent on latitude. In northern rivers, shortnose sturgeon move to estuaries in summer months. In southern rivers, movement to estuaries usually occurs in winter (Reference 6). Shortnose sturgeon spawn in freshwater like the Atlantic sturgeon, but then return to the estuaries and spend much of their lives near the fresh/salt water interface. Fresh tidewaters and oligohaline areas serve as nurseries for shortnose sturgeon (Reference 9). Availability of spawning and rearing habitats may be limited throughout the range of shortnose sturgeon (Reference 7).

Shortnose sturgeon exhibit faster growth in southern rivers, but will reach larger adult size in northern rivers (Reference 6). Thus, shortnose sturgeon will reach sexual maturity (45-55 cm FL, [Reference 7]) at a younger age in southern rivers. Spawning by individual fish may only occur at intervals with frequencies of a few to several years. Dadswell, et al. (Reference 10) composed a detailed summary of the known biology of shortnose sturgeon.

Rivers of the deep south are on the edge of the natural range of the shortnose sturgeon and present somewhat unique problems for the species. The majority of southern rivers and estuaries regularly reach temperatures unfavorable to shortnose sturgeon. Intolerant of saline environments and limited to riverine habitats, shortnose sturgeon must seek thermal refuges during most summers in the south. The refuges are found in lower river reaches and consist usually of a few deep holes, possibly cooled by springs or seeps. The fish concentrated in a few of these thermal refuges quickly exhaust local food supplies and appear to just be surviving the summer (Reference 9). A life history that restricts the species to individual drainages, combined with seasonally restricted use of habitats, may be directly related to the species' current endangered status. Sturgeons have long been commercially important species, which may be a leading cause in their rapid decline worldwide. For more than a century, Atlantic and shortnose sturgeon populations were subjected to extensive fishing, likely contributing to the massive population declines along the east coast (Reference 6). Prior to 1900, sturgeon catches were averaging over 3.0 million kg per annum, but this harvest was sustained for less than a decade. Prior to the closure of most east coast fisheries during the 1980s, catches had decreased to less than 1% of historical levels (Reference 11).

Although the shortnose sturgeon was severely overharvested in the past, the greatest threats to survival presently include barriers to its spawning grounds created by dams, loss of habitat for other life history stages, poor water quality, and incidental capture in gill net and trawl fisheries targeting other species (References 8 and 10). Shortnose sturgeon was listed as endangered in 1967 by the U.S. Fish and Wildlife Service. In 1974, the National Marine Fisheries Service reconfirmed this decision under the Endangered Species Act of 1973 (References 8 and 6).

B. Status in Altamaha River

The Altamaha River is large, with the largest watershed east of the Mississippi River. The Altamaha River is located entirely within the state of Georgia. It flows over 800 km from its headwaters to the Atlantic Ocean. The main body of the Altamaha is formed by the confluence of the Oconee and Ocmulgee rivers in the central coastal plain at Altamaha rkm 212 (Reference 8).

The incidences of catch and overharvest of sturgeons from Georgia rivers paralleled the trends of other states. From 1888 through 1892, sturgeon catches in Georgia averaged 71,000 kg per annum (Reference 12). "As recently as 49 years ago, a dealer in Savannah (GA) was shipping 4,500 kg of carcasses per week (6,500 kg in the round) during the peak three to five weeks of the spring run" (Reference 12). Similar harvests were recorded from the Altamaha River (Reference 9).

Catch rate data for sturgeons in Georgia are just as startling. In 1880, and average seasonal catch was 100 fish per net. During a 20-year period from the late 1950s through the late 1970s, net fishermen in the lower Altamaha River caught just 1.1 to 3.2 fish per net per season (Reference 13, as presented in Reference 9). These data indicate a 97-99% decline in the sturgeon fishery (Reference 9).

There is a continuing high demand for sturgeon roe and flesh. From 1962 to 1994 the source of the majority of sturgeon catches has shifted among the Savannah, Ogeechee, and Altamaha rivers. The Altamaha River has been the focus of a "much-throttled" fishery from 1982 to present. Certain recent events have kept prices for sturgeon products high or rising, fueling commercial fisheries and some poaching (Reference 11). Some of these events were an increasing US domestic demand for all seafood products, decreased supplies of sturgeon products as fisheries closed in the US, and sturgeon stocks worldwide were becoming more depleted by overharvest and habitat degradation, particularly in the republics of the old Soviet Union (Reference 11).

The Altamaha River population of shortnose sturgeon has been the focus of much recent research to assess abundance and distribution, determine migration patterns, and describe habitat utilization. Some authors suggested the Altamaha River population of shortnose sturgeon was in better shape than the population in the Savannah River, Georgia-South Carolina (Reference 11). Another study indicated shortnose sturgeon in the Altamaha River may be experiencing lower juvenile mortality rates than in the Ogeechee River, Georgia (Reference 7). The Shortnose Sturgeon Recovery Team indicated that the Altamaha River population was the largest and most viable population south of Cape Hatteras, North

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Carolina (Reference 6). Relative abundance data from one sampling station during 1986-1991 appear to demonstrate a relatively stable population with little trend in the abundance of juveniles (Reference 9).

Telemetry studies have revealed much information about the seasonal migrations of shortnose sturgeon in the Altamaha River and the importance of certain habitats. During summer in the Altamaha River, most fish ages 1+ and older are concentrated at or just upstream of the fresh/salt water interface in physiological refugia. Cooling water temperatures in the fall spur a movement of all sizes of fish to generally more saline waters. Some adult and most large juvenile fish move back to fresh tidewater near the end of autumn to overwinter with little movement or activity. In preparation for spawning in late winter-early spring, some adults will move upstream to locations near spawning sites. The majority of adults and a few large juveniles remain in oligohaline waters near the fresh/salt water interface and may be very active (Reference 8).

Several suspected spawning sites for shortnose sturgeon have been located within the Altamaha River system. Much of the spawning activity occurs in a 70-kilometer section of the Altamaha River centered about Doctortown, Georgia. Spawning is also suspected in the lower Ocmulgee River, which is several kilometers upstream of the shoals marking the transition to the upper coastal plain (Reference 8). This reach is about 40 rkm upstream of HNP.

Suspected spawning areas in the Altamaha River system were often adjacent to river bluffs with gravel, cobble, or hard rock substrate (Reference 11). Shortnose sturgeon eggs are demersal and adhesive after fertilization, sinking quickly and adhering to sticks, stones, gravel, and rubble on the stream bottom.

Shortnose sturgeon, especially juveniles, appear severely restricted to certain habitats near the fresh/salt water interface of the lower Altamaha River. During summers when the water temperature exceeds 28 °C, the fish are further restricted to a few deep holes near the interface. Recaptures of tagged fish indicate that the fish move little and lose weight during this time, which indicates the oversummering habitat is very important, and that food resources may be quickly exhausted (Reference 9). Flournoy, et al. (Reference 9) proposed that shortnose sturgeon were using a few deep holes in the lower Altamaha as physiological refuges, and that these holes may constitute critical habitat. They further hypothesized that the Altamaha River population of shortnose sturgeon existed only because the physiological refugia were available.

The Shortnose Sturgeon Recovery Team has identified numerous factors that may affect the continued survival and potential recovery of the species. Some of these factors may be habitat degradation or loss from dams, bridge construction, channel dredging, and pollutant discharges, as well as mortality from cooling water intake systems, dredging, and incidental capture in other fisheries (Reference 6). Recent evidence of illegal directed take of shortnose sturgeon in South Carolina indicate that poaching may also be a significant source of mortality (Reference 7).

All of the above factors may contribute to mortality in shortnose sturgeon populations, and the significance of each may vary with latitude and individual circumstances. However, the prevailing evidence seems to indicate, at least for the Altamaha River, that the primary threats to the population

Appendix E

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are commercial harvest and limited oversummering habitat. Dahlberg and Scott (Reference 14) recognized that shortnose sturgeon were often caught in gill nets by shad fishermen in the Altamaha River. The threat of bycatch remains real as many of the individual shortnose sturgeon used in recent studies were captured or recaptured with shad fishing gear. Rogers, et al. (Reference 11) stated that at least one of their tagged fish released in the estuary was captured in commercial shad gear, and six of the 36 individuals telemetered were initially collected with shad gear. Even if the fish are recognized as protected shortnose sturgeon and returned to the river, the capture may result in abandonment of spawning activity (Reference 7).

Several authors suggested the Altamaha River population of shortnose sturgeon may be healthier than the Savannah River population (Reference 8). Both rivers have discharges of similar magnitude and neither is dammed below the fall line. Both the Savannah and Altamaha are moderately industrialized, including paper mills and nuclear generating stations along their reaches from the fall line to the coast. Only the Savannah, however, is heavily altered and industrialized in its estuarine zone (Reference 11).

Previous research has shown shortnose sturgeon ages one year and older aggregate in the Altamaha River at or just upstream of the fresh/saltwater interface during the summer. These fish appear to move downstream into more saline water at the end of summer. During late fall and early winter, movement to less saline water occurs and some adults may move upstream toward spawning areas. Spawning is thought to occur during February through March. Some spawning fish move downstream immediately, while others remain upstream (Reference 8).

C. Low Potential for HNP to affect Shortnose Sturgeon

Biological, hydraulic, and physical factors affect the rates of impingement and entrainment. The shortnose sturgeon's known behavior and use of the Altamaha River indicates a low potential for impingement or entrainment with the cooling water for HNP. The low potential for impingement or entrainment is further reduced by siting, design, and operational characteristics of HNP. This is discussed in greater detail, below.

Available literature suggests there is little opportunity for shortnose sturgeon eggs or larvae to encounter the cooling water intakes at HNP. Much of the available spawning habitat for shortnose sturgeon in the Altamaha River is well downstream of HNP. Eggs and larvae from these spawning locations are not available for entrainment by HNP.

There is a suspected spawning area in the lower Ocmulgee River about 40 rkm upstream from HNP, but entrainment of eggs or larvae from this site is also unlikely. Fertilized shortnose sturgeon eggs sink quickly and adhere tightly to rough substrates, even under high flow conditions. Shortnose sturgeon larvae seek bottom cover quickly upon hatching and seldom stray from cover (Reference 15). The larvae grow quickly and are able to maintain bottom contact without being swept downstream (Reference 15), and may linger near the spawning area for the first year of life (Reference 6). Some authors, after attempting to capture shortnose sturgeon larvae, speculated the larvae of shortnose sturgeon, contrary to larvae of Atlantic sturgeon, do not spend much time in the drift (References 16 and 17). These early life history behaviors suggest a very low potential for entrainment effects at HNP.

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The location of the cooling water intake at HNP should further reduce the potential for entrainment and impingement. The intake structure was constructed flush with the shallow, southern shoreline of the Altamaha River. The deep river channel (thalweg) hugs the northern bank opposite of the intake structure. Literature indicates that shortnose sturgeon migrate along the bottom of river channels, often seeking the deepest water available. This behavior and the cooling water intake location on the shoreline opposite the river channel should minimize the probability of shortnose sturgeon encountering the intake structure.

Entrainment and impingement effects are also a function of withdrawal rates, which are reduced for facilities with closed cycle cooling systems in comparison to once through cooling systems. HNP is operated using 3 mechanical draft cooling towers per unit as described in Section III B of this assessment. Cooling towers have been suggested as mitigative measures to reduce known or predicted entrainment and impingement losses (see, for example, Reference 18). EPA has endorsed closed cycle cooling towers as the "best available technology" for minimizing entrainment and impingement mortality (Reference 19). The relatively small volumes of makeup and blowdown water needed for closed-cycle cooling systems result in concomitantly low entrainment, impingement, and discharge effects. In the GEIS for license renewal (Reference 20), the staff noted that studies of intake and discharge effects of closed-cycle cooling systems have generally judged the impacts to be insignificant.

D. Existing Monitoring Data for HNP

This section briefly describes the methods and results of previous studies conducted at HNP. Initial preoperational surveys were conducted at HNP as required by the Unit 1 and 2 Final Environmental Statement (Reference 3) to "perform preoperational measurements of aquatic species to establish base-line data". During these surveys, one adult shortnose sturgeon was collected by gill net on March 13, 1974, in the vicinity of HNP. Three additional specimens of *Acipenser* sp. (two juveniles and one larva) were collected but could not be identified to species (Reference 4). No adult, juvenile, or larval shortnose sturgeon were collected during subsequent impingement and entrainment sampling conducted following startup of either Unit 1 or Unit 2.

End
Note 2

Preoperational drift surveys were conducted weekly from February through May in 1973, and every 6 weeks June through December 1973. Samples were collected at four quadrates for transect above and below the plant intake and two locations close to the plant intake. Typical sample sets consisted of 14 individual samples from 15-minute collections. Drifting organisms were collected with a one-meter diameter 000-mesh nylon plankton net, set 6-12 inches above the river bottom. Samples were washed into a quart container and preserved with formalin.

Cataostomids, cyprinids, and centrarchids were the dominant ichthyoplankton families collected. Commercially important fish in these collections included *Alosa sapidissima* eggs, with mean densities approaching 0.3 per 1000 m³ in March. *Alosa sapidissima* larvae were present in drift samples from May through June, with the density never exceeding 0.03 individuals per 1000 m³. A sturgeon larva was collected during this sampling and sent to Dr. Donald Scott for identification of species, but could not be identified beyond the genus *Acipenser*. This is the only record of larval sturgeon found in the vicinity of HNP.

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Entrainment samples at HNP were collected for the years 1975, 1976, and 1980 following unit startup. Samples were collected weekly during 1975 and 1976, and monthly in 1980 (Reference 21). Additional ichthyological drift data are available for 1974 (weekly collection) and 1979 (monthly collection), but were not used in summarizing entrainment rates. Monthly entrainment data for each taxa for 1975, 1976 represent entrainment estimates for Unit 1 operation. The 1980 data include entrainment estimates for Unit 1 and Unit 2 operation. There was no increase in fish eggs and larvae entrainment at HNP with both units operating. The differences in numbers of fish eggs and larvae reported in the studies are due to differences in species abundance from year to year, spawning activity upstream from the plant, river discharge, and time of year. No sturgeon larvae were found in any entrainment samples collected during operational monitoring.

The entrainment estimates assume a uniform distribution of fish eggs and larvae, while the cross section measurements suggest that the greater densities would occur in the channel furthest from the intake. Under normal flow and pumping conditions, the intake velocity is 1.9 fps. The measured range of intake velocities was from 0.3 fps to 2.7 fps. Estimated percent of river flow entrained in Plant Edwin I. Hatch cooling water has remained less than one percent with the exception of the months of July, August, and September, 1980. The increase in estimated percent flow entrained during this period was due to extremely low river elevations resulting from the lack of rainfall.

Impingement data are available for five years, including 1975, 1976, 1977, 1979, and 1980. Impingement samples include weekly samples in 1975, 1976, and 1977 and monthly samples for 1979 and 1980. Each sample represents impingement for at least a 24-hour period. A total of 165 fish representing 22 species were collected. The highest number impinged per year, 61 fish, was in 1975, while the lowest, 14 fish, was in 1980. The data indicate low impingement estimates per day and per year. The 1975 estimates are 1.2 fish per day and 438 per year; 1976 estimates are 0.4 fish per day and 146 per year; 1977 estimates are 1.1 fish per day and 401.5 per year; 1979 estimates are 1.3 fish per day and 474.5 per year; and 1980 estimates are 1.2 fish per day and 438 per year. The hogchoker, *Trinectes maculatus*, was the most abundant and the only species collected consistently each year. Most species were collected only once during the five years. No sturgeon were collected in impingement samples during five years of sampling. In addition, no adult sturgeon has been reported impinged by the intake structure during the operation of the plant.

E. Comparison with other power generation facilities

The staff has performed an assessment (Reference 22) of the potential impact of the of operation of the Delaware River nuclear power plants, Salem 1 and 2 (once-through) and Hope Creek 1 (closed cycle), and concluded that plant operation was unlikely to adversely affect shortnose sturgeon. This conclusion was based on a combination of life history information, plant siting considerations, and engineering design to mitigate potential adverse impacts (Reference .

The Hudson River, New York, supports a large sturgeon population including both shortnose and Atlantic species. There are six fossil-fueled and one nuclear electricity generating plants located along the Hudson River, and much research has been conducted to address

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impingement and entrainment concerns. Results for entrainment and impingement at the power generation facilities Bowline, Indian Point, and Roseton have been recently summarized for the period from 1972 through 1998 (Reference 17). These three facilities withdraw 62% of the maximum permitted water withdrawal from this reach of the Hudson River. Bowline Units 1 and 2 are two fossil fuel steam electric plants with combined capacity of 1200 MWe and utilize an intake structure located on an embayment off of the Hudson River. The maximum pumping rate is 384,000 gpm. Indian Point Units 2 and 3 are separate pressurized water reactors with combined capacity of 2042 MWe utilizing two separate shoreline intake structures. Predicted condenser cooling water flow rates are 840,000 gpm and 870,000 gpm for Indian Point Units 2 and 3, respectively. Roseton is a two-unit fossil-fueled steam electric plant with combined capacity of 1248 MWe and utilizes a shoreline intake structure. Maximum pumping rate is 641,000 gpm. Unlike HNP, all three of these facilities use once-through cooling. For comparison, the maximum pumping rate for HNP is 72,000 gpm. The GEIS for license renewal (Reference 20) notes that "Water withdrawal from adjacent bodies of water for plants with closed-cycle cooling systems is 5 to 10 percent of that for plants with once-through cooling systems, with much of this water being used for makeup of water by evaporation." The operation of the HNP cooling system is consistent with this description.

One of the environmental impacts identified for the three facilities on the Hudson River is entrainment and impingement of aquatic organisms, including striped bass, white perch, Atlantic tomcod, American shad, bay anchovy, alewife, blueback herring, and spottail shiner. Other species were considered, including Atlantic sturgeon (*Acipenser oxyrinchus*) and shortnose sturgeon. No shortnose sturgeon eggs or larvae were collected in entrainment samples for these facilities over periods ranging from 5 to 14 years. As a result, entrainment effects on shortnose sturgeon are believed to be negligible.

Adult shortnose sturgeon, however, were collected in impingement samples at these facilities. Indian Point Unit 2 reported shortnose sturgeon in impingement samples for 10 of 19 years reported (ranging from 1 to 6 individuals per year). Indian Point Unit 3 reported shortnose sturgeon in impingement samples for 7 of 15 years reported (ranging from 1 to 3 individuals per year). The size of impinged shortnose sturgeon ranged from 12 to 18 inches. The low rate of impingement and the return of impinged fish to the Hudson River alive lead to the conclusion that impingement effects were negligible (Reference 17). Even though sampling has documented large numbers of affected fish at intakes along the Hudson River, and a large resident population of sturgeon exists, shortnose sturgeon are a very small component of the impingement and entrainment numbers (Reference 17). In fact, some recent research suggests that the shortnose sturgeon population in the Hudson River has increased during the last ten years and is now more numerous than the commercially exploited Atlantic sturgeon (Reference 23).

The use of closed cycle cooling minimizes water withdrawals from the Altamaha River. As a result, the probability is much lower of impinging shortnose sturgeon, particularly when compared to similarly situated facilities using once-through cooling systems. In addition, the existing monitoring data support the finding that no impacts are known to occur to shortnose sturgeon from entrainment and impingement at HNP.

V. CONCLUSION

There are no construction modifications of the intake structure, effluent pipes, or changes in operation proposed for the license renewal period for HNP, therefore, the proposed project is not a major construction activity. The proposed project is not located near designated critical habitat of the shortnose sturgeon. Based on the life history characteristics of shortnose sturgeon, siting and operational characteristics of the plant, existing data for impingement and entrainment, and the known thermal plume characteristics, the continued operation of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 during the proposed 20-year license renewal period may affect, but is not likely to adversely affect, the shortnose sturgeon, *Acipenser brevirostrum*.

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Appendix E

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End Notes for the August 31, 2000, Letter

These end notes were added for the appendix and are not part of the original letter.

Note 1- The licensee provided corrected information on approach and screen velocities in its April 25, 2001 letter. The value for the screen velocity during normal river flow conditions is actually around 0.72 fps.

Note 2- The adult shortnose sturgeon that was caught by a gill net was caught in the river channel (i.e., away from the intake structure).

Appendix E

February 20, 2001

Mr. Charles A. Oravetz, Assistant Regional Administrator
Southeast Regional Office
National Marine Fisheries Service
9721 Executive Center Drive
St. Petersburg, FL 33702

SUBJECT: STATUS OF INFORMAL CONSULTATION FOR LICENSE RENEWAL AT
EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 (TAC NOS. MA8330 AND
MA8332)

Dear Mr. Oravetz:

On August 31, 2000, the U.S. Nuclear Regulatory Commission (NRC) staff submitted a biological assessment to your office, initiating an informal consultation. The biological assessment evaluated whether the proposed renewal of the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, operating licenses for a period of an additional 20 years would have adverse effects on a listed species.

I request that you provide us with your best estimate for the completion of the informal consultation. Discussions have been ongoing between the NRC staff and your staff. In the meantime, the NRC staff is continuing the development of an environmental impact statement for the renewal of the HNP licenses. Under the current schedule, the staff expects to complete development of the final environmental impact statement in April and to issue it to the Environmental Protection Agency in early June.

We will continue to work with your staff to resolve any concerns related to the proposed action. If you have any questions, please contact Andy Kugler at (301) 415-2828.

Sincerely,
/RA/Signed By: CACarpenter
Cynthia A. Carpenter, Chief
Generic Issues, Environmental, Financial
and Rulemaking Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Letter ML No.: ML010520188

cc w/enclosure: See next page

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Appendix F

GEIS Environmental Issues Not Applicable to the Edwin I. Hatch Nuclear Plant, Units 1 and 2

Appendix F

GEIS Environmental Issues Not Applicable to the Edwin I. Hatch Nuclear Plant, Units 1 and 2

The following table lists those environmental issues listed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999),^(a) and 10 CFR Part 51, Subpart A, Appendix B, Table B-1, that are not applicable to the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, because of plant or site characteristics.

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered salinity gradients	1	4.2.1.2.2 4.4.2.2	HNP's cooling system does not discharge to an estuary.
Altered thermal stratification of lakes	1	4.4.2.2	HNP's cooling system does not discharge into a lake.
Water-use conflicts (plants with once-through cooling systems)	1	4.3.2.1 4.4.2.1	HNP does not use a once-through heat dissipation system.
AQUATIC ECOLOGY (FOR PLANTS WITH ONCE-THROUGH AND COOLING POND HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	2	4.3.3	This issue is related to heat dissipation systems that are not installed at HNP.
Impingement of fish and shellfish	2	4.3.3	This issue is related to heat dissipation systems that are not installed at HNP.
Heat shock	2	4.3.3	This issue is related to heat dissipation systems that are not installed at HNP.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. In this document, all references to the "GEIS" include the GEIS and its Addendum 1.

Appendix F

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
GROUNDWATER USE AND QUALITY			
Groundwater-use conflicts (potable and service water, and dewatering; plants that use <100 gpm)	1	4.8.1.1 4.8.2.1	HNP uses > 100 gpm of groundwater.
Groundwater-use conflicts (Ranney wells)	2	4.8.1.4	HNP does not have or use Ranney wells.
Groundwater quality degradation (Ranney wells)	1	4.8.2.2	HNP does not have or use Ranney wells.
Groundwater quality degradation (saltwater intrusion)	1	4.8.2.1	HNP is not in an estuary or oceanic area.
Groundwater quality degradation (cooling ponds in salt marshes)	1	4.8.3	HNP does not use a cooling pond heat dissipation system.
Groundwater quality degradation (cooling ponds at inland sites)	2	4.8.3	HNP does not use a cooling pond heat dissipation system.
TERRESTRIAL RESOURCES			
Cooling pond impacts on terrestrial resources	1	4.4.4	HNP does not use a cooling pond heat dissipation system.

F.1 References

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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BIBLIOGRAPHIC DATA SHEET

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Same as 8 above

10. SUPPLEMENTARY NOTES

Docket Numbers 50-321, 50-366

11. ABSTRACT (200 words or less)

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC by Southern Nuclear Operating Company (SNC) to renew the operating licenses for Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, for an additional 20 years under 10 CFR Part 54. This SEIS includes the staff's analysis that considers and weighs the environmental effects of the proposed action, the environmental effects of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse effects. It also includes the staff's recommendation regarding the proposed action.

The NRC staff recommends that the Commission determine that the adverse environmental impacts of license renewal for HNP, Units 1 and 2, are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2) the Environmental Report submitted by SNC; (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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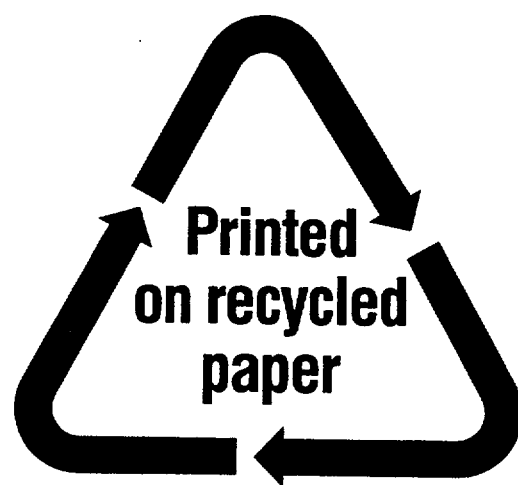
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