8.0 Environmental Impacts of Alternatives to Operating License Renewal

This chapter examines the potential environmental impacts associated with denying the renewal of the operating licenses (OLs) (i.e., the no-action alternative), the potential environmental impacts from electric generating sources other than North Anna Power Station, Units 1 and 2, the possibility of purchasing electric power from other sources to replace power generated by Units 1 and 2 and the associated environmental impacts, the potential environmental impacts from a combination of generating and conservation measures, and other generation alternatives that were deemed unsuitable for replacement of power generated by Units 1 and 2. The environmental impacts were evaluated using the U.S. Nuclear Regulatory Commission's (NRC's) three-level standard of significance–SMALL, MODERATE, or LARGE–developed using the Council on Environmental Quality guidelines and set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

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 impact categories evaluated in this chapter are the same as those used in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999)[a] with the additional impact categories of environmental justice and transportation.

8.1 No-Action Alternative

NRC's regulations implementing the National Environmental Policy Act (NEPA) (42 USC 4321) specify that the no-action alternative be discussed in an NRC EIS [10 CFR Part 51, Subpart A, Appendix A(4)]. For license renewal, the no-action alternative refers to a scenario in which the NRC would not renew the North Anna Power Station, Units 1 and 2, OLs, and the Virginia Electric and Power Company (VEPCo) would then decommission North Anna, Units 1 and 2, when plant operations cease. Replacement of North Anna, Units 1 and 2, electricity generation

(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.

capacity would be met by (1) demand-side management and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than North Anna Power Station, Units 1 and 2, or (4) some combination of these options.

VEPCo will be required to comply with NRC decommissioning requirements whether or not the OLs are renewed. If the North Anna Power Station, Units 1 and 2 OLs are renewed, decommissioning activities may be postponed for up to an additional 20 years. If the OLs are not renewed, VEPCo would conduct decommissioning activities according to the requirements in 10 CFR 50.82.

The environmental impacts associated with decommissioning under both license renewal and 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 the *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities* (NRC 1988).[a] The impacts of decommissioning after 60 years of operation are not expected to be significantly different from those occurring after 40 years of operation.

The environmental impacts for the socioeconomic, historic and archaeological resources, and environmental justice impact categories are summarized in Table 8-1 and discussed in the ensuing paragraphs. The no-action alternative would also have certain positive impacts in that adverse environmental impacts associated with current operation of North Anna Power Station, Units 1 and 2, for example, solid waste impacts and effects on aquatic life, would be eliminated.

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

Impact Category	Impact	Comment
Socioeconomic	SMALL to MODERATE	Decrease in employment, higher-paying jobs and tax revenues. Most adverse impacts would be on Louisa County.
Historic and Archaeological Resources	SMALL	Land occupied by Units 1 and 2 could be developed after decommissioning.
Environmental Justice	SMALL to MODERATE	Loss of employment opportunities and social programs, particularly in Louisa County.

- Socioeconomic: When North Anna Power Station, Units 1 and 2, cease operation, there will be a decrease in employment and tax revenues associated with the closure. These impacts

(a) The NRC staff is supplementing NUREG-0586 for reactor decommissioning. In October 2001, the staff issued draft Supplement 1 to NUREG-0586 dealing with Decommissioning of Nuclear Power Reactors (66 FR 56721, NRC 2001a) for public comment. The staff is currently finalizing the draft Supplement for publication as a final document.

would be felt in Henrico, Orange, and Spotsylvania Counties, and the City of Richmond. Louisa County would be more adversely impacted than the other counties in both employment and tax revenue. Most secondary employment impacts and impacts on population would also be felt in the preceding locations. Approximately 80 percent of the employees who work at North Anna Power Station, Units 1 and 2, live in these counties.

The no-action alternative would result in the loss of the taxes attributable to North Anna Power Station, Units 1 and 2, as well as the loss of plant payrolls 20 years earlier than if the OLs were renewed. As previously mentioned, most of the tax revenue losses resulting from closure of North Anna Power Station, Units 1 and 2, would occur in Louisa County. In 2000, VEPCo paid $10.58 million in property taxes to Louisa County for the nuclear generation units at North Anna, or about 42 percent of all property taxes collected by the County (see Table 2-15).[a] For the remaining two counties to which property taxes are paid, the loss in real property tax would not be significant, amounting to 1.2 and 1.4 percent for Orange and Spotsylvania Counties, respectively, in 2000.

Loss of the property tax revenue could have a significant, short-term negative impact on the ability of Louisa County to provide public services such as schools and road maintenance. There could also be an adverse, short-term impact on housing values, the local economy in Louisa County and surrounding areas, and employment if North Anna Power Station, Units 1 and 2, were to cease operations.

VEPCo employees working at North Anna Power Station, Units 1 and 2, currently contribute time and money toward community involvement, including schools, churches, charities, and other civic activities. It is likely that with a reduced presence in the community following decommissioning, community involvement efforts by VEPCo and its employees in the region would be reduced.

The degree and extent of such adverse impacts would depend on the economic development taking place in Louisa County and the other counties and cities over the next 20 years. If the Richmond area continues its growth and diversification into the first quarter of the 21st century as it has for the last decade, and assuming that the economic growth spills over to surrounding counties such as Louisa, Spotsylvania, and Orange, then the consequences of not renewing the OLs could be partially or entirely offset by the new jobs created by such growth. While many of the jobs from past economic development are higher-paying, white-collar positions (e.g., banking and financial service centers), it is not known if these types of jobs and the pay scale of the projected employment increase will be maintained. If the new jobs are skilled, higher-paying jobs, then the impacts of nonrenewal of the North Anna

(a) Information obtained during an interview of Ms. Nancy Pleasants, Commissioner of Revenue, Louisa County October 15, 2001.

Power Station, Units 1 and 2, OLs could be significantly mitigated, and the socioeconomic consequence of plant closure would be SMALL. If the jobs are less-skilled and lower-paying, then the impact of plant closure could be only partially offset and impacts could be MODERATE, particularly in Louisa County.

- Historic and Archaeological Resources: The potential for future adverse impacts to known or unrecorded cultural resources at North Anna following decommissioning of Units 1 and 2 will depend on the future use of the land occupied by the two units. Following decommissioning, land occupied by Units 1 and 2 would likely be retained by VEPCo for other corporate purposes, including potential development of the site given its location on Lake Anna. Eventual sale or transfer of the land occupied by Units 1 and 2, however, could result in adverse impacts to cultural resources if land-use patterns of the site, and lands surrounding the site, change dramatically. Notwithstanding this possibility, the impacts of this alternative on historic and archaeological resources are considered SMALL.

- Environmental Justice for No-Action: Current operations at North Anna Power Station, Units 1 and 2 have no disproportionate impacts on the minority and low-income populations of the surrounding counties, and no environmental pathways have been identified that would cause disproportionate impacts. Closure of Units 1 and 2 could result in decreased employment opportunities in Henrico, Orange, and Spotsylvania Counties and the City of Richmond, with Louisa County potentially seeing the greatest impact. Real property tax revenues lost in Louisa County would be large, with possible negative and disproportionate impacts on minority or low-income populations depending on the County's ability to continue providing services to these populations. The environmental justice impacts under the no-action alternative are considered SMALL to MODERATE.

Impacts for all other impact categories would be SMALL, as shown in Table 9-1.

8.2 Alternative Energy Sources

This section discusses the environmental impacts associated with alternative sources of electric power to replace the power generated by North Anna Power Station, Units 1 and 2, assuming that the OLs for Units 1 and 2 are not renewed. The order of presentation of alternative energy sources in Section 8.2 does not imply which alternative would most likely occur or have the least environmental impacts. The following generation alternatives are considered in detail:

- coal-fired generation at the North Anna site and at an alternate greenfield site (Section 8.2.1)

- natural gas-fired generation at the North Anna site and at an alternate greenfield site (Section 8.2.2)

- nuclear generation at the North Anna site and an alternate greenfield site (Section 8.2.3).

The alternative of purchasing power from other sources to replace power generated at North Anna Power Station, Units 1 and 2 is discussed in Section 8.2.4. Other power generation alternatives and conservation alternatives considered by the staff and found not to be reasonable replacements for Units 1 and 2 are discussed in Section 8.2.5. Section 8.2.6 discusses the environmental impacts of a combination of generation and conservation alternatives.

Each year the Energy Information Administration (EIA), a component of the U.S. Department of Energy (DOE), issues an Annual Energy Outlook. In the *Annual Energy Outlook 2002*, issued in December 2001 (DOE/EIA 2001a), EIA projects that combined-cycle or combustion turbine technology fueled by natural gas is likely to account for approximately 88 percent of new electric generating capacity between the years 2001 and 2020. Both technologies are designed primarily to supply peak and intermediate capacity, but combined-cycle technology also can be used to meet baseload[(a)] requirements. Coal-fired plants are projected by EIA to account for approximately 9 percent of new capacity during this period. Coal-fired plants are generally used to meet baseload requirements. Renewable energy sources, primarily wind, geothermal, and municipal solid waste units, are projected by EIA to account for the remaining 3 percent of capacity additions. The EIA's projections are based on the assumption that providers of new generating capacity will seek to minimize cost while meeting applicable environmental requirements. Combined-cycle plants are projected by EIA to have the lowest generation cost in 2005 and 2020, followed by coal-fired plants and then wind generation (DOE/EIA 2001a).

EIA also projects that new nuclear power plants will not account for any new generation capacity in the United States during the 2000 to 2020 time period because natural gas and coal-fired plants are projected to be more economical (DOE/EIA 2001a). In spite of this projection, a new nuclear plant alternative for replacing power generated by North Anna Power Station, Units 1 and 2, is considered in Section 8.2.3. Since 1997, the NRC has certified three new standard designs for nuclear power plants under the procedures in 10 CFR Part 52, Subpart B. These designs are the U.S. Advanced Boiling Water Reactor (10 CFR Part 52, Appendix A), the System 80+ Design (10 CFR Part 52, Appendix B), and the AP600 Design (10 CFR Part 52, Appendix C). The submission to the NRC of these three applications for certification indicates continuing interest in the possibility of licensing new nuclear power plants.

(a) A baseload plant normally operates to supply all or part of the minimum continuous load of a system and consequently produces electricity at an essentially constant rate. Nuclear power plants are commonly used for baseload generation; i.e., these units generally run near full load.

The NRC has recently established a New Reactor Licensing Program to prepare for and manage future reactor and site licensing applications (NRC 2001b).

North Anna Power Station, Units 1 and 2, have a combined average net capacity of 1,790 megawatts electric (MW(e)). For the coal and natural gas alternatives, VEPCo's environmental report (ER) assumes three standard 508-MW(e) units[a] as potential replacements for Units 1 and 2 (VEPCo 2001). The staff used this assumption in their evaluation, although it results in some environmental impacts that are roughly 17 percent lower than if full replacement capacity were constructed. VEPCo's reasoning is that although custom-sized units can be built, use of standardized sizes is more economical. Moreover, using four 508-MW(e) units for the analysis would overestimate environmental impacts and tend to make the fossil fuel alternatives less attractive.

8.2.1 Coal-Fired Generation

The coal-fired alternative is analyzed at both the North Anna site and at an alternate site. As discussed in Section 8.2, the staff assumed construction of three 508-MW(e) units.

The VEPCo ER (VEPCo 2001) assumes that coal and lime or limestone for a coal-fired plant sited at North Anna would be delivered by a CSX rail line to an existing 11-km (7-mi) rail spur that leads to North Anna. The rail system at North Anna would require modifications to handle the increased traffic (VEPCo 2001). Lime[b] or limestone is used in the scrubbing process for control of sulfur dioxide (SO_2) emissions.

While construction at an alternate, greenfield site is not specifically discussed in VEPCo's ER, rail delivery would be the most likely option for delivering coal and lime/limestone to an alternate inland site for the coal-fired plant. Barge delivery of coal and lime/limestone is potentially feasible for a coastal site. A coal slurry pipeline is also a technically feasible delivery option; however, the associated cost and environmental impacts make a slurry pipeline an unlikely transportation alternative. Construction at an alternate site could necessitate the construction of a new transmission line to connect to existing lines and a rail spur to the plant site.

The coal-fired plant would consume approximately 4.4 million MT (4.9 million tons) per year of pulverized bituminous coal with an ash content by weight of approximately 10.7 percent

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(a) Each of the coal-fired units would have a rating of 538 gross MW and 508 net MW. Each of the gas-fired units would have a rating of 528 gross MW and 508 net MW. The difference between "gross" and "net" is the electricity consumed onsite.

(b) In a typical wet scrubber, lime (calcium hydroxide) or limestone (calcium carbonate) is injected as a slurry into the hot effluent combustion gases to remove entrained sulfur dioxide. The lime-based scrubbing solution reacts with sulfur dioxide to form calcium sulfite, which precipitates out and is removed in sludge form.

(VEPCo 2001). The ER assumes a heat rate[a] of 3 J fuel/J electricity (10,200 Btu/kWh) and a capacity factor[b] of 0.85 (VEPCo 2001). After combustion, 99.9 percent of the ash (approximately 474,000 MT/yr [522,000 tons/yr]) would be collected and disposed of at the plant site. In addition, approximately 221,000 MT/yr (244,000 tons/yr) of scrubber sludge would be disposed of at the plant site based on annual lime usage of approximately 76,000 MT (84,000 tons) (VEPCo 2001).

Unless otherwise indicated, the assumptions and numerical values used in Section 8.2.1 are from the VEPCo ER (VEPCo 2001). The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the coal-fired alternative for 40 years is considered (as a reasonable projection of the operating life of a coal-fired plant).

8.2.1.1 Once-Through Cooling System

For purposes of this SEIS, the staff assumed that a coal-fired plant located at North Anna would use the existing once-through system as a source of cooling. An alternate greenfield site could use either a closed-cycle or a once-through cooling system.

The overall impacts of the coal-fired generating system are discussed in the following sections and summarized in Table 8-2. The extent of impacts at an alternate site would depend on the location of the particular site selected.

- **Land Use**

  The North Anna site is approximately 422 ha (1043 ac). Construction of the power block and coal storage area would impact some land area and associated terrestrial habitat. However, in the ER VEPCo states it will make maximum use of existing facilities and infrastructure, limiting the amount of new construction that would be required (VEPCo 2001). Specifically, the staff assumed that the coal-fired replacement plant alternative would use the existing once-through cooling system, switchyard, offices, and transmission line right-of-way.

(a) Heat rate is a measure of generating station thermal efficiency. In English units, it is generally expressed in British thermal units (Btu) per net kilowatt-hour (kWh). It is computed by dividing the total Btu content of fuel burned for electric generation by the resulting net kWh generation.

(b) The capacity factor is the ratio of electricity generated, for the period of time considered, to the energy that could have been generated at continuous full-power operation during the same period.

Table 8-2. Summary of Environmental Impacts of Coal-Fired Generation at North Anna Power Station and an Alternate Greenfield Site Using Once-Through Cooling

	North Anna		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	SMALL to MODERATE	Extensive use of existing infrastructure. Uses 172 ha (425 ac) of undeveloped portion of North Anna for waste disposal of coal ash and scrubber sludge over 40-year plant life Additional offsite land impacts for coal and limestone mining.	SMALL to LARGE	Uses up to 1100 ha (2600 ac) for plant, offices, parking, and waste disposal, additional offsite land impacts for coal and limestone mining; possible impacts for transmission line and rail spur. Degree of impact dependent on whether alternate site is disturbed SMALL to MODERATE impact previously developed site, LARGE impact greenfield site.
Ecology	SMALL to MODERATE	Uses previously developed areas except for waste disposal of coal ash and scrubber sludge. Potential habitat loss and fragmentation and reduced productivity and biological diversity could result from disturbing lands not previously disturbed.	SMALL to LARGE	Impact depends on whether site is previously developed (SMALL to MODERATE) or greenfield (MODERATE to LARGE), location and ecology of the site, surface water body used for intake and discharge, transmission line route, potential habitat loss and fragmentation, reduced productivity, and biological diversity.
Water Use and Quality				
Surface Water	SMALL	Uses existing once-through cooling system.	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged and the characteristics of the surface water body at the alternate site.
Groundwater	SMALL	Groundwater use is <1000 gpm; once-through cooling is employed	SMALL	Groundwater use similar to impacts at North Anna site; impacts depend on groundwater use and availability.

Table 8-2. (contd)

	North Anna		Alternate Greenfield Site	
Impact Category	Impact	Comments	Impact	Comments
Air Quality	MODERATE	Sulfur oxides • 4130 MT/yr (4550 tons/yr) Nitrogen oxides • 1075 MT/yr (1185 tons/yr) Particulates • 237 MT/yr (261 tons/yr) of total suspended particulates, which would include 54 MT/yr (60 tons/yr) of PM_{10}. Carbon monoxide • 1100 MT/yr (1215 tons/yr) Small amounts of mercury and other hazardous air pollutants and naturally occurring radioactive materials – mainly uranium and thorium.	MODERATE	Potentially same impacts as at North Anna, although pollution-control standards may vary.
Waste	MODERATE	Total waste volume would be approximately 695,000 MT/yr (765,000 tons/yr) of ash and scrubber sludge requiring approximately 172 ha (425 ac) for disposal during the 40-year life of the plant.	MODERATE	Same impacts as at North Anna; waste disposal constraints may vary
Human Health	SMALL	Impacts are uncertain, but considered SMALL in the absence of more quantitative data.	SMALL	Same impact as at North Anna.

Table 8-2. (contd)

	North Anna		Alternate Greenfield Site	
Impact Category	Impact	Comments	Impact	Comments
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 2500 workers during the peak period of the 5-year construction period, followed by reduction of current North Anna, Units 1 and 2 work force from approximately 921 to 961 permanent and contractor employees to 200. Tax base preserved. Impacts during operation would be SMALL to MODERATE due to loss of employment in Louisa County, which may be offset by future economic growth in the County and surrounding Richmond metropolitan area	SMALL to LARGE	Construction impacts depend on location, but could be LARGE if plant is located in a rural area. Louisa County would experience loss of Units 1 and 2 tax base and employment with potentially LARGE impacts. Impacts during operation at alternate site would be SMALL to MODERATE, depending upon the economy at the alternate site
	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE. Transportation impacts during operation would be SMALL due to decreased work force.	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE, depending on the transportation infrastructure at the alternate site Transportation impacts during operation would be SMALL due to the decreased work force.
		For rail transportation of coal and lime/limestone, the impact is considered SMALL		For rail transportation of coal and lime/limestone, the impact is considered SMALL in a rural area and MODERATE in a more crowded, suburban area. For barge transportation, the impact is considered SMALL

Table 8-2. (contd)

Impact Category	North Anna Impact	North Anna Comments	Alternate Greenfield Site Impact	Alternate Greenfield Site Comments
Aesthetics	SMALL to MODERATE	Three coal-fired power plant units and exhaust stacks would be visible in daylight hours from offsite. The plant would also be visible at night because of outside lighting Rail transportation of coal and lime/limestone would also have a SMALL to MODERATE aesthetic impact. Coal-fired generation would introduce mechanical sources of noise audible offsite. These impacts are SMALL to MODERATE	SMALL to LARGE	Impact would depend on the site selected and the surrounding land features and could be LARGE if a greenfield site is selected. If needed, a new transmission line or rail spur would add to the aesthetic impact Rail transportation of coal and lime/limestone would be SMALL to MODERATE, again depending on the characteristics of the alternate site. Barge transportation of coal and lime/limestone would have a SMALL to MODERATE esthetic impact. Noise impact would be SMALL to MODERATE.
Historic and Archaeological Resources	SMALL	Some construction would affect previously undeveloped parts of North Anna; cultural resource inventory should minimize any impacts on undeveloped lands. Studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on undeveloped land on cultural resources, even at a developed site.	SMALL	Alternate location would necessitate cultural resource studies. Studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on undeveloped sites on cultural resources
Environmental Justice	SMALL to 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 from 721 to 761 operating jobs (permanent and contractor) at North Anna could reduce employment prospects for minority and low-income populations. Dependent, to some extent, on the economic vitality/expansion of the Richmond metropolitan and surrounding area.	SMALL to LARGE	Impacts at alternate site vary depending on population distribution and makeup. Could be SMALL to LARGE. Louisa County would lose significant revenue, which could have MODERATE to LARGE impacts on minority and low-income populations in terms of services the County could provide with the smaller property tax and employment base

The coal-fired generation alternative would necessitate converting some of the unused land at North Anna to coal storage and ash and scrubber sludge disposal. VEPCo estimates that ash and scrubber waste disposal over a 40-year plant life would require approximately 172 ha (425 ac) (VEPCo 2001).[a] Approximately 86 ha (213 ac) of second-growth mixed pine hardwoods would be converted to waste disposal facilities during the 20-year license renewal term. VEPCo believes that there is space within the existing North Anna footprint to accommodate waste disposal. After closure, the waste site would be re-vegetated and the land would become available for other uses. Additional land-use changes would occur offsite in an undetermined coal-mining area to supply coal for the plant. The GEIS estimates that approximately 8900 ha (22,000 ac) would be affected for mining the coal and disposing of the waste to support a 1000 MW(e) coal plant during its operational life (NRC 1996). A replacement coal-fired plant for North Anna Power Station, Units 1 and 2, would be 1524 MW(e) and would affect proportionately more land. Partially offsetting this offsite land use would be the elimination of the need for uranium mining to supply fuel for Units 1 and 2. The GEIS states that approximately 405 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000-MW(e) nuclear power plant (NRC 1996).

The impact of a coal-fired generating unit on land use at North Anna is best characterized as SMALL to MODERATE. The impact would definitely be greater than the OL renewal alternative.

In the GEIS, NRC staff estimated that a 1000-MW(e) coal-fired plant would require approximately 700 ha (1700 ac) (NRC 1996). Construction of a 1524 MW(e) coal-fired generation alternative at an alternate site could impact proportionately more land. The degree to which the land use would be impacted depends on whether the alternate site is a greenfield site or previously developed industrial site. Additional land could be needed for a transmission line and for a rail spur to the plant site. Depending on transmission line and rail line routing requirements, this alternative would result in SMALL to LARGE land-use impacts.

- **Ecology**

Locating a coal-fired plant at the North Anna site would have some impact on ecological and terrestrial resources because of the need to convert 86 ha (213 ac) of undisturbed land for ash and scrubber sludge disposal. In addition, construction of the power block and coal storage area would impact some land area and associated terrestrial habitat. Operation of the coal-fired plant would use the existing cooling system, which would minimize impacts to

(a) While only half of the 172 ha (425 ac) would be attributable to the 20-year license renewal alternative, the total numbers are pertinent as a cumulative impact (VEPCo 2001).

aquatic resources. In summary, because the coal-fired alternative is developed on a previously disturbed area, is at an existing industrial site, and makes maximum use of existing facilities, it is expected that the ecological impacts would be SMALL to MODERATE, but still greater than renewal of the North Anna Power Station, Units 1 and 2, OLs.

At an alternate site, the coal-fired generation alternative would introduce construction impacts and new incremental operational impacts. Even assuming siting at a previously disturbed area, the impacts could alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Use of cooling makeup water from a nearby surface water body could have adverse aquatic resource impacts. If needed, construction and maintenance of a transmission line and a rail spur would have ecological impacts. Overall, the ecological impacts at an alternate site would be SMALL to MODERATE (previously developed site) or MODERATE to LARGE (greenfield site).

- **Water Use and Quality**

Surface water. The coal-fired generation alternative at the North Anna site is assumed to use the existing once-through cooling system, which would minimize incremental water use and quality impacts. Operation using the existing cooling system should minimize any impacts on water quality. Thus, surface water impacts are expected to remain SMALL; the impacts would be sufficiently minor that they would not noticeably alter any important attribute of the resource.

For a coal-fired plant located at an alternate site, the impact on the surface water would depend on the volume of water needed for makeup water, the discharge volume, and the characteristics of the receiving body of water. Intake from and discharge to any surface body of water would be regulated by the Commonwealth of Virginia or another state. Some erosion and sedimentation would also likely occur during construction (NRC 1996). The impacts could range between SMALL to MODERATE.

Groundwater. The staff assumed that a coal-fired plant located at North Anna would obtain potable, process, and fire-protection water from the series of groundwater wells that currently supply Units 1 and 2 (see Section 2.2.2). Groundwater withdrawals would be less than no-action and license renewal alternatives because of the reduced work force. Hence, impacts are considered SMALL. Use of groundwater for a coal-fired plant sited at an alternate site is a possibility. Groundwater withdrawal at an alternate site would likely require a permit from the Virginia Department of Environmental Quality (VDEQ). The impacts are considered SMALL.

- **Air Quality**

The air-quality impacts of coal-fired generation vary considerably from those of nuclear generation due to emissions of sulfur oxides (SO_x), nitrogen oxides (NO_x), particulates, carbon monoxide, hazardous air pollutants such as mercury, and naturally occurring radioactive materials.

Louisa County is in the Northeastern Air Quality Control Region (40 CFR 81.145). Louisa County is in compliance with the national ambient air quality standards for particulate matter, carbon monoxide, nitrogen dioxide, lead, sulfur dioxide, and ozone (40 CFR 81.347).

A new coal-fired generating plant located at North Anna would likely need a prevention of significant deterioration permit and an operating permit under the Clean Air Act (CAA). The plant would need to comply with the new source performance standards for such plants set forth in 40 CFR Part 60, Subpart Da. The standards establish limits for particulate matter and opacity (40 CFR 60.42a), SO_2 (40 CFR 60.43a), and NO_x (40 CFR 60.44a).

Section 169A of the CAA (42 USC 7401) establishes a national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas when impairment results from man-made air pollution. If a coal-fired plant were located close to a mandatory Class I area, additional air pollution control requirement could be imposed. However, the mandatory Class I Federal areas closest to the North Anna site are the Swanquarter Wilderness Area in eastern North Carolina, located approximately 312 km (194 mi) southeast of North Anna; Shenandoah National Park, located approximately 177 km (110 mi) northwest of North Anna; and the James River Face Wilderness located approximately 166 km (103 mi) west of North Anna. The U.S. Environmental Protection Agency (EPA) has various regulatory requirements for visibility protection in 40 CFR Part 51, Subpart P, including a specific requirement for review of any new major stationary source in an area designated as attainment or unclassified under the CAA. Louisa County is classified as attainment or unclassified for criteria pollutants.[a] EPA issued a new regional haze rule in 1999 (64 FR 35713, July 1,1999 [EPA 1999]). The rule specifies that for each mandatory Class I Federal area located within a state, the state must establish goals that provide for reasonable progress towards achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most-impaired days over the period of the implementation plan and ensure no degradation in visibility for the least-impaired days over the same period [40 CFR 51.308(d)(1)].

(a) Existing criteria pollutants under the CAA are ozone, carbon monoxide, particulates, sulfur dioxide, lead, and nitrogen oxide. Ambient air standards for criteria pollutants are set out at 40 CFR Part 50.

In 1998, EPA issued a rule requiring 22 eastern states, including Virginia, to revise their state implementation plans to reduce nitrogen oxide emissions (63 FR 49442, EPA 1998). Nitrogen oxide emissions contribute to violations of the national ambient air quality standard for ozone. The total amount of nitrogen oxides that can be emitted by each of the 22 states in the year 2007 ozone season (May 1 - September 30) is set out at 40 CFR 51.121(e). For Virginia, the amount is 163,470 MT (180,195 tons). Any new coal-fired plant in Virginia would be subject to this limitation.

Impacts for particular pollutants are as follows:

Sulfur oxides emissions. VEPCo states in its ER that an alternative coal-fired plant located at North Anna would use wet scrubber-lime/limestone for flue gas desulfurization (VEPCo 2001).

A new coal-fired power plant would be subject to the requirements in Title IV of the Clean Air Act. Title IV was enacted to reduce emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x), the two principal precursors of acid rain, by restricting emissions of these pollutants from power plants. Title IV caps aggregate annual power plant SO_2 emissions and imposes controls on SO_2 emissions through a system of marketable allowances. EPA issues one allowance for each ton of SO_2 that a unit is allowed to emit. New units do not receive allowances but are required to have allowances to cover their SO_2 emissions. Owners of new units must therefore acquire allowances from owners of other power plants by purchase or reduce SO_2 emissions at other power plants they own. Allowances can be banked for use in future years. Thus, a new coal-fired power plant would not add to net regional SO_2 emissions, although it might do so locally.

VEPCo estimates that by using the best technology to minimize SO_x emissions, the total annual stack emissions would be approximately 4130 MT (4548 tons) of SO_x (VEPCo 2001). This level of SO_x emission would be greater than the OL renewal alternative.

Nitrogen oxides emissions. Section 407 of the CAA establishes technology-based emission limitations for NO_x emissions. The market-based allowance system used for SO_2 emissions is not used for NO_x emissions. A new coal-fired power plant would be subject to the new source performance standards for such plants in 40 CFR 60.44a(d)(1). This regulation, issued on September 16, 1998 (EPA 1998), limits the discharge of any gases that contain nitrogen oxides (expressed as NO_x) in excess of 200 ng/J of gross energy output (1.6 lb/MWh), based on a 30-day rolling average.

VEPCo estimates that by using low NO_x burners with overfire air and selective catalytic reduction the total annual NO_x emissions for a new coal-fired power plant would be

approximately 1075 MT (1185 tons) (VEPCo 2001). This level of NO_x emissions would be greater than the OL renewal alternative.

Particulate emissions. VEPCo estimates that the total annual stack emissions would include 237 MT (261 tons) of filterable total suspended particulates (particulates that range in size from less than 0.1 μm up to approximately 45 μm). The 237 MT would include 54 MT (60 tons) of PM_{10} (particulate matter having an aerodynamic diameter less than or equal to 10 μm). Fabric filters or electrostatic precipitators would be used for control. In addition, coal-handling equipment would introduce fugitive particulate emissions. Particulate emissions would be greater under the coal alternative than the OL renewal alternative.

During construction of a coal-fired plant, fugitive dust would be generated. In addition, exhaust emissions would come from vehicles and motorized equipment used during the construction process.

Carbon monoxide emissions. VEPCo estimates that the total carbon monoxide emissions would be approximately 1110 MT (1221 tons) per year. This level of emissions is greater than the OL renewal alternative.

Hazardous air pollutants including mercury. In December 2000, EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam generating units (65 FR 79825, EPA 2000b). EPA determined that coal- and oil-fired electric utility steam-generating units are significant emitters of hazardous air pollutants. Coal-fired power plants were found by EPA to emit arsenic, beryllium, cadmium, chromium, dioxins, hydrogen chloride, hydrogen fluoride, lead, manganese, and mercury (EPA 2000b). EPA concluded that mercury is the hazardous air pollutant of greatest concern. EPA found that (1) there is a link between coal consumption and mercury emissions, (2) electric utility steam-generating units are the largest domestic source of mercury emissions, and (3) certain segments of the U.S. population (e.g., the 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). 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 (EPA 2000b).

Uranium and thorium. Coal contains uranium and thorium. Uranium concentrations are generally in the range of 1 to 10 parts per million. Thorium concentrations are generally about 2.5 times greater than uranium concentrations (Gabbard 1993). One estimate is that a typical coal-fired plant released roughly 4.7 MT (5.2 tons) of uranium and 11.6 MT (12.8 tons) of thorium in 1982 (Gabbard 1993). The population dose equivalent from the

uranium and thorium releases and daughter products produced by the decay of these isotopes has been calculated to be significantly higher than that from nuclear power plants (Gabbard 1993).

Summary. The GEIS analysis does not quantify emissions from coal-fired power plants, but implies that air impacts would be substantial. The GEIS also mentions global warming from unregulated carbon dioxide emissions and acid rain from SO_x and NO_x emissions as potential impacts (NRC 1996). Adverse human health effects, such as cancer and emphysema, have been associated with the products of coal combustion. The appropriate characterization of air impacts from coal-fired generation would be MODERATE. The impacts would be clearly noticeable but would not destabilize air quality.

Siting a coal-fired generation plant at a site other than North Anna would not significantly change air-quality impacts, although it could result in installing more or less stringent pollution-control equipment to meet applicable local requirements. Therefore, the impacts would be MODERATE.

- **Waste**

Coal combustion generates waste in the form of ash, and equipment for controlling air pollution generates spent selective catalytic reduction catalyst, additional ash, and scrubber sludge. Three 508-MW(e) coal-fired plants would generate approximately 695,000 MT (766,060 tons) of this waste annually for 40 years. The waste would be disposed of onsite, accounting for approximately 172 ha (425 ac) of land area over the 40-year plant life. Waste impacts to groundwater and surface water could extend beyond the operating life of the plant if leachate and runoff from the waste storage area occurs. Disposal of the 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 could be available for other uses. Construction-related debris would also be generated during construction activities.

In May 2000, EPA issued a Notice of Regulatory Determination on Wastes From the Combustion of Fossil Fuels (65 FR 33213, EPA 2000a). EPA concluded that some form of national regulation is warranted to address coal combustion waste products because (1) the composition of these wastes could present danger to human health and the environment under certain conditions; (2) EPA has identified 11 documented cases of proven damages to human health and the environment by improper management of these wastes in landfills and surface impoundments; (3) present disposal practices are such that, in 1995, these wastes were being managed in 40 to 70 percent of landfills and surface impoundments without reasonable controls in place, particularly in the area of groundwater monitoring; and

(4) EPA identified gaps in state oversight of coal combustion wastes. Accordingly, EPA announced its intention to issue regulations for disposal of coal combustion waste under subtitle D of the Resource Conservation and Recovery Act (RCRA 1976, 42 USC 6901).

For these reasons, the appropriate characterization of impacts from waste generated from burning coal is MODERATE; the impacts would be clearly noticeable but would not destabilize any important resource.

Siting the facility at a site other than the North Anna would not alter waste generation, although other sites might have more constraints on disposal locations. Therefore, the impacts would be MODERATE.

- **Human Health**

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

The staff stated in the GEIS that there could be human health impacts (cancer and emphysema) from inhalation of toxins and particulates from coal-fired plants, but does not identify the significance of these impacts (NRC 1996). In addition, the discharges of uranium and thorium from coal-fired plants can potentially produce radiological doses in excess of those arising from nuclear power plant operations (Gabbard 1993).

Regulatory agencies, including EPA and State agencies, set air emission standards and requirements based on human health impacts. These agencies also impose site-specific emission limits as needed to protect human health. As discussed previously, EPA has recently concluded that certain segments of the U.S. population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures from sources such as coal-fired power plants. However, in the absence of more quantitative data, human health impacts from radiological doses and inhaling toxins and particulates generated by burning coal are characterized as SMALL.

- **Socioeconomics**

Construction and Operation. Construction of the coal-fired alternative would take approximately 5 years. The staff assumed that construction would take place while North Anna Power Station, Units 1 and 2, continue operation and would be completed by the time

Units 1 and 2 permanently cease operations. The construction work force would be expected to vary between 1200 and 2500 workers during the 5-year construction period (NRC 1996). These workers would be in addition to the approximately 851 permanent and 70 to 110 contract workers employed at Units 1 and 2. During construction of the new coal-fired plant, communities near North Anna would experience demands on housing and public services that could have SMALL to MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from outside the immediate area of the site, including the Richmond metropolitan area, Fredericksburg, and Charlottesville, among others. Nearby communities to North Anna would be impacted by the loss of the construction jobs once construction is completed.

If the coal-fired replacement plant were constructed at North Anna and Units 1 and 2 were decommissioned, there would be a loss of approximately 721 to 761 permanent and contract employees, as VEPCo estimates that the completed coal-fired plant would employ approximately 200 workers (VEPCo 2001). There would be a commensurate reduction in demand on socioeconomic resources and contribution to the regional economy. The coal-fired plants would provide a new tax base to offset the loss of tax base associated with decommissioning of the nuclear units. For all of these reasons, the appropriate characterization of non-transportation socioeconomic impacts for a coal-fired plant constructed at the North Anna site would be SMALL to MODERATE; the socioeconomic impacts would be noticeable, but would be unlikely to destabilize the area. The impacts could be mitigated by the site's proximity to the Richmond metropolitan area and may be additionally offset if economic growth in Richmond and surrounding areas continues as during the last decade.

Construction of a replacement coal-fired power plant at an alternate site would relocate some socioeconomic impacts but would not eliminate them. Louisa County would experience the brunt of North Anna Power Station, Units 1 and 2, operational job loss and would lose a significant tax base. These losses could have potentially LARGE socioeconomic impacts to the County, particularly over the short to intermediate term (from 5 to 10 years following plant closure). Communities around the new site would have to absorb the impacts of a large, temporary work force (up to 2500 workers at the peak of construction) and a permanent work force of approximately 200 workers. The staff stated in the GEIS that socioeconomic impacts at a rural site would be larger than at an urban site because more of the peak construction work force would need to move to the area to work. Alternate sites would need to be analyzed on a case-by-case basis. Socioeconomic impacts at or near an urban, previously developed industrial area would be SMALL. Socioeconomic impacts at a rural site could be MODERATE to LARGE, depending on the relative location of the site to towns and cities that might be able to accommodate such impacts.

Transportation. During the 5-year construction period of replacement coal-fired units, up to 2500 construction workers would be working at the site in addition to the 921 to 961 permanent and contract workers employed at Units 1 and 2. The addition of these workers could place significant traffic loads on existing highways near North Anna. Such impacts would be MODERATE to LARGE.

For transportation related to the commuting of plant operating personnel, the impacts are considered SMALL. The maximum number of plant operating personnel would be approximately 200 compared to the current commuting work force of approximately 921 to 961 permanent and contract workers. Therefore, traffic impacts associated with plant personnel commuting to a coal-fired plant would be expected to be SMALL compared to the current impacts from Unit 1 and 2 operations.

At North Anna, coal and lime/limestone likely would be delivered by rail. Each train would have approximately 115 rail cars. Each open-top rail car holds about 90 MT (100 tons) of coal. Additional rail cars would be needed for lime/limestone delivery. In all, approximately 425 trains per year would deliver the coal and lime/limestone for the three units. An average of roughly 16 train trips per week would be needed to transport the coal and lime/limestone. For each full train delivery, an empty train would return. On several days per week, there could be two to three trains per day using the rail spur to North Anna, resulting in blocking at grade crossings. North Anna is located in a semi-rural area, and the roads are lightly traveled during most parts of the day except at shift changes at the site. Therefore, the effect of the increased rail traffic on residents and vehicular traffic in the North Anna area is considered SMALL.

Transportation-related impacts associated with commuting construction workers at an alternate rural site are also site-dependent and could be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would also be site-dependent but can be characterized as SMALL.

At an alternate site, coal and limestone delivery likely would be delivered by rail, although barge delivery would be feasible at a coastal location. Impacts of rail transportation would be SMALL in a rural area and MODERATE in a more crowded, suburban area. Barge delivery of coal and lime/limestone would likely have SMALL socioeconomic impacts.

- **Aesthetics**

The three coal-fired power plant units could be as high as 60 m (200 ft) and be visible in daylight hours from offsite. The three exhaust stacks would be as high as 185 m (600 ft) (VEPCo 2001). The stacks would be visible in daylight hours. The plant units and

associated stacks also would be visible at night because of outside lighting. Visual impacts of a new coal-fired plant could be mitigated by landscaping and selecting building color consistent with the environment. Visual impact at night could be mitigated by reducing lighting and using shielding appropriately.

Coal-fired generation would introduce 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 associated with normal plant operations. Intermittent sources include the equipment related to coal handling, solid-waste disposal, transportation related to coal and lime/limestone delivery, use of outside loudspeakers, and the commuting of plant employees. The incremental noise impacts of a coal-fired plant compared to existing North Anna Power Station, Units 1 and 2, operations are considered to be SMALL to MODERATE.

At an alternate site, there would be an aesthetic impact from the buildings and exhaust stacks. This impact could be LARGE if a greenfield site is used. There would also be an aesthetic impact if construction of a new transmission line and/or rail spur is needed. Noise impacts associated with rail delivery of coal and lime/limestone would be most significant for residents living in the vicinity of the facility and along the rail route. Although noise from passing trains significantly raises noise levels near the rail corridor, the short duration of the noise reduces the impact. In a more suburban location, the impacts are considered MODERATE. This is due to the frequency of train transport, the fact that many people are likely to be within hearing distance of the rail route, and the impacts of noise on residents in the vicinity of the facility and the rail line. At a more rural location, the impacts could be SMALL. Noise and light from the plant would be detectable offsite. Aesthetic impacts at the plant site would be mitigated if the plant were located in an industrial area adjacent to other power plants or industrial facilities, in which case the impacts could be SMALL. Overall, the aesthetic impacts associated with locating at an alternate site can be categorized as SMALL to LARGE, depending on the characteristics of the alternate site.

- **Historic and Archaeological Resources**

At the North Anna site or an alternate site, a cultural resource inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction at North Anna or an alternate site, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction

on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission line rights-of-way, rail lines, or other rights-of-way). Historic and archaeological resource impacts can generally be effectively managed and as such are considered SMALL.

- **Environmental Justice**

No environmental pathways or locations 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 North Anna. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect the minority and low-income populations to the extent housing frequented by these populations could come into increased demand. Closure of North Anna, Units 1 and 2, would result in a decrease in employment of approximately 721 to 761 permanent and contract employees at the site. Resulting economic conditions could reduce employment prospects for minority or low-income populations. Overall, impacts are expected to be SMALL to MODERATE and may be mitigated by the economic vitality/expansion of the Richmond metropolitan and surrounding area.

Impacts at other sites would depend on the site chosen and the nearby population distribution. If a replacement coal-fired plant were constructed at an alternate site, Louisa County would experience a significant loss of property tax revenue that would affect the County's ability (at least in the short- to mid-term following plant closure) to provide services and programs. Impacts to minority and low-income populations in Louisa County could be SMALL to LARGE. Impacts at the alternate site would vary between MODERATE to LARGE, depending on the population makeup and distribution and the economy.

8.2.1.2 Closed-Cycle Cooling System

This section discusses the environmental impacts of constructing a coal-fired generation system at an alternate site using closed-cycle cooling with cooling towers. The impacts (SMALL, MODERATE, or LARGE) of this option are essentially the same as the impacts for a coal-fired plant using the once-through system. However, there are some environmental impact differences between the closed-cycle and once-through cooling systems. Table 8-3 summarizes the incremental differences.

Table 8-3. Summary of Environmental Impacts of Coal-Fired Generation at an Alternate Greenfield Site with Closed-Cycle Cooling System Utilizing Cooling Towers

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 - 12 additional ha (25 - 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impact would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Introduction of cooling towers and associated plume. Natural draft towers could be up to 158 m (520 ft) high. Mechanical draft towers could be up to 30 m (100 ft) high and also have an associated noise impact.
Historic and Archaeological Resources	No change.
Environmental Justice	No change

8.2.2 Natural Gas-Fired Generation

The environmental impacts of the natural gas-fired alternative are examined in this section for both the North Anna site and an alternate site. For the North Anna site, the staff assumed that the plant would use the existing once-through cooling system.

North Anna is not served by natural gas pipelines. A dedicated, high-pressure 6-m (2-ft) pipeline would have to be constructed to North Anna from Gordonsville, Virginia, a distance of approximately 65 km (40 mi). The pipeline right-of-way would require 295 ha (729 ac).[(a)] VEPCo also notes in its ER that in the winter, when demand for natural gas is high, it may become necessary for a replacement natural gas-fired plant to operate on fuel oil due to lack of gas supply. Operation with oil would result in more stack emissions (VEPCo 2001).

If a new natural gas-fired plant were built elsewhere to replace North Anna Power Station, Units 1 and 2, a new transmission line would need to be constructed to connect to existing lines. In addition, construction or upgrade of a natural gas pipeline from the plant to a supply point where a firm supply of gas would be available could be needed. One potential source of natural gas is liquefied natural gas (LNG) imported to either the Cove Point facility in Maryland or the Elba Island facility in Georgia. Both facilities are expected to be reactivated in 2002 (DOE/EIA 2001a). LNG imported to either facility would need to be vaporized and transported to the plant via pipeline.

The staff assumed that a replacement natural gas-fired plant would use combined-cycle combustion turbines (VEPCo 2001). In a 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 boiler to make steam to generate additional electricity.

The following additional assumptions are made for the natural gas-fired plants (VEPCo 2001):

- three 508-MW(e) units will be needed, each consisting of two 168-MW combustion turbines and a 172-MW heat recovery boiler
- natural gas with an average heating value of 39 MJ/m^3 (1059 Btu/ft^3) will be the primary fuel
- low-sulfur number 2 fuel oil will be used as backup fuel
- heat rate will be 2 J fuel/J electricity (6,700 Btu/kWh)
- capacity factor will be 0.85
- gas consumption will be 2.11 billion m^3/yr (74.7 billion ft^3/yr).

Unless otherwise indicated, the assumptions and numerical values used in Section 8.2.2 are from the VEPCo ER. The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the natural gas-fired alternative for 40 years is considered because this is a reasonable projection of the operating life of the plant.

(a) Calculated as follows: 40 mi X 150 ft easement = 295 ha or 727 ac.

8.2.2.1 Once-Through Cooling System

The overall impacts of the natural gas-generating system are discussed in the following sections and summarized in Table 8-4. The extent of impacts at an alternate site will depend on the location of the particular site selected.

- **Land Use**

  For siting at North Anna, existing facilities and infrastructure would be used to the extent practicable, limiting the amount of new construction that would be required. Specifically, the staff assumed that the natural gas-fired replacement plant alternative would use the existing once-through cooling system, switchyard, offices, and transmission line rights-of-way. In the GEIS staff estimated that 45 ha (110 ac) are needed for a plant site (NRC 1996). At North Anna, this much previously disturbed land is available within the boundaries of the plant site (VEPCo 2001). Additional land for backup oil storage facilities is required. There would be an additional impact of up to approximately 295 ha (729 ac) for construction of a natural gas pipeline to the North Anna site (VEPCo 2001). VEPCo states it would apply best management practices during construction of the pipeline such as minimizing soil loss, restoring vegetation immediately after the excavation is backfilled, and constructing the pipeline adjacent to existing, previously disturbed easements, if possible (VEPCo 2001). Land-use impacts of siting at North Anna would be SMALL to MODERATE and depend on the extent to which ecological damage could be minimized in the construction of the natural gas pipeline.

  For construction at an alternate site, the staff assumed that 45 ha (110 ac) would be needed for the plant and associated infrastructure (NRC 1996). A previously developed site with substantial infrastructure in place (e.g., gas line and transmission line), would be characterized as having SMALL impacts. For any new natural gas plant, additional land could be impacted for construction of a transmission line and/or natural gas pipeline to serve the plant and for backup oil facilities, in which case the impacts could be MODERATE. Land-use impacts at a greenfield site could be considered LARGE.

  Offsite of the North Anna or alternate site, additional land would be required for natural gas wells and collection stations. NRC staff estimated in the GEIS that approximately 1500 ha (3600 ac) would be needed for a 1000 MW(e) plant. A replacement gas-fired plant for North Anna Power Station, Units 1 and 2, would be 1524 MW(e) and would affect proportionately more land. Partially offsetting these offsite land requirements would be the elimination of the need for uranium mining to supply fuel for Units 1 and 2. The staff estimated in the GEIS (NRC 1996) that approximately 400 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000 MW(e) nuclear power plant. Because the assumed replacement units for North Anna would generate

Table 8-4. Summary of Environmental Impacts of Natural Gas-Fired Generation at North Anna Power Station and an Alternate Greenfield Site Using Once-Through Cooling

	North Anna Power Station Site		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	SMALL to MODERATE	45 ha (110 ac) of previously disturbed land needed for plant site. Additional impact of up to approximately 295 ha (729 ac) for construction of an underground gas pipeline. Maximum use of existing infrastructure at the site	SMALL to LARGE	SMALL if infrastructure in place, 45 ha (110 ac) for power- block, offices, roads, and parking areas MODERATE if additional land needed for transmission line and/or natural gas pipeline. LARGE if greenfield site and transmission lines required.
Ecology	SMALL to MODERATE	Uses undeveloped areas at North Anna plus land for a new gas pipeline.	SMALL to LARGE	Impact depends on whether a greenfield or previously developed site. Also, impacts depend on ecology of the site, surface water body used for intake and discharge, possible transmission and pipeline routes, potential habitat loss and fragmentation, reduced productivity, and biological diversity.
Water Use and Quality				
Surface Water	SMALL	Uses existing once-through cooling system.	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge and characteristics of surface water body
Groundwater	SMALL	Reduced groundwater withdrawals due to reduced work force.	SMALL	Groundwater impacts would depend on use and availability.
Air Quality	SMALL to MODERATE	Sulfur oxides • 122 MT/yr (134 tons/yr) Nitrogen oxides • 459 MT/yr (506 tons/yr) Carbon monoxide • 602 MT/yr (664 tons/yr) PM_{10} particulates • 180 MT/yr (198 tons/yr) Some hazardous air pollutants.	SMALL to MODERATE	Same emissions as at North Anna site.
Waste	SMALL	Small amount of ash produced.	SMALL	Small amount of ash produced.
Human Health	SMALL	Impacts considered to be minor	SMALL	Impacts considered to be minor.

Table 8-4. (contd)

	North Anna Power Station Site		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 1200 additional workers during the peak of the 3-year construction period, followed by reduction from current North Anna, Units 1 and 2 work force from 921 to 961 (permanent and contract) to 150; tax base preserved. Impacts during operation would be SMALL to MODERATE, due to loss of employment in Louisa County which may be offset by proximity to Richmond economy.	SMALL to LARGE	Impacts depend on site characteristics. During construction, impacts would be SMALL to MODERATE. Tax impacts on receiving county could be SMALL to LARGE. Up to 1200 additional workers during the peak of the 3-year construction period. Louisa County would experience loss of North Anna, Units 1 and 2 tax base and employment with potentially MODERATE to LARGE associated impacts
	SMALL to MODERATE	Transportation impacts associated with construction workers would be SMALL to MODERATE. Transportation impacts during operation would be SMALL due to smaller work force	SMALL to LARGE	Transportation impacts associated with construction workers would be SMALL to LARGE and would depend on population density and road infrastructure at alternate site Impacts during operation would be SMALL due to smaller work force.
Aesthetics	SMALL	Some visibility of structures offsite.	SMALL to LARGE	SMALL if previously developed site and site disturbance minimal. SMALL to MODERATE impact from plant and stacks and whether site is previously developed. Impacts increased to strongly MODERATE with construction of a transmission line to previously developed site. LARGE if greenfield site developed.
Historic and Archaeological Resources	SMALL	Any potential impacts likely can be managed effectively.	SMALL	Same as at North Anna Power Station site, any potential impacts likely can be managed effectively.

Table 8-4. (contd)

	North Anna Power Station Site		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Environmental Justice	SMALL to 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 771 to 811 permanent and contract operating jobs at North Anna could reduce employment prospects for minority and low-income populations. Proximity to Richmond economic area may mitigate impacts	SMALL to LARGE	Impacts at alternate site vary depending on population distribution and makeup at site could be SMALL to LARGE. Louisa County would lose significant revenue, which could have MODERATE to LARGE impacts on minority and low-income populations Proximity to Richmond economic area may mitigate Louisa impacts

1524 MW(e), the land needed for gas wells and collection stations (and the land not needed for nuclear fuel) would be proportionately higher.

- **Ecology**

At North Anna, there would be ecological land-related impacts for siting of the gas-fired plant. There would also be moderate ecological impacts associated with bringing a new underground gas pipeline to North Anna. There would be losses to less mobile animals such as toads and turtles. Because these animals are fairly common throughout the area, VEPCo expects negligible reduction in their population resulting from construction of the pipeline and does not expect that pipeline construction would create any long-term reduction in the local or regional diversity of plants and animals (VEPCo 2001). Overall, the ecological impacts are considered SMALL to MODERATE.

Ecological impacts at an alternate site would depend on the nature of the land converted for the plant and the possible need for a new transmission line and/or gas pipeline. At a greenfield site, construction of a transmission line and a gas pipeline to serve the plant could be expected to have ecological impacts. Whether these impacts are temporary or permanent and the extent to which ecological resources are impacted is highly dependent on the location of the alternative site. Ecological impacts resulting from plant siting and utility easements could impact threatened or endangered species. There could be wildlife habitat loss and reduced productivity, habitat fragmentation, and a local reduction in biological diversity. The cooling water intake and discharge could have aquatic resource impacts. Hence, at a greenfield site the ecological impacts are expected to be MODERATE to LARGE. If the alternative site selected already has been developed, then the ecological impacts would be SMALL if the required infrastructure is already in place. Overall, the

ecological impacts at an alternate site are considered SMALL to LARGE, depending on the characteristics of the site selected.

- **Water Use and Quality**

  Surface water. Overall, water-use and quality impacts at the North Anna site are considered SMALL as operation impacts are minimized by use of the existing intake/discharge system. Water-quality impacts from sedimentation during construction of a natural gas-fired plant is characterized by the staff in the GEIS as SMALL (NRC 1996). The staff also note that operational water quality impacts would be similar to, or less than, those from other generating technologies.

  For alternate sites, the impact on the surface water would depend on the volume of water needed for makeup water, the discharge volume, and the characteristics of the receiving body of water. Intake from and discharge to any surface body of water would be regulated by the Commonwealth of Virginia or another state. Water use and quality impacts at an alternate site are considered SMALL to MODERATE, depending on the characteristics of the alternate site.

  Groundwater. The staff assumed that a natural gas-fired plant located at North Anna would obtain potable, process, and fire-protection water from the series of groundwater wells that currently supply Units 1 and 2 (see Section 2.2.2). Groundwater withdrawals would be less than the no-action and license renewal alternatives because of the reduced work force. Hence, impacts are considered SMALL.

  It is possible that a gas-fired plant sited at an alternate site could use groundwater. Groundwater withdrawal at an alternate site would likely require a permit. For alternate greenfield sites, the impact to groundwater would depend on the site characteristics, including the amount of groundwater available. Overall, the impacts are considered SMALL.

- **Air Quality**

  Natural gas is a relatively clean-burning fuel. The gas-fired alternative would release similar types of emissions but in lesser quantities than the coal-fired alternative. Hence, it would be subject to the same air quality regulations as a coal-fired plant.

VEPCo projects the following emissions for the natural gas-fired alternative (VEPCo 2001):

Sulfur oxides - 122 MT/yr (134 tons/yr)
Nitrogen oxides - 459 MT/yr (506 tons/yr)
Carbon monoxide - 602 MT/yr (664 tons/yr)
PM_{10} particulates - 180MT/yr (198 tons/yr).

A natural gas-fired plant would also have unregulated carbon dioxide emissions that could contribute to global warming.

As previously discussed, in December 2000, EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000b). Natural gas-fired power plants were found by EPA to emit arsenic, formaldehyde, and nickel (EPA 2000b). Unlike coal and oil-fired plants, EPA did not determine that emissions of hazardous air pollutants from natural gas-fired power plants should be regulated under Section 112 of the CAA.

In addition, construction activities would result in temporary fugitive dust. Exhaust emissions would also come from vehicles and motorized equipment used during the construction process. These would be similar to the coal-fired alternative, but smaller due to the smaller construction work force.

Air emissions from the burning of natural gas would likely be the same at North Anna or at an alternate site. Impacts from the emissions would be clearly noticeable, but would not be sufficient to destabilize air resources as a whole. The overall air quality impact for a new natural gas-generating plant sited at North Anna or at an alternate site is considered SMALL to MODERATE, depending on the state of air quality at the alternate, greenfield site and the amount of number 2 fuel oil that may be needed to substitute for natural gas in winter months should a natural gas shortage develop–a situation applicable to both sites.

- **Waste**

There will be small amounts of solid-waste products (i.e., ash) from burning natural gas. In the GEIS the staff concluded that waste generation from gas-fired technology would be minimal (NRC 1996). Gas firing results in very few combustion by-products because of the clean nature of the fuel. Waste generation at a gas-fired plant would be largely limited to typical office wastes. Waste generation impacts would be so minor that they would not noticeably alter any important resource attribute. Construction-related debris would be generated during construction activities. Overall, the waste impacts would be SMALL for a natural gas-fired plant sited at North Anna or at an alternate site.

In the winter, it may become necessary for a replacement baseload natural gas-fired plant to operate on fuel oil due to shortages of natural gas. Oil combustion generates waste in the form of ash, and equipment for controlling air pollution generates additional ash and scrubber sludge. The amount of ash and sludge generated would depend on the quantity of fuel oil combusted. Overall, the waste impacts associated with fuel oil combustion at a combined cycle plant are expected to be SMALL because the amount of oil combusted is expected to be relatively small. When natural gas is available, fuel oil is generally not price-competitive with gas.

- **Human Health**

In the GEIS the staff identified cancer and emphysema as potential health risks from gas-fired plants (NRC 1996). The risk may be attributable to NO_x emissions that contribute to ozone formation, which in turn contribute to health risks. NO_x emissions from the plant would be regulated. Human health effects would not be detectable or would be sufficiently minor that they would neither destabilize nor noticeably alter any important attribute of the resource. Overall, the impacts on human health of the natural gas-fired alternative sited at North Anna or at an alternate site are considered SMALL.

- **Socioeconomics**

Construction and Operation. Construction of a natural gas-fired plant would take approximately 3 years. Peak employment could be up to 1200 workers (NRC 1996). The staff assumed that construction would take place while Units 1 and 2 continue operation and would be completed by the time they permanently cease operations. During construction, the communities surrounding North Anna would experience demands on housing and public services that could have SMALL to MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from cities such as Richmond, Fredericksburg, and Charlottesville, among others. After construction, the communities would be impacted by the loss of jobs. The current North Anna Power Station, Units 1 and 2, work force (approximately 921 to 961 permanent and contract workers) would decline through a decommissioning period to a minimal maintenance size. Approximately 150 workers would be needed to operate the natural gas-fired plant. The new natural gas-fired plant would replace the nuclear tax base in Louisa County. The impacts could be SMALL to MODERATE and may be moderated by Louisa County's proximity to Richmond.

Siting at an alternate site would result in the loss of the nuclear tax base and associated employment in Louisa County with potentially MODERATE to LARGE socioeconomic impacts. Socioeconomic impacts from locating the facilities at an alternate site would depend on the characteristics of the site. Impacts of construction could range between SMALL to MODERATE. Impacts during plant operation would be SMALL (smaller work

force), and the tax impacts could be SMALL to LARGE, depending on the relative proportion of taxes paid by the plant to total county taxes. In the GEIS (NRC 1996), the staff concluded that socioeconomic impacts from constructing a natural gas-fired plant would not be very noticeable and that the small operational work force would have the lowest socio-economic impacts of any nonrenewable technology. Compared to the coal-fired and nuclear alternatives, socioeconomic impacts would be mitigated by the smaller construction work force and the shorter construction time frame, and the smaller operations work force.

Overall, socioeconomic impacts resulting from construction of a natural gas-fired plant at North Anna would be SMALL to MODERATE and may be offset by the continued growth of the economy in Richmond and the surrounding area. For construction at an alternate site, socioeconomic impacts would be SMALL to LARGE, depending on the site characteristics at the alternate site.

Transportation. Transportation impacts associated with construction and operating personnel commuting to North Anna would be SMALL to MODERATE. The impacts can be classified as SMALL to LARGE for siting at an alternate site and would depend on the characteristics of the alternate site, including transportation infrastructure.

- **Aesthetics**

The turbine buildings and stacks (approximately 60 m [200 ft] high) would be visible during daylight hours from offsite, creating incremental visual impacts to those from existing North Anna facilities. The gas pipeline compressors would also be visible. Noise and light from the plant would be detectable offsite. At North Anna, these impacts would result in a SMALL aesthetic impact.

At an alternate site, the buildings and stacks could be visible offsite. Aesthetic impacts could be mitigated if the plant were located in an industrial area adjacent to other power plants or industrial facilities. Overall, the aesthetic impacts associated with a replacement natural gas-fired plant at an alternate site are categorized as SMALL. The impacts would be greater if a new transmission line is needed and could be considered MODERATE. The impacts could be LARGE if a greenfield site is developed.

- **Historic and Archaeological Resources**

At both North Anna and an alternate site, a cultural resource inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archaeological resources, and

possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction at North Anna or at an alternate site, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated rights-of-way where new construction would occur (e.g., roads, transmission and pipeline rights-of-way, or other rights-of-way). Hence, impacts to cultural resources can be effectively managed under current laws and regulations and kept SMALL at either the existing North Anna site or at an alternate site.

- **Environmental Justice**

No environmental pathways or locations have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement natural gas-fired plant were built at North Anna. Some impacts on housing availability and prices during construction might occur in Louisa County, which could disproportionately affect minority and low-income populations. Closure of North Anna, Units 1 and 2, would result in a decrease in employment of approximately 771 to 811 permanent and contract operating employees. Resulting economic conditions could reduce employment prospects for minority or low-income populations in Louisa County. The impacts could be offset by projected economic growth and the ability of affected workers to commute to other jobs in the County or nearby Richmond. Overall, impacts are expected to be SMALL to MODERATE.

Impacts at an alternate site would depend on the site chosen and the nearby population distribution. Minority and low-income populations at the alternate site could benefit from the plant's relocation through improved job prospects and the increased tax base that could enable more services to be provided. These impacts could be SMALL to LARGE. However, if a replacement natural gas-fired plant were constructed at an alternate site, Louisa County would experience a significant loss of property tax revenue, as well as jobs, which would affect the County's ability to provide services and programs. Impacts to minority and low-income populations in Louisa County could be MODERATE to LARGE, again potentially offset by other economic growth in the area not related to North Anna.

8.2.2.2 Closed-Cycle Cooling System

This section discusses the environmental impacts of constructing a natural gas-fired generation system at an alternate location using a closed-cycle cooling system with cooling towers. The impacts (SMALL, MODERATE, or LARGE) of this option are essentially the same as the

impacts for a natural gas-fired plant using once-through cooling. However, there are minor environmental differences between the closed-cycle and once-through cooling systems. Table 8-5 summarizes the incremental differences.

Table 8-5. Summary of Environmental Impacts of Natural Gas-Fired Generation at an Alternate Greenfield Site with Closed-Cycle Cooling Utilizing Cooling Towers

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 - 12 additional ha (25 - 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impact would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation.
Groundwater Use and Quality	No change.
Air Quality	No change.
Waste	No change.
Human Health	No change.
Socioeconomics	No change.
Aesthetics	Introduction of cooling towers and associated plume. Possible noise impact from operation of cooling towers.
Historic and Archaeological Resources	No change.
Environmental Justice	No change.

8.2.3 Nuclear Power Generation

Since 1997, the NRC has certified three new standard designs for nuclear power plants under 10 CFR Part 52, Subpart B. These designs are the U.S. Advanced Boiling Water Reactor (10 CFR Part 52, Appendix A), the System 80+ Design (10 CFR Part 52, Appendix B), and the AP600 Design (10 CFR Part 52, Appendix C). All of these plants are light water reactors. Although no applications for a construction permit or a combined license based on these certified designs have been submitted to NRC, the submission of the design certification applications indicates continuing interest in the possibility of licensing new nuclear power plants.

In addition, recent escalation in prices of natural gas and electricity have made new nuclear power plant construction potentially more attractive from a cost standpoint. Consequently, construction of a new nuclear power plant at North Anna using the existing once-through cooling system and at an alternate site using both closed- and open-cycle cooling are considered in this section. The staff assumed that the new nuclear plant would have a 40-year lifetime.

The NRC has summarized environmental data associated with the uranium fuel cycle in Table S-3 of 10 CFR 51.51. The impacts shown in Table S-3 are representative of the impacts that would be associated with a replacement nuclear power plant built to one of the certified designs sited at North Anna or an alternate site. The impacts shown in Table S-3 are for a 1000-MW(e) reactor and would need to be adjusted to reflect replacement of Units 1 and 2, which have a net total capacity of 1790 MW(e) (VEPCo 2001). The environmental impacts associated with transporting fuel and waste to and from a light water cooled nuclear power reactor are summarized in Table S-4 of 10 CFR 51.52. The summary of NRC's findings on NEPA issues for license renewal of nuclear power plants in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B is also relevant, although not directly applicable, for consideration of environmental impacts associated with the operation of a replacement nuclear power plant. Additional environmental impact information for a replacement nuclear power plant using once-through cooling is presented in Section 8.2.3.1, and environmental impact information for using closed-cycle cooling is presented in Section 8.2.3.2.

8.2.3.1 Once-Through Cooling System

The overall impacts of the nuclear generating system are discussed in the following sections. The impacts are summarized in Table 8-6. The extent of impacts at an alternate site will depend on the location of the particular site selected.

- **Land Use**

  The existing facilities and infrastructure at North Anna would be used to the extent practicable, limiting the amount of new construction that would be required. Specifically, the staff assumed that a replacement nuclear power plant would use the existing cooling system, switchyard, offices, and transmission line rights-of-way. Approximately 200 ha (500 ac) would be needed for the construction of the new plant, which might be accommodated within the existing North Anna plant site. Undisturbed industrial land on the site is in second-growth mixed pine hardwoods (VEPCo 2001), which may need to be disturbed to accommodate two new nuclear units. North Anna Power Station, Units 1 and 2, would continue to operate as the new nuclear power facilities are being constructed.

Table 8-6. Summary of Environmental Impacts of New Nuclear Power Generation at North Anna Power Station and an Alternate Greenfield Site Using Once-Through Cooling

	North Anna Power Station Site		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	MODERATE	Requires approximately 200 ha (500 ac) for the plant.	MODERATE to LARGE	Requires approximately 200 to 400 ha (500 to 1000 ac) for the plant. Possible additional land if a new transmission line is needed.
Ecology	MODERATE	Uses undeveloped areas at current North Anna site plus additional offsite land Potential habitat loss and fragmentation, and reduced productivity and biological diversity on offsite land.	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission line route; potential habitat loss and fragmentation, reduced productivity, and biological diversity.
Water Use and Quality				
Surface water	SMALL	Uses existing once-through cooling system.	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged and the characteristics of the surface water body
Groundwater	SMALL		SMALL	Impacts will depend on site characteristics and availability of groundwater.
Air Quality	SMALL	Fugitive emissions and emissions from vehicles and equipment during construction Small amount of emissions from diesel generators and possibly other sources during operation.	SMALL	Same impacts as at North Anna site.
Waste	SMALL	Waste impacts for an operating nuclear power plant are set out in 10 CFR 51, Appendix B, Table B-1 Debris would be generated and removed during construction	SMALL	Same impacts as at North Anna site
Human Health	SMALL	Human health impacts for an operating nuclear power plant are set out in 10 CFR 51, Appendix B, Table B-1	SMALL	Same impacts as at North Anna site

Table 8-6. (contd)

	North Anna Power Station Site		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 2500 workers during peak period of the 6-year construction period Operating work force assumed to be similar to Units 1 and 2. Louisa County tax base preserved. Impacts during operation would be SMALL.	SMALL to LARGE	Construction impacts depend on location. Impacts at a rural location could be LARGE. Louisa County would experience loss of tax base and employment, potentially offset by projected economic growth of Richmond metropolitan area. Operation impacts at an alternate site would SMALL to MODERATE.
	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE. Operation impacts would be SMALL.	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE. Transportation impacts of operating the plant would be SMALL to MODERATE.
Aesthetics	SMALL	No exhaust stacks or cooling towers would be needed Daytime visual impact could be mitigated by landscaping and appropriate color selection for buildings Visual impact at night could be mitigated by reduced use of lighting and appropriate shielding Noise impacts would be relatively SMALL and could be mitigated.	SMALL to LARGE	Impacts would depend on the characteristics of the alternate site. Impacts would be SMALL if the plant were located adjacent to an industrial area New transmission lines would add to the impact and would be SMALL to MODERATE depending on the alternate site's characteristics. If a greenfield site is selected, then the impacts could be LARGE.
Historic and Archaeological Resources	SMALL	Any potential impacts likely can be managed effectively	SMALL	Any potential impacts likely can be managed effectively .
Environmental Justice	SMALL	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.	SMALL to LARGE	Impacts will vary depending on population distribution and makeup at the site Impacts to minority and low-income residents of Louisa County associated with closure of North Anna, Units 1 and 2 could be significant – MODERATE to LARGE. Impacts to receiving County is site-specific and could range from SMALL to LARGE.

The impact of a replacement nuclear generating plant on land use at the North Anna site is best characterized as MODERATE. The impact would be greater than the OL renewal alternative.

Land-use impacts at an alternate site would be greater than at North Anna, including the possible need for a new transmission line. In addition, it may be necessary to construct a rail spur to an alternate site to bring in equipment during construction. Depending particularly on transmission line routing and whether an existing industrial site is used as the alternate site, siting a new nuclear plant at an alternate site could result in MODERATE to LARGE land-use impacts.

- **Ecology**

Locating a replacement nuclear power plant at the North Anna site would alter ecological resources because of the need to convert land to an industrial use. Some of this land, however, would have been previously disturbed. Potential habitat loss and fragmentation and reduced productivity and biological diversity could result. Siting at North Anna would have a MODERATE ecological impact that would be greater than renewal of Units 1 and 2 OLs.

At an alternate site, there would be construction impacts and new incremental operational impacts. The impacts would be the greatest at an alternate greenfield site. Even assuming siting at a previously disturbed area, the impacts would alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Use of cooling water from a nearby surface water body could have adverse aquatic resource impacts. If needed, construction and maintenance of the transmission line would have ecological impacts. Overall, the ecological impacts at an alternate site could be MODERATE to LARGE.

- **Water Use and Quality**

Surface water. The staff assumed that a replacement nuclear power plant at North Anna would use the existing cooling system, which would minimize incremental water-use and quality impacts. Surface-water impacts are expected to remain SMALL; the impacts would be sufficiently minor that they would not noticeably alter any important attribute of the resource.

For alternate sites, the impact on the surface water would depend on the volume of water needed for makeup, the discharge volume, and the characteristics of the receiving body of water. Intake from and discharge to any surface body of water would be regulated by the Commonwealth of Virginia or another state. The impacts would be SMALL to MODERATE.

Groundwater. The staff assumed that a new nuclear power plant located at North Anna would obtain potable, process, and fire-protection water from onsite groundwater wells similarly to the current practice for Units 1 and 2 (see Section 2.2.2). The impacts are considered SMALL.

A nuclear power plant sited at an alternate site may use groundwater. Groundwater withdrawal at an alternate site would likely require a permit. The impacts would depend on availability and how water is withdrawn, but overall are considered SMALL.

- **Air Quality**

Construction of a new nuclear power plant sited at the North Anna site or an alternate site would result in fugitive emissions during construction. Exhaust emissions would also emanate from vehicles and motorized equipment used during construction. An operating nuclear power plant would have minor air emissions associated with diesel generators. These emissions would be regulated by VDEQ or another state. Overall, emissions and associated impacts are considered SMALL.

- **Waste**

The waste impacts associated with operation of a nuclear power plant are set out in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, Table B-1. In addition to the impacts shown in Table B-1, construction-related debris would be generated during construction activities and removed to an appropriate disposal site. Overall, waste impacts are considered SMALL.

Siting the replacement nuclear power plant at a site other than North Anna would not alter waste generation. Therefore, the impacts would be SMALL.

- **Human Health**

Human health impacts for an operating nuclear power plant are set out in 10 CFR Part 51, Subpart A, Appendix B, Table B-1. Overall, human health impacts are considered SMALL.

Siting the replacement nuclear power plant at a site other than North Anna would not alter human health impacts. Therefore, the impacts would be SMALL.

- **Socioeconomics**

Construction and Operation. The construction period and the peak work force associated with construction of a new nuclear power plant are currently unquantified (NRC 1996). In

the absence of quantified data, the staff assumed a construction period of 5 years and a peak construction work force of 2500. The staff assumed that construction would take place while the existing North Anna Power Station, Units 1 and 2 continue operation and would be completed by the time Units 1 and 2 permanently cease operations. During construction, the communities surrounding North Anna would experience demands on housing and public services that could have SMALL to MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from more distant communities outside of Louisa County. After construction, the communities would be impacted by the loss of the construction jobs.

The replacement nuclear units are assumed to have an operating work force comparable to the 921 to 961 permanent and contract workers currently working at North Anna Power Station, Units 1 and 2. The replacement nuclear units would provide a new tax base to offset the loss of tax base associated with decommissioning of North Anna Power Station, Units 1 and 2. For all of these reasons, the appropriate characterization of non-transportation socioeconomic impacts for replacement nuclear units constructed at North Anna would be SMALL to MODERATE; the socioeconomic impacts would be noticeable, but would be unlikely to destabilize the area.

Socioeconomic impacts at alternate sites would need to be analyzed on a case-by-case basis. In the GEIS (NRC 1996), the staff noted that socioeconomic impacts at a rural site would be larger than at an urban site because more of the peak construction work force would need to move to the area to work. Construction of a replacement nuclear power plant at an alternate site would relocate some socioeconomic impacts, but would not eliminate them. Louisa County would experience the impact of North Anna Power Station, Units 1 and 2, operational job loss and loss of tax base, and the communities around the new site would have to absorb the impacts of a large, temporary work force (up to 2500 workers at the peak of construction) and a permanent work force of up to 961 workers. For Louisa County, the socioeconomic impacts could be LARGE. The socioeconomic impacts to the county at the alternate location could be SMALL to LARGE depending on the degree of economic development, the proportion of the county's property tax base represented by the new plant, etc.

Transportation. The addition of up to 2500 construction workers to the 921 to 961 permanent and contract workers at Units 1 and 2 could place significant traffic loads on existing highways, particularly those leading to North Anna. Such impacts would be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would be similar to current impacts associated with operation of Units 1 and 2 and are considered SMALL.

Transportation impacts associated with commuting workers at an alternate site are site-dependent but could be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would also be site-dependent but can be characterized as SMALL to MODERATE.

- **Aesthetics**

The containment buildings for a replacement nuclear power plant sited at North Anna and other associated buildings would likely be visible in daylight hours from offsite. Visual impacts could be mitigated by landscaping and selecting a color for buildings that is consistent with the environment. The visual impact could also be mitigated by below-grade construction. Visual impact at night could be mitigated by reducing lighting and using shielding appropriately. No exhaust stacks would be needed. No cooling towers would be needed, assuming use of the existing once-through cooling system.

Noise from operation of a replacement nuclear power plant would potentially be audible offsite in calm wind conditions or when the wind is blowing from the direction of the plant. Mitigation measures such as reducing or eliminating use of outside loudspeakers could reduce the noise level and keep the impact SMALL.

At an alternate site, there would be an aesthetic impact from the buildings. There would also be a significant aesthetic impact if a new transmission line were needed. Noise and light from the plant would be detectable offsite. The impact of noise and light could be mitigated if the plant is located in an industrial area adjacent to other power plants, in which case the impacts could be SMALL. The impact could be MODERATE if a new transmission line is needed to connect the plant to the power grid, or LARGE if a greenfield site is selected. Overall, the aesthetic impacts associated with locating at an alternate site can be categorized as SMALL to LARGE, depending on the characteristics of the alternate site.

- **Historic and Archaeological Resources**

At both the North Anna site and an alternate site, a cultural resource inventory likely would be needed for any onsite property not previously surveyed. Other lands, if any, that are acquired to support the plant likely would also need an inventory of field cultural resources, identification and recording of existing historic and archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction at North Anna or another site, studies likely would be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies likely would be needed for all areas of potential disturbance

at the proposed plant site and along associated rights-of-way where new construction would occur (e.g., roads, transmission line rights-of-way, rail lines, or other rights-of-way). Historic and archaeological resource impacts generally can be managed effectively and as such are considered SMALL.

- **Environmental Justice**

No environmental pathways or locations have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement nuclear power plant were built at North Anna. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect minority and low-income populations. However, this is expected to be mitigated by North Anna's proximity to Richmond. After completion of construction, it is possible that the local government's ability to maintain social services could be reduced at the same time that diminished economic conditions reduce employment prospects for minority and low-income populations. However, Louisa County's economic health should improve as the tax base of the older nuclear units are replaced by the new, higher-valued (i.e., less-depreciated) plant. Hence, the ability of the County to provide social services should improve because of the higher tax base, assuming assessment rates remain stable. Overall, socioeconomic impacts are expected to be SMALL.

Impacts at an alternate site would depend on the site chosen and the nearby population distribution. If a replacement nuclear power plant were constructed at an alternate site, Louisa County would experience a significant loss of property tax revenue which could affect the county's ability to provide services and programs. Impacts to minority and low-income populations in Louisa County could be MODERATE to LARGE but potentially offset by other related economic growth in the area. Impacts to the receiving county could be SMALL to LARGE and depend on the relative increase to the tax base resulting from the new plant's construction.

8.2.3.2 Closed-Cycle Cooling System

This section discusses the environmental impacts of constructing a nuclear power plant at an alternate site using closed-cycle cooling with cooling towers. The impacts (SMALL, MODERATE, or LARGE) of this option are essentially the same as the impacts for a nuclear power plant using the once-through cooling system. However, there are minor environmental differences between the closed-cycle and once-through cooling systems. Table 8-7 summarizes the incremental differences.

Table 8-7. Summary of Environmental Impacts of a New Nuclear Power Plant Sited at an Alternate Greenfield Site with Closed-Cycle Cooling

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 - 12 additional ha (25 - 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impact would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation.
Groundwater Use and Quality	No change.
Air Quality	No change.
Waste	No change.
Human Health	No change.
Socioeconomics	No change.
Aesthetics	Introduction of cooling towers and associated plume. Natural draft towers could be up to 158 m (520 ft). Mechanical draft towers could be up to 30 m (100 ft) high and also could have an associated noise impact.
Historic and Archaeological Resources	No change.
Environmental Justice	No change.

8.2.4 Purchased Electrical Power

If available, purchased power from other sources could potentially obviate the need to renew the North Anna Power Station, Units 1 and 2, OLs. VEPCo currently has purchase agreements for 145 MW from the Southeastern Power Administration and approximately 3500 MW of non-utility generation (VEPCo 2001). Overall, Virginia is a net importer of electricity.

To replace North Anna Power Station, Units 1 and 2, capacity with imported power, VEPCo would need to construct a new 500-kV transmission line that VEPCo estimates would be approximately 160 km (100 mi) long (VEPCo 2001). Assuming a 0.09-km (300-ft) easement width, the transmission line would impact approximately 15 km^2 (6 mi^2).

Imported power from Canada or Mexico is unlikely to be available for replacement of North Anna Power Station, Units 1 and 2, capacity. In Canada, 62 percent of the country's electricity capacity is derived from renewable energy sources, principally hydropower (DOE/EIA 2001b). Canada has plans to continue developing hydroelectric power, but the plans generally do not

include large-scale projects (DOE/EIA 2001b). Canada's nuclear generation is projected to increase by 1.7 percent by 2020, but its share of power generation is projected to decrease from 14 percent currently to 13 percent by 2020 (DOE/EIA 2001b). EIA projects that total gross U.S. imports of electricity from Canada and Mexico will gradually increase from 47.9 billion kWh in 2000 to 66.1 billion kWh in 2005 and then gradually decrease to 47.4 billion kWh in 2020 (DOE/EIA 2001a). On balance, it is unlikely that electricity imported from Canada or Mexico would be able to replace the North Anna Power Station, Units 1 and 2, capacity.

If power to replace North Anna Power Station, Units 1 and 2, capacity were to be purchased from sources within the United States or a foreign country, the generating technology would likely be one of those described in this SEIS and in the GEIS (probably coal, natural gas, or nuclear). The description of the environmental impacts of other technologies in Chapter 8 of the GEIS is representative of the purchased electrical power alternative to renewal of North Anna Power Station, Units 1 and 2, OLs. Thus, the environmental impacts of imported power would still occur, but would be located elsewhere within the region, nation, or another country.

8.2.5 Other Alternatives

Other generation technologies are discussed in the following sections.

8.2.5.1 Oil-Fired Generation

EIA projects that oil-fired plants will account for very little of the new generation capacity in the United States from 2000 to 2020 because of higher fuel costs and lower efficiencies (DOE/EIA 2001a). Oil-fired operation is more expensive than nuclear or coal-fired operation. Future increases in oil prices are expected to make oil-fired generation increasingly more expensive than coal-fired generation. The high cost of oil has prompted a steady decline in its use for electricity generation. Construction and operation of an oil-fired plant would also have environmental impacts. For example, in Section 8.3.11 of the GEIS, the staff estimated that construction of a 1,000-MW(e) oil-fired plant would require about 50 ha (120 ac). Additionally, operation of oil-fired plants would have environmental impacts (including impacts on the aquatic environment and air) that would be similar to those from a coal-fired plant.

8.2.5.2 Wind Power

The Commonwealth of Virginia is in a wind power Class 1 region (average wind speeds at 10-m [30-ft] elevation of 0 to 4.4 m/s [9.8 mph]). Class 1 has the lowest potential for wind energy generation (DOE 2001a). Wind turbines are economical in wind power Classes 4 through 7 (average wind speeds of 5.6 to 9.4 m/s [12.5 to 21.1 mph] [DOE 2001a]). Consequently, the staff concludes that locating a wind-energy facility on or near the North Anna site would not be economically feasible given the current state of wind energy generation technology.

8.2.5.3 Solar Power

Solar power technologies, photovoltaic and thermal, cannot currently compete with conventional fossil-fueled technologies in grid-connected applications due to the higher capital costs per kilowatt of capacity. The average capacity factor of photovoltaic cells is about 25 percent, and the capacity factor for solar thermal systems is about 25 to 40 percent (NRC 1996). Energy storage requirements limit the use of solar-energy systems as a baseload electricity supply.

There are substantial impacts to natural resources (wildlife habitat, land-use, and aesthetic impacts) from construction of solar-generating facilities. As stated in the GEIS, land requirements are high—14,000 ha (35,000 ac) per 1000 MW(e) for photovoltaic and approximately 6000 ha (14,000 ac) per 1000 MW(e) for solar thermal systems. Neither type of solar electric system would fit at the North Anna site, and both would have large environmental impacts at a greenfield site.

The North Anna site receives approximately 4 kWh of solar radiation per m^2 per day, compared to 7 to 8 kWh of solar radiation per m^2 per day in areas of the western United States, such as California, which are the most promising for solar technologies (DOE/EIA 2000a). Because of the natural resource impacts (land and ecological), the area's relatively low rate of solar radiation, and high cost, solar power is not deemed a feasible baseload alternative to renewal of the North Anna Power Station, Units 1 and 2 OLs. Some solar power may substitute for electric power in rooftop and building applications. Implementation of nonrooftop solar generation on a scale large enough to replace North Anna Power Station, Units 1 and 2, would likely result in LARGE environmental impacts.

8.2.5.4 Hydropower

Virginia has an estimated 617 MW of undeveloped hydroelectric resource (INEEL 1997). This amount is less than needed to replace the 1790 MW(e) capacity of North Anna Power Station, Units 1 and 2. As stated in Section 8.3.4 of the GEIS, hydropower's percentage of U.S. generating capacity is expected to decline because hydroelectric facilities have become difficult to site as a result of public concern about flooding, destruction of natural habitat, and alteration of natural river courses. In the GEIS, estimated land requirements for hydroelectric power are approximately 400,000 ha (1 million ac) per 1000 MW(e) (NRC 1996). Replacement of North Anna Power Station, Units 1 and 2, generating capacity would require flooding more than this amount of land. Due to the relatively low amount of undeveloped hydropower resource in Virginia and the large land-use and related environmental and ecological resource impacts associated with siting hydroelectric facilities large enough to replace North Anna Power Station, Units 1 and 2, the staff concludes that local hydropower is not a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs. Any attempts to site hydroelectric

facilities large enough to replace North Anna Power Station, Units 1 and 2, would result in LARGE environmental impacts.

8.2.5.5 Geothermal Energy

Geothermal energy has an average capacity factor of 90 percent and can be used for baseload power where available. However, geothermal technology is not widely used as baseload generation due to the limited geographical availability of the resource and immature status of the technology (NRC 1996). As illustrated by Figure 8.4 in the GEIS, geothermal plants are most likely to be sited in the western continental United States, Alaska, and Hawaii, where hydrothermal reservoirs are prevalent. There is no feasible eastern location for geothermal capacity to serve as an alternative to North Anna Power Station, Units 1 and 2. The staff concludes that geothermal energy is not a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.6 Wood Waste

A wood-burning facility can provide baseload power and operate with an average annual capacity factor of around 70 to 80 percent and with 20 to 25 percent efficiency (NRC 1996). 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 MW of generating capacity. 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 per MW of installed capacity 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 (NRC 1996). Like coal-fired plants, wood-waste plants require large areas for fuel storage and processing and involve the same type of combustion equipment.

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 determined that wood waste is not a feasible alternative to renewing the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.7 Municipal Solid Waste

Municipal waste combustors incinerate the waste and use the resultant heat to generate steam, hot water, or electricity. The combustion process can reduce the volume of waste by up to 90 percent and the weight of the waste by up to 75 percent (EPA 2001). Municipal waste combustors use three basic types of technologies: mass burn, modular, and refuse-derived fuel (DOE/EIA 2001c). Mass burning technologies are most commonly used in the United States. This group of technologies process raw municipal solid waste "as is," with little or no sizing,

shredding, or separation before combustion. 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 waste-handling equipment for municipal solid waste (NRC 1996).

Growth in the municipal waste combustion industry slowed dramatically during the 1990s after rapid growth during the 1980s. The slower growth was due to three primary factors: (1) the Tax Reform Act of 1986, which made capital-intensive projects such as municipal waste combustion facilities more expensive relative to less capital-intensive waste disposal alternatives such as landfills; (2) the 1994 Supreme Court decision (*C&A Carbone, Inc. v. Town of Clarkstown*), which struck down local flow-control ordinances that required waste to be delivered to specific municipal waste combustion facilities rather than at landfills that may have had lower fees; and (3) increasingly stringent environmental regulations that increased the capital cost necessary to construct and maintain municipal waste combustion facilities (DOE/EIA 2001c).

Municipal solid waste combustors generate an ash residue that is buried in landfills. The ash residue is composed of bottom ash and fly ash. Bottom ash refers to that portion of the unburned waste that falls to the bottom of the grate or furnace. Fly ash represents the small particles that rise from the furnace during the combustion process. Fly ash is generally removed from flue gases using fabric filters and/or scrubbers (DOE/EIA 2001c).

Currently, there are approximately 102 waste-to-energy plants operating in the United States. These plants generate approximately 2800 MW(e), or an average of approximately 28 MW(e) per plant (Integrated Waste Services Association 2001). The staff concludes that generating electricity from municipal solid waste would not be a feasible alternative to replace the 1790 MW(e) baseload capacity of North Anna Power Station, Units 1 and 2, and, consequently, would not be a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.8 Other Biomass-Derived Fuels

In addition to wood and municipal solid waste fuels, there are several other concepts for fueling electric generators including burning crops, converting crops to a liquid fuel such as ethanol, and gasifying crops (including wood waste). In the GEIS, the staff stated that none of these technologies has progressed to the point of being competitive on a large scale or being reliable enough to replace a baseload plant such as North Anna Power Station, Units 1 and 2 (NRC 1996). For these reasons, such fuels do not offer a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.9 Fuel Cells

Fuel cells work without combustion and its environmental side effects. Power is produced electrochemically by passing a hydrogen-rich fuel over an anode and air over a cathode and separating the two by an electrolyte. The only by-products are heat, water, and carbon dioxide. Hydrogen fuel can come from a variety of hydrocarbon resources by subjecting them to steam under pressure. Phosphoric acid fuel cells are generally considered first-generation technology. Higher-temperature, second-generation fuel cells achieve higher fuel-to-electricity and thermal efficiencies. The higher temperatures contribute to improved efficiencies and give the second-generation fuel cells the capability to generate steam for cogeneration and combined-cycle operations. DOE projects that by 2003, two second-generation fuel cell technologies using molten carbonate and solid oxide technology, respectively, will be commercially available in sizes up to 2 MW at a cost of $1000 to $1500 per kW of installed capacity (DOE 2001b). For comparison, the installed capacity cost for a natural gas-fired combined-cycle plant is on the order of $500 to $600 per kW (NWPPC 2000). As market acceptance and manufacturing capacity increase, natural gas-fueled fuel cell plants in the 50- to 100-MW range are projected to become available (DOE 2001b). Presently, fuel cells are not economically or technologically competitive with other alternatives for baseload electricity generation. Fuels cells are, consequently, not a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.10 Delayed Retirement

The only VEPCo generating plants currently scheduled for retirement are Possum Point, Units 1 and 2, located about 40 km (25 mi) south of Washington, D.C. These oil-fired units each have a nameplate-generating capacity[a] of 69 MW (DOE/EIA 2000b). Delayed retirement of Possum Point, Units 1 and 2, would not come close to replacing the 1790 MW(e) capacity of North Anna Power Station, Units 1 and 2. For this reason, delayed retirement of VEPCo generating units would not be a feasible alternative to renewal of the North Anna Power Station, Units 1 and 2, OLs.

8.2.5.11 Utility-Sponsored Conservation

VEPCo has developed residential, commercial, and industrial programs to reduce both peak demands and daily energy consumption. These programs are commonly referred to as demand-side management (DSM). VEPCo currently operates the following DSM programs: Rate Schedule SG (standby generation), Rate Schedule CS (curtailable service), Rider J (interruptible electric water heater service), and the Real Time Pricing Rate. VEPCo projects

(a) The nameplate-generating capacity is the full-load, continuous rating of a generating plant.

that by 2007, its DSM programs will reduce peak power requirements in the summer and winter by 74 and 130 MW, respectively (VEPCo 2001). VEPCo also projects that energy requirements in 2007 will be reduced by 14 gigawatt hours, 99 percent of which would be from load management programs (VEPCo 2001).

Historic and projected reduction in generation needs as a result of DSM programs have been credited in VEPCo's planning to meet projected customer demand. Because these DSM savings are part of the long-range plan for meeting projected demand, they are not available offsets for North Anna Power Station, Units 1 and 2. Therefore, the conservation option is not considered a reasonable replacement for the OL renewal alternative.

8.2.6 Combination of Alternatives

Although individual alternatives to North Anna Power Station, Units 1 and 2, might not be sufficient on their own to replace the capacity of these units due to size or cost, it is conceivable that a combination of alternatives might be cost-effective.

As discussed in Section 8.2, North Anna Power Station, Units 1 and 2, have a combined average net capacity of 1790 MW(e). For the coal and natural gas alternatives, VEPCo assumes in its ER three standard 508-MW(e) units as potential replacements for Units 1 and 2 (VEPCo 2001). This approach is followed in this SEIS, although it results in some environmental impacts that are roughly 17 percent lower than if full replacement capacity were constructed.

There are many possible combinations of alternatives. Table 8-8 summarizes the environmental impacts of an assumed combination of alternatives consisting of 1016 MW(e) of combined-cycle natural gas-fired generation at North Anna using the existing once-through cooling system, and at an alternate location using closed-cycle cooling, with 387 MW(e) purchased from other generators and 387 MW(e) gained from additional DSM measures. The impacts associated with the combined-cycle natural gas-fired units are based on the gas-fired generation impact assumptions discussed in Section 8.2.2, adjusted for the reduced generating capacity. While the DSM measures would have few environmental impacts, operation of the new gas-fired plant would result in increased emissions and environmental impacts. The environmental impacts of imported power would still occur but would be located elsewhere within the region, nation, or another country as discussed in Section 8.2.4. The environmental impacts associated with purchased power are not shown in Table 8-8. The staff concludes that it is very unlikely that the environmental impacts of any reasonable combination of generating and conservation options could be reduced to the level of impacts associated with renewal of the North Anna Power Station, Units 1 and 2, OLs.

Table 8-8. Summary of Environmental Impacts for an Assumed Combination of Generating and Acquisition Alternatives

	North Anna		Alternate Greenfield Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	SMALL to MODERATE	9 ha (23 ac) for powerblock, offices, roads, and parking areas Additional impact of up to approximately 295 ha (729 ac) for construction of an underground gas pipeline.	SMALL to LARGE	30 ha (74 ac) for powerblock, offices, roads, and parking areas. Additional impact for construction of an underground natural gas pipeline and a transmission line – MODERATE Greenfield site increases impact to LARGE.
Ecology	SMALL to MODERATE	Uses undeveloped areas at the North Anna site plus land for a new gas pipeline.	SMALL to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission and pipeline routes; potential habitat loss and fragmentation, reduced productivity, and biological diversity Greenfield site increases impact
Water Use and Quality				
Surface water	SMALL	Uses existing once-through cooling system.	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge and characteristics of surface water body
Groundwater	SMALL	Reduced groundwater withdrawals due to reduced work force.	SMALL	Groundwater impacts would depend on use and available supply
Air Quality	SMALL to MODERATE	Sulfur oxides • 81 MT/yr (89 tons/yr) Nitrogen oxides • 306 MT/yr (337 tons/yr) Carbon monoxide • 402 MT/yr (443 tons/yr) PM_{10} particulates • 120 MT/yr (132 tons/yr) Some hazardous air pollutants	SMALL to MODERATE	Same as siting at North Anna Power Station
Waste	SMALL	Small amount of ash produced.	SMALL	Same as siting at North Anna Power Station.
Human Health	SMALL	Impacts considered to be minor	SMALL	Impacts considered to be minor.

Table 8-8. (contd)

	North Anna		Alternate Greenfield Site	
Impact Category	Impact	Comments	Impact	Comments
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 1200 additional workers during the peak of the 3-year construction period, followed by reduction from current North Anna Power Station, Units 1 and 2, work force of 921 to 961 (permanent and contract) to approximately 150, tax base preserved Impacts during operation would be SMALL to MODERATE due to loss of employment to Louisa County.	SMALL to LARGE	Construction impacts depend on location, but could be significant if location is in a rural area. Louisa County would experience loss of tax base and employment with potentially LARGE impacts. Impacts during operation at an alternate site would be SMALL to MODERATE depending on economy at alternate site and relative impact of plant to tax base.
	SMALL to MODERATE	Transportation impacts associated with construction workers would be SMALL to MODERATE. Transportation impacts during operation would be SMALL due to smaller work force.	SMALL to LARGE	Transportation impacts associated with construction workers would be SMALL to LARGE and dependent on population density at alternative site. Impacts during operation would be SMALL due to smaller work force.
Aesthetics	SMALL	Some visibility of structures offsite.	SMALL to LARGE	SMALL if alternate site previously developed. MODERATE impact from plant, stacks, cooling tower plumes, and new transmission lines. LARGE if greenfield site.
Historic and Archaeological Resources	SMALL	Any potential impacts likely can be managed effectively.	SMALL	Any potential impacts likely can be managed effectively.
Environmental Justice	SMALL to 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 approximately 750 operating jobs at North Anna could reduce employment prospects for minority and low-income populations	SMALL to LARGE	Impacts at alternate site vary depending on population distribution and makeup at site. Louisa County would lose significant revenue, which could have MODERATE to LARGE impacts to minority and low-income populations Impacts to receiving County could be SMALL to MODERATE

8.3 Summary of Alternatives Considered

The environmental impacts of the proposed action, license renewal, are SMALL for all impact categories (except 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, i.e., no-action alternative (discussed in Section 8.1), new generation alternatives (from coal, natural gas, and nuclear, discussed in Sections 8.2.1 through 8.2.3,

respectively), purchased electrical power (discussed in Section 8.2.4), alternative technologies (discussed in Section 8.2.5), and the combination of alternatives (discussed in Section 8.2.6) were considered.

The no-action alternative would result in decommissioning North Anna Power Station, Units 1 and 2, and would require replacing electrical generating capacity by (1) DSM and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than North Anna Power Station, Units 1 and 2, or (4) some combination of these options. For each of the new generation alternatives (coal, natural gas, and nuclear), the environmental impacts would not be less than the impacts of license renewal. For example, the land-disturbance impacts resulting from construction of any new facility would be greater than the impacts of continued operation of North Anna Power Station, Units 1 and 2. The impacts of purchased electrical power (imported power) would still occur, but would occur elsewhere. Alternative technologies are not considered feasible at this time, and it is very unlikely that the environmental impacts of any reasonable combination of generation and conservation options could be reduced to the level of impacts associated with renewal of the OLs for North Anna Power Station, Units 1 and 2.

The staff concludes that the alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

8.4 References

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy,* Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Functions."

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy,* Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR Part 50. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 50, "National Primary and Secondary Ambient Air Quality Standards."

40 CFR Part 51. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans."

40 CFR Part 60. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 60, "Standards of Performance for New Stationary Sources."

40 CFR Part 81. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 81, "Designation of Areas for Air Quality Planning Purposes."

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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, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

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9.0 Summary and Conclusions

By letter dated May 29, 2001, the Virginia Electric and Power Company (VEPCo) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for North Anna Power Station, Units 1 and 2, for an additional 20-year period (VEPCo 2001). If the OLs are renewed, State regulatory agencies and VEPCo will ultimately decide whether the plants 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, then the plants must be shut down at or before the expiration date of the current OLs, which is April 1, 2018, for Unit 1 and August 21, 2020, for Unit 2.

Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321), directs that 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. Part 51 identifies licensing and regulatory actions that require an EIS. 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, Volumes 1 and 2 (NRC 1996; 1999).[a]

Upon acceptance of the VEPCo 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 (66 FR 46294 [NRC 2001]) for North Anna on September 4, 2001. The staff visited North Anna in October 2001 and held public scoping meetings on October 18, 2001, in Louisa County, Virginia. The staff reviewed the VEPCo Environmental Report (ER) (VEPCo 2001) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff also considered the public comments received during the scoping process for preparation of this Supplemental Environmental Impact Statement (SEIS) for North Anna Power Station, Units 1 and 2. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part I, of this SEIS.

On May 17, 2002, the U.S. Environmental Protection Agency (EPA) published the Notice of Availability of the draft SEIS (67 FR 35108 [EPA 2002]). A 75-day comment period began on that date, during which members of the public could comment on the preliminary results of the NRC staff's review.

(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.

The staff held two public meetings near North Anna Power Station on June 25, 2002 to describe the preliminary results of the NRC environmental review and to answer questions and provide members of the public with information to assist them in formulating their comments. At the end of comment period, the staff considered all of the comments received for revision of the SEIS. These comments are addressed in Appendix A, Part II, of the final SEIS.

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

The NRC 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) decisionmakers.

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, even if an OL is renewed, there are other factors that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OL.

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) 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 NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

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 specified plant or site characteristic.

(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.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions as amplified by supporting information in

(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."

the GEIS for issues designated Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

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, 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.

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 OLs for North Anna Power Station, Units 1 and 2) and alternative methods of power generation. These alternatives were evaluated assuming that the replacement power generation plant is located at either the North Anna site or some other unspecified location.

9.1 Environmental Impacts of the Proposed Action—License Renewal

VEPCo 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 VEPCo nor the staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither VEPCo nor the staff has identified any new issue applicable to North Anna Power Station that has a significant environmental impact. These determinations include the consideration of public comments. Therefore, the staff relies upon the conclusions of the GEIS for all Category 1 issues that are applicable to North Anna Power Station, Units 1 and 2.

VEPCo's license-renewal application presents an analysis of the Category 2 issues that are applicable to North Anna Power Station, Units 1 and 2. In addition, the staff has evaluated the two uncategorized issues, environmental justice and chronic effects from electromagnetic fields. The staff has reviewed the VEPCo 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 North Anna. Four Category 2 issues are not discussed in this SEIS because they are specifically related to refurbishment. VEPCo (VEPCo 2001) 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 as

necessary to support the continued operation of North Anna Power Station, Units 1 and 2, for the license renewal period. In addition, any 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 Statement Related to the Continuation of Construction and the Operation of North Anna Units 1 and 2 and the Construction of Units 3 and 4* (AEC 1973), and the two addenda to the final environmental statements related to the operation of North Anna Power Station, Units 1 and 2 (NRC 1976 and NRC 1980).

Twelve Category 2 issues related to operational impacts and postulated accidents during the renewal term, 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 discussed in this SEIS only 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 determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic 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. Based on its review of the SAMAs for North Anna Power Station, Units 1 and 2, and the plant improvements already made, the staff concludes that none of the candidate SAMAs are cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate the environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted.

The following sections 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 already occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

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 if North Anna Power Station, Units 1 and 2, cease operation at or before the expiration of the current OLs will not be smaller than those associated with continued operation of these units, and they may be greater for some impact categories in some locations.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of North Anna Power Station, Units 1 and 2, 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 offsite storage space. North Anna Power Station, Units 1 and 2, replace approximately one-third of the fuel assemblies in each of the two units during every refueling outage, which occurs on an 18-month cycle.

If North Anna Power Station, Units 1 and 2, cease operation on or before the expiration of the current OLs, the likely power generation alternatives 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 North Anna Power Station site was set when the plants were approved and construction began. That balance is now well established. Renewal of the OLs for North Anna Power Station, Units 1 and 2, and continued operation of the plants will not alter the existing balance, but 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 North Anna Power Station 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 North Anna Power Station, Units 1 and 2. Chapter 2 describes the site, power plants, and interactions of the plants with the environment. As noted in Chapter 3, no refurbishment and no refurbishment impacts are expected at North Anna Power Station, Units 1 and 2. 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 and use reduction 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 nuclear, coal, or gas generation of power at North Anna Power Station, Units 1 and 2, an unspecified "greenfield site," and a combination of alternatives are compared in Table 9-1.

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 HLW and spent fuel disposal, for which a single significance level was not assigned [see Chapter 6]). 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

Based on (1) the analysis and findings in the GEIS (NRC 1996; 1999), (2) the ER submitted by VEPCo (VEPCo 2001), (3) consultation with Federal, State, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments, the recommendation of the staff is that the Commission determine that the adverse environmental impacts of license renewal for North Anna Power Station, Units 1 and 2, are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation

	Proposed Action	No-Action Alternative	Coal-Fired Generation		Natural Gas-Fired Generation		New Nuclear Generation		Combination of Alternatives	
Impact Category	License Renewal	Denial of Renewal	North Anna Site	Alternate Greenfield Site	North Anna Site	Alternate Greenfield Site	North Anna Site	Alternate Greenfield Site	North Anna Site	Alternate Greenfield Site
Land Use	SMALL	SMALL	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to LARGE
Ecology	SMALL	SMALL	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to LARGE
Water Use and Quality	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL	MODERATE	MODERATE	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Human Health	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE
Transportation	SMALL	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL to LARGE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE
Aesthetics	SMALL	SMALL	SMALL to MODERATE	SMALL to LARGE	SMALL	SMALL to LARGE	SMALL	SMALL to LARGE	SMALL	SMALL to LARGE
Historic and Archaeological Resources	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Environmental Justice	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE

(a) Except for collective offsite radiological impacts from the fuel cycle and from HLW and spent-fuel disposal, for which a significance level was not assigned. See Chapter 6 for details.

9.4 References

10 CFR Part 51. Code of Federal Regulations, *Title 10, Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, *Title 10, Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

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

U.S. Atomic Energy Commission (AEC). 1973. *Final Environmental Statement Related to the Continuation of Construction and Operation of Units 1 and 2 and the Construction of Units 3 and 4 of the North Anna Power Station.* Docket Nos. 50-338 and 50-339, Washington, D.C.

U.S. Environmental Protection Agency (EPA). 2002. "Notice of Availability of Environmental Impact Statements". Federal Register, Vol. 67, No. 96, p. 35108 (May 17, 2002).

U.S. Nuclear Regulatory Commission (NRC). 1976. *Addendum to the Final Environmental Statement Related to Operation of North Anna Power Station, Units 1 and 2.* Docket Nos. 50-338 and 50-339, NUREG-0134. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1980. *Addendum to the Final Environmental Statement Related to Operation of North Anna Power Station, Units 1 and 2.* Docket Nos. 50-338 and 50-339, NUREG-0134. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Volumes 1 and 2, 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, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000. *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). 2001. "Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process." *Federal Register.* Vol. 66, No. 171, pp. 46294 - 46295 (September 4, 2001).

Virginia Electric and Power Company (VEPCo). 2001. *Application for License Renewal for North Anna Power Station, Units 1 and 2,* "Appendix E, Environmental Report - Operating License Renewal Stage." Richmond, Virginia.

Appendix A

Comments Received on the Environmental Review

Appendix A

Comments Received on the Environmental Review

Part I - Comments Received During Scoping

On September 4, 2001, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent in the Federal Register (66 FR 46294), to notify the public of the staff's intent to prepare a plant-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2, to support the renewal application for the North Anna Power Station operating licenses and to conduct scoping. This plant-specific supplement to the GEIS has been prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) guidelines, and 10 CFR Part 51. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. 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 scheduled public meetings and/or submitting written suggestions and comments no later than November 5, 2001.

The scoping process included two public scoping meetings, which were held at the Louisa County Office Building in Louisa County, Virginia on October 18, 2001. Approximately 45 individuals attended the meetings. Each session began with NRC staff members providing brief overviews of the license renewal process and the NEPA process. After the NRC's prepared statements, the meetings were opened for public comments. Eighteen attendees provided either oral statements that were recorded and transcribed by a certified court reporter or written statements. The meeting transcripts are an attachment to the Scoping Meeting Summary dated November 6, 2001. In addition to the comments provided during the public meetings, three comment letters and an email were received by the NRC in response to the Notice of Intent.

At the conclusion of the scoping period, the NRC staff and its contractors reviewed the transcripts and all written material received to identify specific comments and issues. Each set of comments from an individual was given a unique identifier (Commenter ID), so that the comments could be traced back to the original transcript, letter, or e-mail containing the comment. Specific comments were numbered sequentially within each comment set. Several commenters submitted more than one set of comments (e.g., they made statements in both the afternoon and evening scoping meetings). In these cases, there is a unique Commenter ID for each set of comments.

Table A-1 identifies the individuals who provided comments applicable to the environmental review and gives the Commenter ID associated with each set of comments. Individuals who spoke at the scoping meetings are listed in the order in which they spoke at the public meeting.

Appendix A

Table A-1. Individuals Providing Comments During Scoping Comment Period

Commenters ID	Commenter	Affiliation (If Stated)	Comment Source and ADAMS Accession Number(a)
NAS-A	Lee Lintecum	Louisa County	Afternoon Scoping Meeting
NAS-B	Linda Edwards	Louisa County	Afternoon Scoping Meeting
NAS-C	Jimmy Candeto	Mineral Town Manager	Afternoon Scoping Meeting
NAS-D	Duff Green	Orange County	Afternoon Scoping Meeting
NAS-E	Ashland Fortune	Louisa County Sheriff	Afternoon Scoping Meeting
NAS-F	William Hayden	President of Lake Anna Civic Association	Afternoon Scoping Meeting
NAS-G	Jerry Rosenthal	Concerned Citizens of Louisa	Afternoon Scoping Meeting
NAS-H	Lisa Gue	Public Citizen	Afternoon Scoping Meeting
NAS-J	Dave Heacock	Dominion	Afternoon Scoping Meeting
NAS-K	Bill Bolin	Dominion	Afternoon Scoping Meeting
NAS-L	Ashland Fortune	Louisa County Sheriff	Evening Scoping Meeting
NAS-M	V Earl Dickinson	Virginia General Assembly	Evening Scoping Meeting
NAS-N	Mary Lou Dickinson	LinkAges Community Services	Evening Scoping Meeting
NAS-P	Donald Gallihugh	Mayor of Louisa	Evening Scoping Meeting
NAS-Q	Edward Kube	Louisa County Board of Supervisors	Evening Scoping Meeting
NAS-R	Jerry Rosenthal	Concerned Citizens of Louisa	Evening Scoping Meeting
NAS-S	Tom Filen	Louisa Chamber of Commerce and Virginia Community Bank	Evening Scoping Meeting
NAS-T	Hugh Jackson	Public Citizen	Evening Scoping Meeting
NAS-U	Matthew Kersey	Town of Louisa	Evening Scoping Meeting
NAS-V	Lisa Gue	Public Citizen	Evening Scoping Meeting
NAS-W	Dave Heacock	Dominion	Evening Scoping Meeting
NAS-X	Bill Bolin	Dominion	Evening Scoping Meeting
NAS-Y	Bill Murphey	Citizen of Louisa County	Evening Scoping Meeting
NAS-Z	Jerry Rosenthal	Concerned Citizens of Louisa	Email - Letter (ML013460243)
NAS-AA	John Wolflin	U S Fish and Wildlife Service	Letter (ML013460246)
NAS-AB	R Edward Houck	Senate of Virginia	Letter (ML012920545)
NAS-AC	Honorable Eric Cantor	U.S. Congress	Letter (ML013650011)

(a) The afternoon and evening transcripts can be found under accession number ML013120266

To maintain consistency with the scoping summary report (North Anna Power Station Scoping Summary Report, dated January 2, 2002), the unique identifier used in that report for each set of comments is retained in this report.

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by the commenters. The comments fall into one of several general groups. These groups include

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 or Category 2 issues or issues that were not addressed in the GEIS. They also address alternatives and related Federal actions.

- General comments (1) in support of or opposed to nuclear power or license renewal or (2) on the license renewal process, the NRC's regulations, and the regulatory process. These comments may or may not be specifically related to the North Anna Power Station license renewal application.

- Questions that do not provide new information.

- Specific comments that address issues that do not fall within or are specifically excluded from the purview of NRC environmental regulations. These comments typically address issues such as the need for power, emergency preparedness, current operational safety issues, and safety issues related to operation during the renewal period.

Each comment applicable to this environmental review is summarized in this section. This information, which was extracted from the North Anna Power Station Scoping Summary Report, is provided for the convenience of those interested in the scoping comments applicable to this environmental review. The comments that are general or outside the scope of the environmental review for North Anna Power Station are not included here. More detail regarding the disposition of general or nonapplicable comments can be found in the summary report. The ADAMS accession number for the summary report is ML020160608. This accession number is provided to facilitate access to the document through the Public Electronic Reading Room (ADAMS) http: //www.nrc.gov/reading-rm.html.

The following pages summarize the comments and suggestions received as part of the scoping process that are applicable to this environmental review, and discuss the disposition of the comments and suggestions. The parenthetical alpha-numeric identifier after each comment refers to the comment set (Commenter ID) and the comment number.

Comments in this section are grouped in the following categories:

1. Comments Concerning Category 1 Socioeconomic Issues
2. Comments Concerning Category 1 Air-Quality Issues

3. Comments Concerning Category 1 Human Health Issues
4. Comments Concerning Aquatic Resource Issues
5. Comments Concerning Terrestrial Resource Issues
6. Comments Concerning Category 1 Postulated Accident Issues
7. Comments Concerning Category 1 Uranium Fuel Cycle and Waste Management Issues
8. Comments Concerning Category 2 Socioeconomic Issues
9. Comments Concerning Category 2 Aquatic Ecology Species Issues
10. Comments Concerning Category 2 Threatened and Endangered Species Issues.

1. Comments Concerning Category 1 Socioeconomic Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 socioeconomic issues include:

- Public services: public safety, social services, and tourism and recreation
- Public services: education (license renewal term)
- Aesthetics impacts (refurbishment)
- Aesthetics impacts (license renewal term)
- Aesthetics impacts of transmission lines (license renewal term).

Comment: We have found Dominion to be a very good corporate citizen. (NAS-A-1)

Comment: Dominion has proved to be a very good civic citizen, contributing both time and financial resources. (NAS-A-4)

Comment: Dominion Power has for many years provided marketing material in economic development. (NAS-B-2)

Comment: Their employees [Dominion] are also generous with their money. (NAS-C-7)

Comment: Virginia Power also has kept food on people's tables here, clothes on the children's backs, helped the school system, given millions of dollars a year to needy families. (NAS-E-2)

Comment: Dominion quickly stepped forward with an offer to let us use their Visitor Center facilities and, in addition, donated $1,000 to us to assist in funding the program. (NAS-F-4)

Comment: We have a longstanding tradition at North Anna and Dominion of investing in our communities. (NAS-J-15)

Comment: We [North Anna] are involved in community stewardship in many fronts. (NAS-K-4)

Comment: The new schools, many things that you see that we have developed in Louisa County could not have happened if we did not have this additional revenue coming from the power plant. (NAS-M-8)

Comment: Along with that, we have one of the nicest Little League ball diamonds in the State of Virginia, and that was done through Dominion Power. (NAS-N-3)

Comment: Through the development of the water source needed to maintain water temperatures, the Dominion Virginia Power has created one of the premier lakes in the State of Virginia for all who enjoy various recreational activities. (NAS-P-9)

Comment: So they [North Anna] do lots of public service and volunteerism in our community. (NAS-Q-3)

Comment: I have served the last two years as President of the Chamber of Commerce and can tell you that we didn't have a more supportive member than Virginia Power. (NAS-S-1)

Comment: I'm personally in support of this, and on behalf of the Chamber of Commerce I can't tell you that we've had a better neighbor or friend to our economic community. (NAS-S-2)

Comment: Their contributions through tax dollars enabled us to build three fine elementary schools in the county. There have been expansions to the high school, the middle school, a number of other public facilities. (NAS-U-2)

Comment: They've been a good corporate citizen. (NAS-U-3)

Comment: As mentioned several times tonight, we also pride ourselves at Dominion in an active role in whatever community we are a part of, and North Anna is no exception. (NAS-X-3)

Comment: One that I'd like to highlight tonight of particular importance at North Anna is the partnership with the Lake Anna State Park. (NAS-X-4)

Comment: Dominion Resources, through the Employee Volunteer Program, facilitates the donation of tens of thousands of volunteer hours to projects which directly benefit the communities where employees work and live. Financial support for civic and charitable endeavors are provided as well. (NAS-AB-4)

Comment: Many of these [North Anna] employees routinely volunteer their time and resources to help make their communities better places in which to live. The employee volunteer program facilitates the donation of tens of thousands of volunteer hours to projects that directly benefit

the communities in which the employees work and live. Financial support for civic and charitable endeavors are provided as well. (NAS-AC-3)

Comment: Plant and marine life in Lake Anna are at healthy levels, and Lake Anna continues to be a major recreational area and one of Virginia's outstanding freshwater fishing spots. (NAS-AC-6)

Response: *The comments are noted. The comments are supportive of license renewal at the North Anna Power Station, Units 1 and 2. Public services were evaluated in the GEIS and determined to be a Category 1 issue. Information regarding the impact on education will be discussed in Chapter 4 of the SEIS.*

2. Comments Concerning Category 1 Air Quality Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 air quality issues include:

- Air-quality effects of transmission lines.

Comment: The primary advantage of a nuclear plant is that it doesn't produce any carbon -- doesn't emit any carbon dioxides, carbon monoxides, nitrous oxides, sulfur dioxides. All of those things are not emitted at the plant during normal operation. (NAS-J-11)

Comment: So we don't have an impact for greenhouse gases like you might have from a replacement plant, and that's one factor that goes into this decision. (NAS-J-12)

Comment: Thirdly, electricity provided from the North Anna Power Station is emission free energy. (NAS-M-5)

Response: *The comments are noted. Air quality impacts from plant operations were evaluated in the GEIS and found to be minimal. These emissions are regulated through permits issued by the U.S. Environmental Protection Agency and Virginia. Air Quality will be discussed in Chapter 2 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.*

3. Comments Concerning Category 1 Human Health Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 human health issues include:

- Radiation exposure to the public during refurbishment
- Occupational radiation exposure during refurbishment
- Microbiological organisms (occupational health)
- Noise
- Radiation exposures to public (license renewal term)
- Occupational radiation exposures (license renewal term).

Comment: We need to deal with the regular releases that come from the plant, the radioactivity that is regularly vented off of the reactors. (NAS-G-10)

Comment: In terms of I heard the gentleman from Lake Anna Civic Association talk about all of the things they're checking at the lake, but radioactivity was not one of them. That's seems incongruous that they would be checking fecal samples, but next to a nuclear plant they're not interested in checking for radioactivity in either the water, the fish, the algae? (NAS-G-11)

Comment: The Russian experience has shown over a long period of time a lot of the radioactivity ends up sinking to the bottom in the mud. This type of stuff needs to be checked. (NAS-G-12)

Comment: Power plants are not only poised on the brink of this kind of catastrophic accident [Chernobyl] at all times, but also releasing routine amounts of radiation into the air and the water. (NAS-H-4)

Response: *The comments are noted. Impacts from routine radiological releases are addressed in Chapters 2 and 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.*

Comment: It would be advantageous to have independent monitors, separate from the nuclear power company itself or the Nuclear Regulatory Commission. Let's get some independent monitors, and let's monitor the workers. What is the long-term health of the workers? Let's do epidemiological studies. Let's monitor the community. Let's monitor the environment, all -- all completely independently. (NAS-G-13)

Comment: I discussed the need for independent monitoring of the workers at the plant long term, of the community long term, of the environment long term. This is independent, not just what is done by the state and what is done by Virginia Power. (NAS-R-7)

Comment: There exists a need for independent monitoring of all environmental matters -- air, water, lake bottom, vegetation. (NAS-Z-18)

Comment: There should be independent monitoring of workers' health and community health (epidemiological studies over time). These should be funded by the utility and overseen by completely independent (not utility or state or federal) professionals. This requirement in a license renewal will help provide greater public trust in the process. Has there been a problem in the past? YOU BET! (NAS-Z-19)

Response: *The comments are noted. Radiation exposure to the public and workers was evaluated in the GEIS and determined to be a Category 1 issue. The requirements for monitoring of the environment are beyond the scope of license renewal. The NRC requires the licensee to routinely conduct radiological monitoring of all plant effluents, as well as foodstuffs and biota. The NRC also communicates with permitting agencies that administer the Clean Water Act and the Clean Air Act, State radiological agencies, the Fish and Wildlife Service, and other organizations. Any potential noncompliance of monitoring requirements is an operational safety issue, handled through the inspection and reporting process, and is therefore beyond the scope of license renewal. The comments provide no new information, and do not pertain to the scope of license renewal as set in 10 CFR Part 51 and Part 54. Therefore, they will not be evaluated further.*

4. Comments Concerning Aquatic Resource Issues

Comment: Dominion biologists regularly monitor the health of the fish in Lake Anna. (NAS-C-5)

Comment: After the lake was created and flooded, they monitored the aging or maturing of the lake for over 20 years on a continuous basis at a number of sampling points to insure that no negative impacts were developing. (NAS-F-1)

Comment: The formation of Lake Anna immediately improved conditions in the Contrary Creek arm of the lake, as well as the North Anna River below the dam. (NAS-X-2)

Response: *The comments are noted. Aquatic ecology will be discussed in Chapters 2 and 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.*

Comment: Page 2-2. The Service is concerned with the impacts to fish and aquatic vegetation (Issue # 3 & 19) associated with the structures described as, "In addition to the two

nuclear reactors, their turbine building, intake structure, discharge canal, and auxiliary buildings." Our concerns also include the impacts of dams on the passage and distribution of fish and mussel species. (NAS-AA-1)

Comment: Page 2-8. What is your reference for a healthy fish population stated in, "Reservoirs like Lake Anna with healthy populations of "landlocked" small shad and herring. (Lake Anna has both threadfin shad (*Dorosoma petenense*) and blueback herring (*Alosa aestivalis*), are often dominated by small-bodied zooplankters (rotifers and copepods), because larger-bodied forms are selectively preyed upon by schooling clupeids (Ref. 2.2-11)." (NAS-AA-2)

Comment: Page 2-9. How do you account for the reduction in abundance of yellow perch, black crappie, pumpkinseed sunfish and an increase in other species of fish as stated in "The community structure remained relatively stable over the 1975-1985 period, with some year-to-year variation in species composition caused by: (1) normal population fluctuations; (2) reservoir aging; (3) the introduction of forage species and competing predators; (4) the installation of fish attractors and artificial habitat; and (5) the increase in Corbicula densities. Post-1975 changes included: (1) a decline in relative abundance of yellow perch (*Perca flavescens*) and black crappie (*Promoxis nigromaculatus*); (2) an increase in relative abundance of white perch (*Morone americana*) and threadfin shad; and (3) an increase in redear sunfish (*Lepomis microlophus*) abundance, with a corresponding decrease in pumpkinseed (*Lepomis gibbosus*). None of these changes appeared to be related to NAPS operation." (NAS-AA-3)

Response: *The comments/questions are noted. They do not provide any new information. However, NRC plans to discuss these issues further with the Fish and Wildlife Service (FWS) because it is a cognizant Federal agency.*

Comment: Page 2-10. There continues to be disagreement between the scientific community as to the historical range of anadromous fish spawning habitat in the North Anna River. American shad, hickory shad, blueback herring, sea lamprey, and American eel are reported to migrate to the base of the Ashland Mill Dam on the South Anna River. The VEPCo report states, "Four non-native fish species (striped bass, walleye, threadfin shad, and blueback herring) have been stocked in Lake Anna by the Virginia Department of Game & Inland Fisheries since 1972. Striped bass were introduced in 1973, and have been stocked annually since 1975. They provide a "put-grow-and-take" fishery; streams, including the North Anna River that flow into Lake Anna lack the flow, depth, and length to support striped bass spawning runs. Studies show that striped bass grow and provide a substantial recreational fishery in Lake Anna, but adults are subject to late-summer habitat restrictions (limited to cooler-water refuge areas) and growth limitations. Walleye are also stocked annually by the Virginia Department of Game & Inland Fisheries and are highly sought-after game fish. Threadfin shad

were introduced in 1983 to provide additional forage for striped bass and other top-of-the-food-chain predators. This species is vulnerable to cold shock and winter kills, and would not be able to survive in Lake Anna if it were not for NAPS operation. Threadfin shad appear to be thriving in Lake Anna and are an important source of food for game fish. Blueback herring, fish stocked by the Virginia Department of Game & Inland Fisheries in 1980 as a forage species, have not been as successful. A fifth non-native species, the herbivorous grass carp, was stocked by Dominion (with the approval of the Virginia Department of Game & Inland Fisheries) in the WHTF in 1994 to control growth of the nuisance submersed aquatic plant hydrilla (*Hydrilla verticillata*)." (NAS-AA-4)

Comment: Page 2-11. The water flow in the North Anna River System changed drastically after the impoundment was created. The reduction in river flow from Lake Anna during the Spring spawning migration may limit the range of anadromous and riverine species of fish in the river. The report describes the river as, "The North Anna River joins the South Anna River 23 miles downstream from the North Anna Dam, forming the Pamunkey River. Before 1972, when the river was impounded, flows varied considerably (1 to 24,000 cfs) from year to year and water quality was degraded by acid mine drainage from Contrary Creek. After 1972, fluctuations in flow were moderated (40 to 16,000 cfs from 1972 through 1985) and water quality was improved as a result of reclamation activities at the Contrary Creek mine site and the acid-neutralizing effect of Lake Anna's waters. Water quality downstream from the North Anna Dam is strongly influenced by conditions in the reservoir and releases at the Dam. Water moving from Lake Anna to the North Anna River is less turbid and more chemically stable than the pre-impoundment flow. Dissolved oxygen levels are high (averaging 9.6 milligrams per liter over the 1981-1985 period) immediately downstream of the Dam and increase further downstream, presumably as a result of turbulent mixing (Ref. 2.2-3). Summer water temperatures from 1970-1985 were higher near the Dam than downstream, reflecting temperatures in the reservoir. The highest water temperature recorded in pre-operational years was 89.4°F in July 1977, at a station one kilometer below the North Anna Dam. The highest temperature recorded in operational years was slightly higher, 90.9°F, recorded in August 1983 at the same station." Each of these flow related impacts warrant additional river flow study. (NAS-AA-5)

Comment: Page 3-15. The Service believes the North Anna Hydroelectric project and the dam may be causing significant impacts to the North Anna River and the results from earlier studies should be reevaluated. The report states, "An exemption from licensing (Ref. 3.5-1) was filed with the Federal Energy Regulatory Commission (FERC) in March 1984; an order granting the exemption was issued in September 1984. As part of the exemption from licensing by FERC, the U.S. Fish and Wildlife Service requested that Dominion perform pre-operational and operational fish passage studies to evaluate the need for intake screening. Studies were conducted in 1986, 1987, and 1988 (Ref. 3.5-3). Results of these studies indicated that the

number of fish passing from Lake Anna to the North Anna River was minimal (Ref. 3.5-4). (NAS-AA-6)

Response: *The comments are noted. The comments relate to impacts associated with the construction or operation of the North Anna Dam. Construction impacts are beyond the scope of this review. Operational impacts during the license renewal term will be addressed in the SEIS.*

Comment: Page 2-12. The Service's main goal is the protection and restoration of ecosystems for people. During a license review, the Service' mitigation goal is to work with the license applicant to avoid, minimize, and compensate (in that order) to the fullest extent possible. The National Environmental Policy Act calls for past, present, and future environmental impacts be identified, as well as summarized to determine cumulative effects of the environmental impacts. The VEPCo report clearly identifies ecosystem impacts, but the Service disagrees with VEPCo's conclusion regarding fish and the ecosystem. The report states, "In pre-impoundment surveys, the fish community of the North Anna River downstream from the Contrary Creek inflow was dominated by pollution-tolerant species. In the years following impoundment (and reclamation of the Contrary Creek mine site), there was a steady increase in measures of abundance and diversity (species richness) of fish. In 1984-85, 38 species from 10 families were found in the North Anna River, compared to 25 species from eight families in the control stream, the South Anna River. When reservoir species from Lake Anna were subtracted from the North Anna River totals, the two fish communities showed striking similarities, indicating that operation of NAPS has had little or no effect on fish populations downstream from the North Anna Dam." "Based on the 1999 Annual Report for Lake Anna and the North Anna River, the North Anna River downstream of the North Anna Dam has no major changes in the ecosystem (Ref. 2.2-10). A review of the data from the 1999 monitoring studies indicate that Lake Anna and the North Anna River continue to contain healthy, well-balanced ecological communities." (NAS-AA-16)

Response: *The comment is noted. The comment relates to cumulative impact issues and will be considered in the preparation of the SEIS. Aquatic resources are discussed in Chapters 2 and 4 of the SEIS.*

Comment: Page 6-2. The Service believes many of the impacts discussed above will fall under this policy [mitigation]. We do not agree that all impacts of license renewal are small and would not require mitigation. The current operations do include some mitigation activities that would continue during the term of the license renewal, but additional efforts in the areas of fisheries, water quality, and possibly endangered species will protect and enhance the natural resources in Lake Anna and North Anna River. As stated, Dominion performs routine mitigation and monitoring activities associated with environmental permits to ensure the safety of workers,

the public, and the environment. These activities include the radiological environmental monitoring program, continuous emission monitoring, monitoring of aquatic biota that could be affected by NAPS operation, effluent chemistry monitoring, and effluent toxicity testing." As the NRC's statutory requirements state, "The report must contain a consideration of alternatives for reducing adverse impacts...for all Category 2 license renewal issues.... 10 CFR 51.53(c)(3)(iii). The environmental report shall include an analysis that considers and balances...alternatives available for reducing or avoiding adverse environmental effects.... 10 CFR 51.45(c) as incorporated by 10 CFR 51.53(c)(2)." (NAS-AA-17)

Response: *The comment is noted. Mitigation will be considered for all Category 2 issues that are applicable. [For Category 1 issues, Table B-1 in Subpart A of Part 51 states that mitigation has been considered in the staff's analysis of these issues, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. Unless the staff finds new and significant information in relation to these issues, the NRC will adopt the conclusion from Table B-1.] The comment did not provide any new information. However, the NRC plans to discuss this issue further with FWS because it is a cognizant Federal agency.*

5. Comments Concerning Terrestrial Resource Issues

Comment: The Company [Dominion] has adopted policies that are compatible with protecting our natural resources. They work to protect all migratory birds with policies and procedures from the U.S. Department of Wildlife. (NAS-C-4)

Response: *The comment is noted. Terrestrial resources will be discussed in Chapter 2 of the SEIS. The comment supports North Anna Power Station, Units 1 and 2. The comment provides no new information and, therefore, will not be evaluated further.*

6. Comments Concerning Postulated Accident Issues

As stated in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, design basis accidents is the only Category 1 issue associated with postulated accidents. For severe accidents (i.e., beyond design basis accidents), the staff concluded that the probability-weighed environmental consequences from severe accidents are small for all plants, but that alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. See 10 CFR 51.53(c)(3)(ii)(L).

Comment: There are earthquake fault lines under the storage pools. What would happen if there were an earthquake and the pools leaked? (NAS-Z-11)

Comment: Any environmental study must include the possibilities of a substantial release of radioactivity due to: 3) earthquake greater than 6.5 on the Richter scale, and its effects, specifically on the storage pools which are on a known earthquake fault line; tornadoes. (NAS-Z-23)

Response: *The comments are noted. Severe accidents, including events initiated by earthquakes and tornadoes, were evaluated in the GEIS and the impacts were determined to be small for all plants. A site-specific analysis of Severe Accident Mitigation Alternatives for North Anna will be performed by the NRC staff within this environmental analysis. The comments provide no new information and will not be evaluated further in the context of the environmental review.*

7. **Comments Concerning Category 1 Uranium Fuel Cycle and Waste Management Issues**

As stated in 10 CFR Part 51, Table B-1, Category 1 uranium fuel cycle and waste management issues include:

- Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high-level waste)
- Offsite radiological impacts (collective effects)
- Offsite radiological impacts (spent fuel and high-level waste)
- Nonradiological impacts of the uranium fuel cycle
- Low-level waste storage and disposal
- Mixed waste storage and disposal
- Onsite spent fuel
- Nonradiolgical waste.

Comment: There is the issue of the high level nuclear waste that is generated through the process of irradiating the fuel, and at this point there is no known way to safely dispose of high-level nuclear waste. (NAS-H-5)

Comment: Just (operating) the North Anna Power Plant for the 20 years that's being proposed would result in an additional 400 metric tons of high level waste being added to the mix, the mix being already a mounting stockpile with no solution in sight. (NAS-H-6)

Comment: The issue of high-level waste needs to be looked at as a very severe environmental impact and at this point an unsolvable environmental impact of nuclear power. (NAS-H-15)

Comment: The county has an agreement with Virginia Power limiting how much storage space they can use on the dry cask, which could be a limiting factor in extending the life of the plant. So that's something that needs to be looked at. (NAS-R-3)

Comment: We need to talk about high and low level waste. The high level waste has not been moved, Yucca Mountain, or a storage place hasn't been done. The regional low-level waste compact is bankrupt, and we're sitting -- there are hundreds of tons of low-level waste sitting on the shores of Lake Anna. (NAS-R-9)

Comment: Further, each operating nuclear reactor generates about 20 metric tons of high-level nuclear waste annually. Relicensing North Anna would add 800 metric tons of waste to the nation's mounting waste stockpile, which already poses health, safety, and environmental concerns. (NAS-T-5)

Comment: That dump [Yucca Mountain in Nevada] would not be able to accommodate the additional volume of waste from relicensed reactors, such as North Anna. (NAS-T-6)

Comment: Dry cask storage has been the answer to the waste problem at the plant. That multiplies our exposure, and a 20-year extension on the license will only extend our possibilities for exposure. So this issue needs to be dealt with. (NAS-U-6)

Comment: I know the NRC cannot make policy on how to deal with radioactive spent fuel, but this is an issue that has been talked about and discussed and waffled back and forth for at least 25 years, and we still sit at the same position we did that many years ago with a very limited policy and no long-range plan. (NAS-U-7)

Comment: First and foremost are the issues of high and low level radioactive wastes. It is philosophically impossible to divorce the matters of waste from the operations of the plants or from the consideration of license renewal for extended operation. One cannot logically say that this matter is being taken care of in another venue when it clearly is not; in spite of repeated attempts by the NRC, the Congress, the nuclear industry, the DOE, the DOD, and others over many, many years, there is not, nor will there be in the near future, a permanent repository for the tons of high level wastes that are already stored and continue to be generated annually by this and other nuclear power plants. Because there currently is no approved off-site storage for the high level wastes, and even under the most optimistic forecasts of the NRC and utilities, these wastes will not be completely moved by either the original end date of the license, or even by the new end date (if the renewal is approved), the multiple matters of the storage of these wastes on site must be considered. Further, logic dictates that no renewal should even be considered unless and until the ultimate disposal has been approved and the facility(ies) open

and operational. To ignore this fundamental issue in this relicensing matter is a fundamental flaw in the process. (NAS-Z-1)

Comment: One must consider the low level wastes that are stored on site and continue to be generated. The Congressional mandate for the radioactive material generating states to band into regional compacts has been reduced to a shambles in the case of Virginia and the North Anna Power Station. There is no compact, no agreement, no plan. Barnwell has set a cut off date. Hundreds of tons of low-level waste sit next to Lake Anna (mostly in the form of the old discarded generators) without a reasonable expectation of how, where, or when they will be disposed of properly. (NAS-Z-2)

Comment: The County and VA Power have an agreement concerning the use of dry cask storage. The County may deny further pad construction. If there is no place to put the high level wastes, is it prudent to approve license renewal? How much space would it take to hold all the wastes if there is no permanent repository? Is there space available? Where? (NAS-Z-13)

Comment: With North Carolina dropping out, the Southeastern Compact is dead. Barnwell has put an end date on accepting out of state rad waste. Where will these wastes go? When? When will the generators be cut up and disposed? What would be the effect if a tornado hit the stored generators and threw them into the Lake? Is any low level waste now being disposed of in the local landfill? How much? What are the environmental effects? (NAS-Z-15)

Comment: There has been open discussion, in light of the federal government's failure to provide an environmentally safe permanent repository for the spent fuel, that the title of these high level wastes be given to the DOE and the DOE be responsible for the wastes on site. This matter must be seriously considered. The DOE has an unblemished record of failure in dealing with all matters nuclear. Every facility has serious environmental problems. Granting a license renewal to the utility, with the possibility of the DOE operating on site, is very, very, very risky. (NAS-Z-16)

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 have been evaluated by the NRC and, as set forth in the Waste Confidence Rule (10 CFR 51.23), 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 "Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS)," NUREG-1437 is based upon the assumption that storage of the spent fuel*

onsite is not permanent. The plant-specific supplement to the GEIS that will be prepared regarding license renewal for the North Anna Power Station, Units 1 and 2, will be based on the same assumption.

Likewise, the matter of processing and storage of low-level waste is considered a Category 1 issue. The conclusion regarding this issue in the GEIS included consideration of the long-term storage of low level waste on site during the license renewal term. The comments provide no new information and, therefore, will not be evaluated further.

Comment: We have the issue of MOX [mixed oxide fuel]. (NAS-G-5)

Comment: If MOX is used at the plant, the protocol of an accident changes, and we're set with hot spots on the core. (NAS-G-6)

Comment: Virginia Power has not signed out of the MOX agreement. While they've said they're not going to use it, they're in agreement with the DOE, and they haven't signed out of the agreement. They're still in it. (NAS-G-7)

Comment: We talked about MOX, that Virginia Power had flip-flopped on MOX, gone back and forth. It now says they don't want to use it, but a profile needs to be used if they're going to bring in weapons grade plutonium MOX and use it here at the plant. (NAS-R-4)

Comment: VA. Power had been asked at one of the annual meetings if they planned to use MOX fuel at North Anna. W.R. Matthews, then Station Manager and now Senior Vice-President, Nuclear Operations, wrote to the Board of Supervisors and to me, specifically stating that they would not use MOX. Within two years they reversed course and signed with the DOE, Duke and Cogema to participate in the US MOX program at North Anna. Subsequently they announced they were dropping the MOX program for North Anna. In a meeting of the dry cask committee, representatives of VA Power admitted to me and members of the Board of Supervisors that they only dropped the MOX program for public relations reasons in order to satisfy the public and regulators in Connecticut while they were buying Millstone Nuclear Power Plant. They have not ended their contractual agreement with the DOE yet. With a clear message that VA Power is untrustworthy on this specific issue, MOX must be considered in this license renewal. The releases in the event of any accident would be different if MOX were being used; storage issues, in both the pools and the dry casks, are different. The long term effects on the core, including hot spots and extra plutonium in the rods, must be considered. Without going into greater scientific detail (all of which is easily available), MOX considerably alters both operations and potential accidents. (NAS-Z-8)

Response: *The comments are noted. At the time the VEPCo application for North Anna license renewal was submitted, the licensee stated that MOX fuel was not going to be considered for North Anna. The licensee's withdrawal from the Department of Energy's Plutonium Disposition Project (the source of the MOX fuel) is documented in a letter to the NRC dated April 24, 2000. To date that position has not changed. However, even if VEPCo were to consider using MOX fuel in the future, any evaluation of the associated application would be an operational issue and not one for license renewal. If the North Anna licenses are renewed and a future application for the use of MOX fuel is received, the staff's review would consider the period of the renewed licenses. The comments provide no new information, and do not pertain to the scope of license renewal as set forth in 10 CFR Part 51 and Part 54 and will not be considered further.*

8. Comments Concerning Category 2 Socioeconomic Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 socioeconomic issues are:

- Housing
- Public services: public utilities
- Public services: education (refurbishment)
- Offsite land use (refurbishment)
- Offsite land use (license renewal term)
- Public services: transportation
- Historic and archaeological resources.

Comment: The biggest contribution that Dominion makes is in regard to our employment and tax base. (NAS-A-5)

Comment: Dominion is, by far, the largest employer in the county, employing over 900 people, and it contributes over $12 million a year in real property tax. (NAS-A-6)

Comment: North Anna Power Station is a good economic development partner. (NAS-B-1)

Comment: The financial benefits are extremely attractive to the county. (NAS-C-1)

Comment: The combined salaries reach almost $50 million, which contributes significantly to our local economy. (NAS-C-2)

Comment: They paid last year ten and a half million dollars to the County of Louisa, and since the inception, they have paid $160 million in taxes to the County of Louisa. (NAS-C-3)

Comment: North Anna desires to be a good corporate citizen, and they've proven to be one. (NAS-C-6)

Comment: This facility has had a tremendous economic benefit to the citizens of Orange County and its other surrounding counties. (NAS-D-2)

Comment: We have 300 of our employees that live in Louisa, and then we have almost 900 people who work at the plant, and then during outages, we bring another eight or 900 people in from other locations to work for up to a month at North Anna. (NAS-J-16)

Comment: All of the people [North Anna employees] live in the local community; support the local community and the restaurants here. (NAS-J-17)

Comment: Other site-specific issues that we [North Anna] looked at included socioeconomic impacts. We found positive contribution to the local infrastructure. (NAS-K-10)

Comment: This generation contributes to the economy of Virginia and the counties in which they operate. (NAS-M-6)

Comment: Fourthly, since 1966, Dominion Resources, North Anna Power Company, has paid approximately $160 million in property taxes to Louisa County. (NAS-M-7)

Comment: So the employees in the town that work at Dominion Power and the money that is made there that comes back through, and they get gas at the gas station, and they run by and get a loaf of bread on their way home. (NAS-N-2)

Comment: Through the availability of the tax base assessed on the North Anna Power Plant, the county has been available and able to provide services, which could only have been accomplished through double and triple taxation on the citizens that are already here without North Anna's help. (NAS-P-6)

Comment: The North Anna Power plant employs more than 825 people of which a large number consists of Louisa County citizens and town citizens, which in turn share their salaries with many of the businesses in the town and county. (NAS-P-7)

Comment: The biggest [way North Anna contributes], of course, is the tax dollars, over $10 million a year. (NAS-Q-2)

Comment: Dominion Power has 825 employees, I believe. About a third of those are from Louisa County. So a lot of our citizens work there and rely on that. (NAS-Q-4)

Comment: Just recently I had over 830 people at North Anna in addition to the normal workers. Those people all live in Louisa and in Mineral. They spend their money here. They spend time in the restaurants, hotels, food stores, and so forth, and they are part of the community. They may come and go, but they're part of the community for that short period of time. (NAS-W-3)

Comment: We [North Anna] looked at site specific issues including socioeconomic impacts. (NAS-X-11)

Comment: With regard to socioeconomic impacts, we [North Anna] found positive contribution to the local infrastructure. (NAS-X13)

Comment: Over 900 persons are employed at the station, making it one of the largest employers in the area. (NAS-AB-2)

Response: *The comments are noted. Socioeconomic issues specific to the plant are Category 2 issues and will be addressed in Chapter 4 of the SEIS. The comments support license renewal at the North Anna Power Station, Units 1 and 2.*

Comment: Many of the speakers praised VA Power for its positive economic effects on the community and the taxes paid. What would be the effect if the plant did not get a license renewal? How would the County budget be affected? What would happen to land and house values? On the same course, what would happen if there were an accident at the plant? What would happen to land and house values? How much insurance does VA Power have, and who and what would it cover? (NAS-Z-25)

Response: *Socioeconomic factors of license renewal are considered as a Category 2 issue in the GEIS and therefore are looked at site specifically and will be discussed in the plant-specific supplement to the GEIS for North Anna license renewal. No new information was provided by the comment. Therefore it will not be evaluated further.*

Comment: Other site-specific issues that we [North Anna] looked at included impacts on cultural resources. Because there will be no new construction activity, continued operation of the station means that the cultural resources impacts are also negligible. (NAS-K-12)

Comment: Other site-specific issues that we [North Anna] looked at included impacts on cultural resources. Because there will be no new construction activity, continued operation of the station means that the cultural resources impacts are also negligible. (NAS-X-12)

Response: *The comments are noted. Historic and archaeological resources are considered a Category 2 issue and will be discussed in Chapters 2 and 4 of the SEIS. The comment provides no new information and, therefore, will not be evaluated further.*

9. Comments Concerning Category 2 Aquatic Ecology Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 aquatic ecology issues are:

- Entrainment of fish and shellfish in early life stages
- Impingement of fish and shellfish
- Heat shock.

Comment: Page 4-6. The Service is concerned with impacts from entrainment of fish and shellfish in early life stages that occur at most power plants. In light of fish passage measures that may be prescribed to mitigate these impacts, this issue should be evaluated for the current and post restoration fish community. The report states, "Section 316(b) of the CWA requires that any standard established pursuant to Sections 301 or 306 of the CWA shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts (33 USC 1326). Entrainment through the condenser cooling system of fish and shellfish in the early life stages is one of the adverse environmental impacts that the best technology available minimizes. Virginia State Water Control Board regulations provide that compliance with a Virginia Pollutant Discharge Elimination System (VPDES) permit constitutes compliance with Sections 301 and 306 of the CWA (Ref. 4.2-1). In response to Board requirements, Dominion submitted a CWA Section 316(b) demonstration for NAPS in May 1985 (Ref. 4.2-2). Based on this and other input, the Board issued the NAPS VPDES Permit (Appendix B). Issuance of the NAPS VPDES permit indicates the Board's conclusion that NAPS, is operating in conformance with the permit, would be in compliance with the CWA requirements (Commonwealth of Virginia 2001). Dominion concludes that the Commonwealth regulation and the NAPS VPDES permit constitute the NAPS CWA 316(b) determination. Dominion also concludes that any environmental impact from entrainment of fish and shellfish in early life stages is small and does not require further mitigation." (NAS-AA-7)

Comment: Page 4-8. The Service agrees with the NRC that concludes that impingement of fish and shellfish is a significant issue. "NRC made impacts on fish and shellfish resources resulting from impingement a Category 2 issue because it could not assign a single significance level to the issue." The Service believes the impacts will likely require mitigation. The report states, "Impingement impacts are small at many plants, but might be moderate or large at other plants (Ref. 4.0-1, Chapter 4.2.2.1.3). Information to be ascertained includes: (1) type of cooling system (whether once-through or cooling pond), and (2) current CWA 316(b)

determination or equivalent state documentation. As Chapter 3.1.2 describes, NAPS has a once-through heat dissipation system. Chapter 4.2 discusses the CWA 316(b) demonstration for NAPS, indicating compliance with the use of best available technology. Chapter 2.5 also states that no federally- or state listed fish species have been collected in any monitoring studies, nor has any listed species been observed in creel surveys conducted by Dominion biologists and affiliated researchers. Based on the results of the CWA 316(b) Demonstration, Dominion concludes that this environmental impact is small. (NAS-AA-8).

Comment: Page 2-6. The Service is concerned with water quality and aquatic habitat impacts from thermal discharges, the canal systems, and the Waste Heat Treatment Facilities (Issues # 5, 18, & 44). The report described the conditions as, "Since its creation, Lake Anna has developed into a reservoir with three distinct ecological zones: Upper Lake, Mid-Lake, and Lower Lake. The Upper Lake is essentially riverine, shallow (average depth of 13 feet), and shows some evidence of stratification in summer. The Mid-Lake is deeper and stratifies in summer. It receives waters from Contrary Creek that, because of years of mining in its floodplain, are sometimes low in pH and high in metals. As noted earlier in this chapter, creation of Lake Anna has reduced the impacts of acid mine drainage on the North Anna River. The Lower Lake is deeper (average depth of 36 feet), clearer (with more light penetration), and shows pronounced annual patterns of winter mixing and summer stratification. The epilimnion (warm layer above the thermocline) was generally eight feet deep during pre-operational years, and 26 to 33 feet deep during operational years. The increase in depth of the epilimnion appears to be related to the heated discharge entering the reservoir from dike 3 (see Figure 3-2) and the withdrawal of cooler, deeper water at the NAPS intake (Ref. 2.2-3)." (NAS-AA-9)

Comment: Page 2-7. The VEPCo report continues to describe adverse thermal effect on aquatic organisms, "Results of Lake Anna temperature monitoring indicate that the shallower Upper Lake warms earlier in spring and reaches maximum temperature in summer sooner than the Lower Lake. The Lower Lake, with its greater depth and volume, warms more slowly in spring and retains its heat later in the year. It is estimated that the heat contributed by NAPS corresponds to about 10 percent of the solar heat that enters the reservoir on summer days (Ref. 2.2-3)". (NAS-AA-10)

Comment: Page 2-7. The Service would like to review the water temperature ranges from the report "Dominion's Environmental Policy & Compliance-Environmental Biology group submits annual reports to the Virginia Department of Environmental Quality on water temperatures and fisheries monitoring in Lake Anna and the Lower North Anna River." Specifically, the water temperature data from the month of August, 1983, when the mean water temperature was greater than 88°F. (NAS-AA-11)

Comment: Page 4-9. As the NRC states, the Service believes heat shock impacts are important and need to be mitigated to the fullest extent possible. The report states, "NRC made impacts on fish and shellfish resources resulting from heat shock a Category 2 issue, because of continuing concerns about thermal discharge effects and the possible need to modify thermal discharges in the future in response to changing environmental conditions (Ref. 4.0-1, Chapter 4.2.2.1.4). Information to be ascertained includes: (1) type of cooling system (whether once-through or cooling pond), and (2) evidence of a CWA Section 316(a) variance or equivalent state documentation. As Chapter 3.1.2 describes, NAPS has a once-through heat dissipation system. As discussed below, Dominion has a Section 316(a) variance for NAPS discharges. Section 316(a) of the CWA establishes a process whereby a thermal effluent discharger can demonstrate that thermal discharge limitations are more stringent than necessary and, using a variance, obtain alternative facility-specific thermal discharge limits (33 USC 1326). Dominion submitted a CWA Section 316(a) Demonstration for NAPS to the Virginia State Water Control Board on June 24,1986 (Ref. 4.4-1). The Fact Sheet (Item 22) accompanying the current NAPS VPDES permit (Appendix B) refers to this submittal, indicating that effluent limitations more stringent than the thermal limitations included in the permit are not necessary to assure the protection and propagation of a balanced indigenous community of shellfish, fish, and wildlife in Lake Anna and in the North Anna River downstream of the Lake. Based on the results of the CWA Section 316(a) Demonstration and the NAPS VPDES permit, Dominion concludes that this environmental impact is small and does not warrant further mitigation." (NAS-AA-12)

Comment: We [North Anna] also designed and constructed a series of three cooling lagoons totaling 3,400 surface acres, designated as the waste heat treatment facility. (NAS-K-2)

Comment: We [North Anna] conducted a study that looked at the impacts of this waste heat on the biota of Lake Anna. Using past information, coupled with new information, we found no long-term deleterious effects, and the Virginia State Water Control Board, which is now the Department of Environmental Quality, agreed with our findings. (NAS-K-7)

Comment: We [North Anna] studied water withdrawal issues, and again, we demonstrated no long-term deleterious effects on the lake, and the Water Board again concurred with our findings. (NAS-K-8)

Comment: In the mid-'80s, we conducted a study that looked at the impacts of this waste heat on the biota of Lake Anna. Using past information coupled with new information, we found no long-term deleterious effects, and the Virginia State Water Control Board, which is now called the Department of Environmental Quality, agreed with our findings. (NAS-X-8)

Comment: We [North Anna] looked at water withdrawal, which is the water that I mentioned earlier that is used for cooling, we did a study of the water withdrawal, and again, we demonstrated no long-term deleterious effects on the lake, and the Water Board, now DEQ, again, concurred with our findings. (NAS-X-9)

Response: *The comments are noted and relate to aquatic Category 2 issues. Aquatic ecology will be discussed in Chapter 2 and environmental impacts of operation will be discussed in Chapter 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further. The NRC will provide the information that FWS requested.*

10. Comments Concerning Category 2 Threatened and Endangered Species Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 threatened or endangered species issues are:

- Threatened or endangered species.

Comment: Page 2-16. The Service commends VEPCo for their description of Federal and State threatened and endangered species, and the company's efforts to initiate informal consultation on these issues. The report describes the conditions as, "Animal and plant species that are federally- or state-listed as endangered or threatened and that occur or could occur (based on habitat and known geographic range) in the vicinity of NAPS or along associated transmission lines are listed in Table 2-1. Bald eagles (*Haliaeetus leucocephalus*), state and federally classified as threatened, are occasionally observed along Lake Anna. The bald eagle forages along coasts, rivers, and large lakes. Dominion is not aware of any eagle nests at NAPS or along the transmission lines. Loggerhead shrikes (*Lanius ludovicianus*), state-classified as threatened, have been observed in the vicinity of NAPS. Loggerhead shrikes inhabit agricultural lands and other open areas. With the exception of the bald eagle and loggerhead shrike (*Lanius ludovicianus*), terrestrial species that are federally- and/or state-listed as endangered or threatened are not known to exist at NAPS or along the transmission lines. As of February 2000, there were no candidate federally threatened or endangered species that Dominion believes might occur at NAPS or along the transmission lines (Ref. 2.5-1)." (NAS-AA-13)

Comment: Page 2-17. The report states errors and gaps in the data regarding some fish and mussel species that need clarification. The report states, "No Federal-listed fish species' range includes the North Anna River and Lake Anna. One state-listed species, the emerald shiner (*Notropis atherinoides*), appears on a Final Environmental Statement list of fish collected in the North Anna River prior to its impoundment (Ref. 2.2-1, Appendix 2.14). However, according to several authoritative sources (Refs. 2.5-3, pp. 397-401, and 2.5-4, pp. 321-409), this species is

known only from the Clinch and Powell Rivers in the extreme western part of the state. It appears that the fish was misidentified. The emerald shiner is often confused with the closely related comely shiner (*Notropis amoenus*), which occurs throughout the York River drainage and has been documented from Lake Anna and the North Anna River (Ref. 2.5-3). The comely shiner was not listed in the Final Environmental Statement, but has been collected regularly by Dominion biologists in post-operational monitoring of the lower North Anna River (Ref. 2.2-8, Tables 4.2.2 and 4.2.3). The emerald shiner has not been collected in any of the post-operational surveys or monitoring studies. Based on the Virginia Department of Game & Inland Fisheries' Fish and Wildlife Information Service database, as many as two state- and Federal-listed freshwater mussel species could occur in streams in the vicinity of NAPS, or in streams crossed by NAPS transmission corridors (Table 2-1). It should be emphasized that neither of these species has actually been observed as occurring in streams in the vicinity of NAPS or in streams crossed by its transmission corridors." (NAS-AA-14)

Comment: Page 2-18. "None of these mussel species was collected in pre-impoundment surveys of the North Anna River, and none has been collected in more recent years by Dominion biologists conducting routine monitoring surveys. Three bivalve species were collected in the North Anna basin prior to impoundment: *Elliptio complanatus*, *Elliptio productus*, and *Sphaerium striatum* (Ref. 2.2-1, Appendix 2.13). None of these is a special-status species. In more recent years, the introduced Asiatic clam (*Corbicula fluminea*) has dominated collections from both Lake Anna and the lower North Anna River. Small numbers of Unionids (*Elliptio sp.*) and fingernail clams (*Sphaeriidae*) have also been collected. Acid drainage and sediment from the Contrary Creek mine site (see Chapter 2.2 discussion) historically depressed mussel populations downstream from the Contrary Creek-North Anna River confluence but, in the 1980s, there were indications that mussel populations (*Elliptio sp.*) were recovering in the lower North Anna River (Ref. 2.2-3, Chapter 6.2)." (NAS-AA-15)

Response: *The staff acknowledges the comments. The appropriate descriptive information regarding the plant-specific ecology and threatened or endangered species of the site will be addressed in Chapters 2 and 4 of the SEIS.*

Comment: The evaluation of threatened and endangered species was a little different in that we [North Anna] had to go to state and Federal agencies to investigate possible impacts on listed species. The research showed no impact to any threatened or endangered species as a result of the operation of North Anna Power Station and its associated transmission lines. (NAS-K-9)

Comment: The evaluation of threatened and endangered species was a little different in that we had to go to state and Federal agencies to investigate possible impacts on listed species.

The research showed no impact to any threatened or endangered species as a result of the operation of North Anna and its associated transmission lines. (NAS-X-10)

Response: *The comments are noted. The comments acknowledge the importance of the manner in which North Anna Power Station operates the site to the benefit of threatened and endangered species. The appropriate descriptive information regarding the plant-specific ecology of the site will be addressed in Chapter 2 of the SEIS.*

Part II - Comments Received on the Draft SEIS

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding North Anna Power Station, Units 1 and 2, Draft Report for Comment* (NUREG-1437, Supplement 7, referred to as the draft SEIS) to Federal, State, and local government agencies as well as interested members of the public, requesting comments by August 1, 2002. 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, the Alderman Library at the University of Virginia in Charlottesville, Virginia, and the Louisa County Public Library in Mineral, Virginia

- 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 and opportunity for comment in the Federal Register on May 16, 2002 (67 FR 34960)

- issued public announcements, such as advertisements in local newspapers and postings in public places, of the availability of the draft SEIS

- announced and held two public meetings in Louisa, Virginia, on June 25, 2002, to describe the results of the environmental review and answer related questions

- 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.

During the comment period, the staff received a total of 4 comment letters in addition to the comments received during the public meetings.

The staff has reviewed the public meeting transcripts and the 4 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. Appendix A, Part II, Section A.1 contains a summary of the comments and the staff's responses. Related issues are grouped together. Appendix A, Part II, Section A.2 contains excerpts of the June 25, 2002, public meeting transcripts, the written statements provided at the public meetings, and the 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. 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 letters "NAD" 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) and written comment letters are also identified by the letters "NAD."

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 North Anna Power Station, Units 1 and 2) 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 safety considerations reviewed under 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 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] or information that required further evaluation on Category 2 issues [(4)(a)]. Therefore, the GEIS and draft SEIS remained valid and bounding, and no further evaluation was performed.

Comments without a supporting technical basis or without 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 Part II of this appendix (A.1.1 through A.1.18), 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. Comment Log

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
NAD-A-1	J Wright	Afternoon Meeting Transcript (06/25/02)	A-48	A 1.14
NAD-A-2	J Wright	Afternoon Meeting Transcript (06/25/02)	A-40	A 1.11
NAD-A-3	J Wright	Afternoon Meeting Transcript (06/25/02)	A-48	A 1.14
NAD-A-4	J Wright	Afternoon Meeting Transcript (06/25/02)	A-32	A 1.3
NAD-A-5	J. Wright	Afternoon Meeting Transcript (06/25/02)	A-52	A 1.18
NAD-A-6	J. Wright	Afternoon Meeting Transcript (06/25/02)	A-32	A 1.3
NAD-B-1	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-32	A 1 3
NAD-B-2	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-32	A 1 3
NAD-B-3	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-40	A 1.11
NAD-B-4	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-52	A 1.18
NAD-B-5	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-52	A 1 18
NAD-B-6	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-32	A 1 3
NAD-B-7	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-52	A 1 18
NAD-B-8	M Lowe	Afternoon Meeting Transcript (06/25/02)	A-52	A.1 18
NAD-C-1	D. Green	Afternoon Meeting Transcript (06/25/02)	A-32	A.1 3
NAD-C-2	D. Green	Afternoon Meeting Transcript (06/25/02)	A-48	A.1 14
NAD-C-3	D. Green	Afternoon Meeting Transcript (06/25/02)	A-32	A.1 3
NAD-C-4	D. Green	Afternoon Meeting Transcript (06/25/02)	A-49	A 1 14
NAD-D-1	J Davis	Afternoon Meeting Transcript (06/25/02)	A-49	A 1 14
NAD-D-2	J Davis	Afternoon Meeting Transcript (06/25/02)	A-56	A 1.18
NAD-D-3	J Davis	Afternoon Meeting Transcript (06/25/02)	A-49	A 1.14
NAD-D-4	J Davis	Afternoon Meeting Transcript (06/25/02)	A-52	A 1.18
NAD-D-5	J Davis	Afternoon Meeting Transcript (06/25/02)	A-36	A 1.7
NAD-D-6	J. Davis	Afternoon Meeting Transcript (06/25/02)	A-32	A 1.3
NAD-D-7	J. Davis	Afternoon Meeting Transcript (06/25/02)	A-40	A 1.11
NAD-D-8	J. Davis	Afternoon Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-D-9	J Davis	Afternoon Meeting Transcript (06/25/02)	A-49	A 1 14

Table A-2. (contd)

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
NAD-D-10	J. Davis	Afternoon Meeting Transcript (06/25/02)	A-33	A.1.3
NAD-E-1	J. White	Afternoon Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-E-2	J. White	Afternoon Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-E-3	J. White	Afternoon Meeting Transcript (06/25/02)	A-36	A 1.7
NAD-E-4	J. White	Afternoon Meeting Transcript (06/25/02)	A-33	A.1.3
NAD-F-1	J. Kogle	Afternoon Meeting Transcript (06/25/02)	A-33	A.1.3
NAD-G-1	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-33	A.1.3
NAD-G-2	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-54	A.1.18
NAD-G-3	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-37	A.1.9
NAD-G-4	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-37	A.1.8
NAD-G-5	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-37	A.1 8
NAD-G-6	B. Murphy	Afternoon Meeting Transcript (06/25/02)	A-31	A.1.1
NAD-H-1	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-38	A.1.10
NAD-H-2	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-41	A.1.12
NAD-H-3	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-49	A.1.15
NAD-H-4	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-56	A.1.19
NAD-H-5	J Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-56	A.1.19
NAD-H-6	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-36	A.1.7
NAD-H-7	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-38	A 1.10
NAD-H-8	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-36	A 1.6
NAD-H-9	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-50	A.1.15
NAD-H-10	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-43	A 1.12
NAD-H-11	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-55	A.1.18
NAD-H-12	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-50	A.1.17
NAD-H-13	J Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-56	A 1.18
NAD-H-14	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-51	A.1.17
NAD-H-15	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-51	A 1.17
NAD-H-16	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-42	A.1.12
NAD-H-17	J Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-42	A.1.12
NAD-H-18	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-54	A 1.18
NAD-H-19	J. Rosenthal	Afternoon Meeting Transcript (06/25/02)	A-41	A 1.12
NAD-I-2	M. Cobb	Evening Meeting Transcript (06/25/02)	A-52	A 1.17
NAD-I-3	M. Cobb	Evening Meeting Transcript (06/25/02)	A-34	A 1.4
NAD-I-4	M. Cobb	Evening Meeting Transcript (06/25/02)	A-41	A 1.12
NAD-I-5	M. Cobb	Evening Meeting Transcript (06/25/02)	A-34	A 1.4
NAD-I-6	M. Cobb	Evening Meeting Transcript (06/25/02)	A-35	A.1.4
NAD-I-7	M. Cobb	Evening Meeting Transcript (06/25/02)	A-35	A.1.5
NAD-I-8	M. Cobb	Evening Meeting Transcript (06/25/02)	A-35	A 1.5
NAD-I-9	M. Cobb	Evening Meeting Transcript (06/25/02)	A-55	A.1.18
NAD-I-10	M. Cobb	Evening Meeting Transcript (06/25/02)	A-55	A.1.18
NAD-I-11	M. Cobb	Evening Meeting Transcript (06/25/02)	A-42	A 1.12
NAD-J-2	G. Root	Evening Meeting Transcript (06/25/02)	A-36	A.1.7
NAD-J-3	G Root	Evening Meeting Transcript (06/25/02)	A-39	A 1.10
NAD-J-4	G. Root	Evening Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-K-3	A Dellorco	Evening Meeting Transcript (06/25/02)	A-42	A 1.12
NAD-K-4	A Dellorco	Evening Meeting Transcript (06/25/02)	A-49	A 1.14
NAD-K-5	A Dellorco	Evening Meeting Transcript (06/25/02)	A-51	A.1.17
NAD-K-6	A Dellorco	Evening Meeting Transcript (06/25/02)	A-50	A 1.16

Table A-2. (contd)

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
NAD-M-1	F. Barnes	Evening Meeting Transcript (06/25/02)	A-40	A 1 11
NAD-M-2	F. Barnes	Evening Meeting Transcript (06/25/02)	A-40	A 1.11
NAD-M-3	F Barnes	Evening Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-M-4	F Barnes	Evening Meeting Transcript (06/25/02)	A-49	A 1.14
NAD-M-5	F Barnes	Evening Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-N-1	D. Morgan	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-N-2	D. Morgan	Evening Meeting Transcript (06/25/02)	A-53	A.1 18
NAD-O-1	B Beasley	Evening Meeting Transcript (06/25/02)	A-40	A.1 11
NAD-O-2	B Beasley	Evening Meeting Transcript (06/25/02)	A-33	A 1 3
NAD-P-1	M Schlemmen	Evening Meeting Transcript (06/25/02)	A-53	A.1.18
NAD-P-2	M Schlemmen	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-P-3	M Schlemmen	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-P-4	M Schlemmen	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-P-5	M Schlemmen	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-Q-1	J. Davis	Evening Meeting Transcript (06/25/02)	A-49	A 1.14
NAD-Q-2	J. Davis	Evening Meeting Transcript (06/25/02)	A-56	A 1 18
NAD-Q-3	J Davis	Evening Meeting Transcript (06/25/02)	A-49	A.1.14
NAD-Q-4	J Davis	Evening Meeting Transcript (06/25/02)	A-52	A.1 18
NAD-Q-5	J Davis	Evening Meeting Transcript (06/25/02)	A-36	A.1 7
NAD-Q-6	J Davis	Evening Meeting Transcript (06/25/02)	A-32	A 1 3
NAD-Q-7	J Davis	Evening Meeting Transcript (06/25/02)	A-40	A 1 11
NAD-Q-8	J Davis	Evening Meeting Transcript (06/25/02)	A-53	A 1.18
NAD-Q-9	J Davis	Evening Meeting Transcript (06/25/02)	A-49	A 1.14
NAD-Q-10	J Davis	Evening Meeting Transcript (06/25/02)	A-33	A 1.3
NAD-R-1	J White	Evening Meeting Transcript (06/25/02)	A-33	A 1 3
NAD-R-2	J White	Evening Meeting Transcript (06/25/02)	A-33	A.1 3
NAD-R-3	J. White	Evening Meeting Transcript (06/25/02)	A-36	A.1 7
NAD-R-4	J. White	Evening Meeting Transcript (06/25/02)	A-33	A.1 3
NAD-S-1	I Dusinberre	Evening Meeting Transcript (06/25/02)	A-55	A.1 18
NAD-S-2	I Dusinberre	Evening Meeting Transcript (06/25/02)	A-35	A.1 4
NAD-T-1	D Clark	Evening Meeting Transcript (06/25/02)	A-34	A 1 3
NAD-T-2	D Clark	Evening Meeting Transcript (06/25/02)	A-54	A 1.18
NAD-U-1	D Schwartz	Email (07/27/02)	A-35	A 1.4
NAD-U-2	D Schwartz	Email (07/27/02)	A-31	A 1 2
NAD-U-3	D Schwartz	Email (07/27/02)	A-52	A 1.17
NAD-V-1	L. Hartz	Letter (07/30/02)	A-56	A 1 19
NAD-V-2	L. Hartz	Letter (07/30/02)	A-57	A 1.19
NAD-V-3	L. Hartz	Letter (07/30/02)	A-57	A 1 19
NAD-V-4	L. Hartz	Letter (07/30/02)	A-57	A.1 19
NAD-V-5	L. Hartz	Letter (07/30/02)	A-57	A.1 19
NAD-V-6	L. Hartz	Letter (07/30/02)	A-57	A.1 19
NAD-V-7	L. Hartz	Letter (07/30/02)	A-57	A.1 19
NAD-V-8	L Hartz	Letter (07/30/02)	A-58	A 1.19
NAD-V-9	L Hartz	Letter (07/30/02)	A-58	A 1.19
NAD-V-10	L Hartz	Letter (07/30/02)	A-58	A 1.19
NAD-V-11	L Hartz	Letter (07/30/02)	A-58	A 1.19
NAD-V-12	L Hartz	Letter (07/30/02)	A-58	A 1.19

Table A-2. (contd)

No.	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
NAD-V-13	L. Hartz	Letter (07/30/02)	A-58	A 1.19
NAD-V-14	L Hartz	Letter (07/30/02)	A-58	A.1.19
NAD-V-15	L. Hartz	Letter (07/30/02)	A-58	A.1.19
NAD-V-16	L. Hartz	Letter (07/30/02)	A-59	A.1.19
NAD-V-17	L. Hartz	Letter (07/30/02)	A-59	A.1.19
NAD-W-1	M Chezik	Letter (07/24/02)	A-37	A.1.9
NAD-W-2	M. Chezik	Letter (07/24/02)	A-45	A.1.13
NAD-W-3	M. Chezik	Letter (07/24/02)	A-38	A.1.9
NAD-W-4	M. Chezik	Letter (07/24/02)	A-46	A 1.13
NAD-W-5	M. Chezik	Letter (07/24/02)	A-47	A.1.13
NAD-W-6	M. Chezik	Letter (07/24/02)	A-47	A 1.13
NAD-W-7	M. Chezik	Letter (07/24/02)	A-48	A.1.13
NAD-W-8	M. Chezik	Letter (07/24/02)	A-47	A 1.13
NAD-Y-1	G. Morrison	Letter (06/25/02)	A-34	A 1.3
NAD-Y-2	G. Morrison	Letter (06/25/02)	A-49	A.1.14
NAD-Y-3	G Morrison	Letter (06/25/02)	A-49	A 1.14
NAD-Y-4	G Morrison	Letter (06/25/02)	A-34	A 1.3
NAD-Y-5	G Morrison	Letter (06/25/02)	A-54	A 1.18
NAD-Y-6	G. Morrison	Letter (06/25/02)	A-56	A 1.18
NAD-Y-7	G Morrison	Letter (06/25/02)	A-34	A 1.3

(a) This comment was determined upon later review to either be combined with another comment or to be un-related to the scope of the SEIS.

A.1 Comments and Responses

A.1.1 General Comments in Support of the License Renewal Process

Comment: We are in favor of renewing the license, and thanks for the statement. (NAD-G-6)

Response: *The comment is noted. The comment is supportive of license renewal and its processes, and is general in nature. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.2 General Comments in Opposition of the License Renewal Process

Comment: We need to phase out all nuclear power plants because it is highly irresponsible for our generation to create the nuclear waste that generations thousands of years to come will have to continue to monitor long after our civilization has died out. This is playing God on a grand scale in an area where we have no business treading. Nuclear power is ethically

untenable and morally reprehensible. We needed to have the technology for handling nuclear waste perfected decades ago, before the first plant was ever built. (NAD-U-2)

Response: *The comment is noted. The comment opposes license renewal and its processes, and does not provide new information. This comment is not within the scope of 10 CFR Part 51 for the environmental review associated with the application for license renewal at North Anna Power Station, Units 1 and 2. Therefore, this comment will not be evaluated further.*

A.1.3 General Comments in Support of License Renewal at North Anna Power Station, Units 1 and 2

Comment: It is a well managed corporation. They've shown signs of this in so many ways, in the nine years that I have lived here, which is a key to any kind of good operation. (NAD-A-4)

Comment: We want them to continue as a part of Louisa County for many years to come. (NAD-A-6)

Comment: And I have to say that I'm extremely impressed here, not only by the quality of people, and the quality of programs that they have, but the attitude in general. I think that they are very concerned about this county, and the safety and welfare of this county. (NAD-B-1)

Comment: And they are also good corporate neighbors for us. The things that they do for our county in terms of support to the county itself. (NAD-B-2)

Comment: And I feel very safe, and very happy, and I tell you, it is a pleasure to not only work with these people, but associate with them, and have them be a part of the community here. (NAD-B-6)

Comment: We hold numerous drills of all kinds in cooperation with NAPS, and we make numerous visits to the plant for training, and information. As an outsider I'm convinced that the North Anna Power Station is an excellently run plant with highly trained professionals in charge. (NAD-C-1)

Comment: I have nothing but praise for this Dominion/Virginia Power operation. Its open communication, and its safety conscious employees. (NAD-C-3)

Comment: We strive to be a good corporate citizen, and have enjoyed the professional supportive working relationship that we have with the county, and the other local communities surrounding the station. (NAD-D-6) (NAD-Q-6)

Comment: In preparing North Anna's relicensing application more than 50 individuals have spent, literally, thousands of hours reviewing all environmental aspects of continued plant operation. The report concluded that continued operation of North Anna Power Station beyond 40 years will not negatively impact the environmental surrounding of the plant. (NAD-D-10) (NAD-Q-10)

Comment: The impact statement is a thorough, in my opinion, and accurate scientific assessment of the potential environmental impacts associated with the proposed action. (NAD-E-1) (NAD-R-1)

Comment: We support and agree with the conclusions of the NRC Staff that renewing the North Anna Power Station operating license is a reasonable action that will not result in any noticeable impact to the environment. (NAD-E-2) (NAD-R-2)

Comment: As a result of that process no new information was identified, but we did go through the process, as it was important to do. This activity is considered very important, in my opinion, in all license renewal projects for verification of the findings in the Generic Environmental Impact Statement. (NAD-E-4) (NAD-R-4)

Comment: And I must say our experience with Virginia Power has been nothing but absolutely terrific. They have been wonderful neighbors, very sensitive to the environment, sensitive to recreational issues. And we certainly support, very much, the relicensing effort of the power plant. (NAD-F-1)

Comment: First thing is I'm in favor of renewing the license for North Anna. I think it is a safe operation, I think it is a benefit to the population as a whole, and Louisa County in particular. (NAD-G-1)

Comment: I personally would favor relicensing for an additional 20 years. (NAD-J-4)

Comment: Most of all is the openness that Virginia Power has brought. If something happens, as an elected official, I get a phone call. I don't read it in the paper first. Somebody from Virginia Power makes sure that we know first-hand anything that we need to know. (NAD-M-3)

Comment: So without a doubt, I'm in support of Virginia Power. I'm in support of the application. And if my two cents count, I would like for them to count, and I'm in support of Virginia Power's application. (NAD-M-5)

Comment: Basically lots of changes taking place in the last 34 years, a very positive impact on our community, our town. We've enjoyed the past 34, and we hope there is another, at least

34. And at that time I hope there is someone here, standing, that says we have had 68, and we want 68 more. It has been very positive. (NAD-O-2)

Comment: And the bottom line is, ..., but I strongly recommend it. I mean, I reviewed this, the environmental statement, I reviewed the procedure. (NAD-T-1)

Comment: Throughout Dominion Virginia Power's twenty year history in Central Virginia they have proven themselves good corporate citizens — financially as well as environmentally. (NAD-Y-1)

Comment: North Anna Power Station commitment to the environment is above reproach. Nuclear energy itself does not produce any of the air emissions associated with fossil-fueled generation plants, thus nuclear generation helps to protect the environment. The company's conservation efforts focus on protecting and enhancing fish populations as well as migratory birds through policies, procedures and permits obtained from the United States Fish and Wildlife Service. As good stewards to the environment Dominion biologists regularly monitor the health of fish populations with no harmful results found. As I perceive it, North Anna Nuclear Power Station is environmentally safe, environmental sound and environmentally responsible. (NAD-Y-4)

Comment: For nine consecutive years North Anna Power Station has been recognized as among the lowest-cost producers of nuclear generated electricity in the United States. The North Anna station plays a crucial role in providing low-cost energy that makes Virginia attractive to business. The continued operation of North Anna Power Station is critical to the development of a robust, competitive retail electric market in Virginia. (NAD-Y-7)

Response: *The comments are noted. The comments are supportive of license renewal at North Anna Power Station, Units 1 and 2, and are general in nature. The comments provide no new information; therefore, will not be evaluated further.*

A.1.4 General Comments in Opposition of License Renewal at North Anna Power Station, Units 1 and 2

Comment: If we had given the supports, the financial incentives to alternative energy that we've given to the nuclear industry, we would not be currently living with the threats that, for instance, the nuclear waste disposal brings, effectively to our doorstep if the North Anna plant is going to be transporting toxic waste. (NAD-I-3)

Comment: We have good schools, we have good roads. This is a terrible choice for our Board of Supervisors, and other public servants, because they see the benefits of this money, they

see the benefits of the philanthropy that the power plant employees have given to the county, and to our children. (NAD-I-5)

Comment: Nevertheless, as a concerned citizen I look at the larger picture, I believe, and see that the threat continues to exist. I think , as I already stated, that if we put the monies that we put into nuclear energy into alternative energy, we would not have to live with this threat. (NAD-I-6)

Comment: North Anna has been a fantastic provider of safety. But what if we put the thousands of hours that you put in, what if we put it into alternative sources? If we give a thought to something different, wouldn't we have a beautiful future? (NAD-S-2)

Comment: I disapprove of the relicensing of the North Anna nuclear plant when the current license expires. (NAD-U-1)

Response: *The comments are noted. The comments opposing license renewal at North Anna Power Station, Units 1 and 2, are general in nature, and do not provide new information. These comments are not within the scope of 10 CFR Part 51 for the environmental review associated with the application for license renewal at North Anna Power Station, Units 1 and 2. Therefore, these comments will not be evaluated further in the SEIS.*

A.1.5 Comments Concerning Decommissioning Issues

Comment: The cost of nuclear power is borne by taxpayers in general, as well as by rate payers. The nuclear waste costs are insufficient to be covered by funds set aside for disposal and decommissioning of plants. More waste, another 20 years, or however many years, means more taxes, perhaps hidden taxes. (NAD-I-7)

Response: *NRC regulation (10 CFR 50.75) requires the establishment of a decommissioning trust fund. Sufficient funds are required to be collected and placed in a secure trust that would assure decommissioning, including the disposal of low-level waste. Funds are also collected from licensees annually to defray costs associated with the ultimate disposal of high-level waste.*

Comment: There are taxes going to support the plants, and to support the decommissioning, enormous amounts of money. Nuclear energy is not economical. (NAD-I-8)

Response: *The comment is noted. The comment provides no new information, therefore it will not be evaluated further. There were no changes to the SEIS text.*

A.1.6 Comments Concerning Surface Water Quality, Hydrology, and Use Issues

Comment: On [page] 4-40 Virginia Dominion Power is building a new building at the plant site, which is going to affect water use and quality, as well as discharge. That information is not included in here. This new building was just announced this month. (NAD-H-8)

Response: *The comment is noted. The construction of a new building on the site at this time is for current operation and, therefore, is not related to license renewal. This comment is not within the scope of 10 CFR Part 51 for the environmental review associated with the application for license renewal at North Anna Power Station, Units 1 and 2. Therefore, this comment will not be evaluated further.*

A.1.7 Comments Concerning Category 1 Aquatic Resource Issues

Comment: We also have a conservation effort that focuses on protecting and enhancing fish populations in the lake. Special structures of brush and cinder blocks were constructed and sunk in the lake to improve the fish habitat. Our biologists regularly sample, or monitor the health of the fish population. And that data is compared with data that was taken prior to our first day of operation. These comparisons have consistently shown that North Anna Power Station is not harming the lake's fish population. (NAD-D-5) (NAD-Q-5)

Comment: Based on the review of all of the historical information, including the annual monitoring, which does continue today, the NRC concluded that potential impacts to aquatic organisms are small, and that additional mitigation is not warranted, and we do agree with that finding. (NAD-E-3) (NAD-R-3)

Comment: There was concern on the cooling ponds about the fish. And that slightly higher temperatures would have very adverse effects on them. Well, after 30 years of operation we now have facts. And I hope that they go into this environmental impact statement in a factual way. (NAD-J-2)

Response: *The comments are noted. Aquatic ecology is discussed in Chapter 2 and Chapter 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.*

Comment: In [page] 4-4, they say thermal stratification to the lake is not a problem, but on [page] 4-16 it is noted in the thing as pronounced in the lake. I'm not sure how you can either have it pronounced and not a problem, or maybe stratification is not a problem. (NAD-H-6)

Response: *The comment is noted. Thermal stratification is a naturally-occurring process that commonly occurs in temperate lakes and reservoirs. The stratification results from the heating of the surface of the lake from the sun during the summer months. It is particularly pronounced in shallow, man-made reservoirs such as Lake Anna. This naturally-occurring thermal stratification was documented for Lake Anna in pre-operational studies (i.e. prior to the operation of the North Anna power station and any release of cooling water into Lake Anna). It was this naturally-occurring thermal stratification that was described as "pronounced" on page 4-16 of the draft SEIS. Page 4-4 of the draft SEIS refers to "altered thermal stratification of lakes" resulting from the operation of nuclear power plants, which is not expected to be a problem during the license renewal term. Data for Lake Anna, described in section 4.1.3. has shown that the naturally-occurring thermal stratification of Lake Anna has not been significantly altered by the release of cooling water from North Anna, Units 1 and 2. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.8 Comments Concerning Terrestrial Resource Issues

Comment: The second part of the environment is the warm blooded part, and that is there is estimated that there are about 500 beavers around the lake. That population has remained constant over the past 20 years. (NAD-G-4)

Comment: We have seen fresh water otters, muskrats there as well. And so I would go to the other side and say that the existence of the plant is actually a benefit to the habitat of the wildlife, and has increased the wildlife around in this area. (NAD-G-5)

Response: *The comments are noted. Terrestrial ecology is discussed in Chapter 2 of the SEIS. The comments support North Anna Power Station, Units 1 and 2. The comments provide no new information and, therefore, will not be evaluated further.*

A.1.9 Comments Concerning Threatened and Endangered Specie Issues

Comment: Third is actually the plant is a benefit to the environment. Mr. Green hasn't seen any eagles, but we have certainly seen them. There are a couple that fish on Contrary Creek, there is one that fishes right across from us at the State park. (NAD-G-3)

Response: *The comment is noted. Threatened and endangered species are discussed in Chapter 2 and Chapter 4 of the SEIS. The comment provides no new information and, therefore, will not be evaluated further.*

Comment: The FWS has determined that the North Anna operations and minor refurbishment may have potential to adversely affect area natural resources. The federally threatened bald

eagle, *Haliaeetus leucocephalus*, does not appear to be affected, but a scientific approach should be maintained to evaluate and document any mortalities. Similar records for other migratory bird impacts should be maintained and any mortality reported to the FWS. (NAD-W-1)

Comment: The FWS agrees that the potential is low for the North Anna Power Station to adversely affect the bald eagle, a federally threatened species. Our primary concern is for the incidental mortality to migratory birds associated with the transmission lines. In the event of migratory bird mortality, Virginia Electric and Power Company should complete a Raptor Incident Report for the FWS and the appropriate state agencies. (NAD-W-3)

Response: *The comments are noted. NRC understands FWS' concerns regarding protection of bald eagles. With regard to impacts from plant operations, however, the bald eagle does not appear to be affected by the proposed action and as long as operations at the North Anna Power Station, Units 1 and 2, continue to comply with the Bald Eagle Protection Guidelines of Virginia (prepared in consultation with and approved by FWS), any effects on bald eagles will not adversely impact the bald eagle population. In addition, VEPCo has a program that requires submission of an incident report when raptor injuries or mortalities occur as a result of collision with the North Anna Power Station transmission lines. Therefore, the NRC has determined that no further evaluation is needed with regard to operations at North Anna Power Station, Units 1 and 2.*

A.1.10 Comments Concerning Category 1 Human Health

Comment: On page 2-10 it says: There is not going to be increased liquid waste releases in the next 20 years. The question with all the releases, and the stuff, the gaseous, the liquid, or the solid waste, is we are talking about comparative versus cumulative. (NAD-H-1)

Response: *The comment is noted. The statement on page 2-10 refers to the annual effluent release rates. Annual effluent releases are not expected to increase during the license renewal term. The text has been modified to make this clear. The comment provides no new information; therefore, the comment will not be evaluated further.*

Comment: On [page] 4-24, long term effects of exposure to low level radiation has not been studied, we don't have information. What are the effects for 30 years? So we are having a hard problem to know how these effects could be judged or estimated. (NAD-H-7)

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 are based on the recommendations of standards-setting organizations. Radiation standards reflect extensive*

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 of 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.

The comment provides no new information and, therefore, will not be evaluated further.

Comment: How many people have died in the United States as a result of radiation from nuclear production? (NAD-J-3)

Response: *The comment is noted. In most cases, it is not possible to determine the cause of fatal cancers. Latent cancer estimates related to nuclear power are based on dose estimates calculated by conservative models and cancer risk factors. The cancer risk factors used in this calculation are also quite conservative. They are from the BEIR-V report, "Health Effects of Exposure to Low Levels of Ionizing Radiation[a]." In this report it is estimated that, "[i]f 100,000 persons of all ages received a whole body dose of 0.1 Gy (10 rad) of gamma radiation in a single brief exposure, about 800 extra cancer deaths would be expected to occur during their remaining lifetimes in addition to the nearly 20,000 cancer deaths that would occur in the absence of radiation. Because the extra cancer deaths would be indistinguishable from those that occurred naturally, even to obtain a measure of how many extra deaths occurred is a difficult statistical estimation problem."*

Regarding health effects to populations around nuclear power plants, NRC relies on the studies performed by the National Cancer Institute (NCI). NCI conducted a study in 1990, "Cancer in Populations Living Near Nuclear Facilities," to look at cancer mortality rates around 52 nuclear power plants, nine Department of Energy (DOE) facilities, and one former commercial fuel reprocessing facility. The NCI study concluded from the evidence available that there is no suggestion that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancers in populations living nearby. Additionally, the American Cancer Society had

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[a] Prepared by the National Research Council, National Academy Press, Washington, D.C., 1990.

concluded that although reports about cancer case clusters in such communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do elsewhere in the population.

The comment provides no new information and, therefore, will not be evaluated further. There was no change to the SEIS text.

A.1.11 Comments Concerning Category 1 Socioeconomic Issues

Comment: There are volunteer projects in which the employees have participated, and these are many things that they have done for the county, and assisted us with. (NAD-A-2)

Comment: And I think you can look at that, over the last couple of weeks, it is just simply by the volunteers that were walking up and down the streets here, in the county, picking up bags and bags of litter, that were on the side of the road, these are volunteers. (NAD-B-3)

Comment: Dominion has a long-standing tradition of investing in the communities it serves through volunteer and philanthropic activities. Many of our employees demonstrate their commitment to the community by participating in programs such as Adopt a Highway, Thanksgiving Baskets for the Needy, blood drives, supporting the area Boy Scouts, and many other community activities. (NAD-D-7) (NAD-Q-7)

Comment: Their employees, without a doubt, the volunteer hours that they put in this community, is not duplicated at all by anybody. We had a playground, a park that we tried to get up and running, and their volunteer staff went over there, and their employees went over there and made it a reality where kids could go over there and have an opportunity. (NAD-M-1)

Comment: The library, they contributed funds, and things of that nature, in the community. From an education standpoint, being a rural county we would not enjoy the things that we enjoy from an educational standpoint, without Virginia Power. (NAD-M-2)

Comment: The people at the power plant, the employees there, have set a tremendous standard for us to follow, as far as involvement in the community, their volunteerism. I recall the first place I was aware of that was the elementary schools had science fairs. They always had folks from the power plant to act as judges in the appropriate areas, and they are very positive, and very significant impact there, brought the image up for our science fair participation. (NAD-O-1)

Response: *The comments are noted. The comments are supportive of license renewal at the North Anna Power Station, Units 1 and 2. Public services were evaluated in the GEIS and*

determined to be a Category 1 issue. Information regarding the impact on education is discussed in Chapter 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.

A.1.12 Comments Concerning Category 1 Uranium Fuel Cycle and Waste Management

Comment: On [page] 2-12, the low level compact for radiological waste, is non-operational. Barnwell promises to close to outside, people from outside South Carolina. The low level waste is currently stored on-site, including two generators, with no plans to be cut and removed. There are significant problems with storage, disposal, and accumulation of low level solid waste, radioactive. (NAD-H-2)

Comment: The pads are limited. Louisa County has the right to limit storage of waste on those pads. That was part of the conditional use permit. If the county limits the waste storage on the pads, what are the effects, where are they going to put the waste? If we are opening for 20 more years, and the county doesn't allow it, where is that waste going to be? If they don't allow it there, they are going to have to have another one, and there is going to be an environmental impact. (NAD-H-19)

Comment: Where else do we want this toxic waste to sit, as it is at North Anna, in the caskets, casks I should say, but maybe caskets is more appropriate, and be subject to the effects of weather, the effects of time, it is a sitting time bomb, in my estimation. (NAD-I-4)

Response: *The comments are noted. 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, as set forth in the Waste Confidence Rule (10 CFR 51.23). In the Waste Confidence Rule, the Commission generically determined that spent fuel generated by any reactor can be safely stored onsite for at least 30 years beyond the licensed operating life of the reactor, which may include the term of a renewed license. In the rule, the Commission also generically determined that such storage could be accomplished without significant environmental impact. In addition, the Commission stated in the rule its belief that there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for any reactor to dispose of the spent fuel generated in such reactor up to that time. The "Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS)," NUREG-1437 is based upon the assumption that storage of the spent fuel onsite is not permanent. The plant-specific supplement to the GEIS regarding license renewal for the North Anna Power Station, Units 1 and 2, is based on the same assumption.*

Likewise, the matter of processing and storage of low level waste is considered a Category 1 issue. The conclusion regarding this issue in the GEIS included consideration of the long-term storage of low level waste on site during the license renewal term. The comments provide no new information; therefore, the comments will not be evaluated further.

Comment: On [page] 8-15, DOE Secretary Abraham has already determined that Yucca does not have enough space for the current waste that is being produced at the nuclear power plants. They can't put the high level waste away. And now we are going to add 20 more years. Where is that going to go? (NAD-H-16)

Comment: One primary thing is that in all the analysis of the environmental impact that the shipping, and the toxic waste storage was never looked at, and I think that is a major piece of this puzzle, that we are basically shipping off our dangerous and threatening waste off to somewhere else, so that someone else can deal with it. (NAD-K-3)

Comment: And we are, of course, hearing about the churches, the schools, the homes, that the nuclear waste casks will pass by, if and when transported to Yucca Mountain. A constant threat to my, and I believe to your, well-being. (NAD-I-11)

Response: *The comments are noted. Uranium fuel cycle and waste management are Category 1 issues as evaluated in the GEIS. Repository capacity is discussed in Section 6.4.6.2 of the GEIS. Transportation is discussed in Addendum 1 to the GEIS. The comments provide no new information; therefore, the comments will not be evaluated further. There was no change to the SEIS text.*

Comment: On [pages] 8-15 and 16, with MOX, Virginia Power is not out of the contract, they have not signed out of the contract on MOX. They bring the letter saying they are not going to do it. They flip flopped, lied, whatever you want to say, three or four times about their use of MOX. If MOX is used here, that changes the profile of the storage, waste, and all accidents. And significantly changes the environmental review. (NAD-H-17)

Response: *The comment is noted. At the time the VEPCo application for North Anna license renewal was submitted, the licensee stated that MOX fuel was not going to be considered for North Anna. The licensee's withdrawal from the Department of Energy's Plutonium Disposition Project (the source of the MOX fuel) is documented in a letter to the NRC dated April 24, 2000. To date, that position has not changed. However, if VEPCo sought to use MOX fuel in the future, it would do so by submitting a license amendment application to the NRC. Such an application would be processed as required under the NRC's regulations. In particular, the NRC would publish notice of the proposed action and an opportunity to request a hearing or file a petition for leave to intervene. If the North Anna licenses are renewed, and the applicant then*

files an application for the use of MOX fuel with the NRC, the staff's review would consider the period of the renewed licenses. The comment provides no new information, does not pertain to an issue within the scope of license renewal as set in 10 CFR Part 51 and Part 54, and will not be considered further.

Comment: In [page] 6-3 and following, let's get the figures right out there. How many tons of uranium are going to be mined, how many tons are going to be processed? What are the effects? They are saying, right in there, 12 additional cancer fatalities are going to be expected because of the renewal of this license. Who, in Louisa County, wants a member of their family to be one of those 12? You live here in the county, do you want a friend or a member of your family, your grandchild, your child, to be one of these additional 12 cancer fatalities? What kinds of cancer, how many additional cases of cancer? These are fatalities. They are saying there is no significant impact, and we are talking about 12 people who are going to die. That is no impact? There is a financial impact, there is an emotional impact. Specifically, it is going to affect the people who live up at the lake. I think they should know that. (NAD-H-10)

Response: *The comment is noted. There has been much concern and confusion regarding the statements in the Federal Register notice of July 30, 2001 (66 FR 39277) regarding potential long term health effects that may occur as a result of radiation doses from an additional 20 years of operation of nuclear power plants as a result of license renewal. According to 10 CFR Part 51, Subpart A, Appendix B, Table B-1, "the 100 year environmental dose commitment to the U.S. population from the fuel cycle, high level waste and spent fuel disposal excepted, is calculated to be about 14,800 person-rem or 12 cancer fatalities, for each additional 20 year power reactor operating term."*

This calculated value of 12 additional deaths from fatal cancer over the 20 years of additional operation of a nuclear power plant is the result of several conservative assumptions. This value is, in fact, a calculated upper bound value. It does not mean that 12 people in Louisa County will die from cancer as a direct result from an additional 20 years of continued routine operation of any nuclear power plant.

These calculations use the concept of collective dose. Collective dose estimates effects across a very large population, assuming that a small amount of radiation dose spread out among a large population would yield similar effects to a larger amount of radiation dose to a much smaller population. This is a very conservative assumption. The Health Physics Society, www.hps.org, states "[b]elow the dose of ten rem, estimations of adverse health effect is speculative. Collective dose remains a useful index for quantifying dose in large populations and in comparing the magnitude of exposure from different radiation sources. However, for a population in which all individuals receive lifetime doses of less than 10 rem above background,

collective dose is a highly speculative and uncertain measure of risk and should not be quantified for the purposes of estimating population health risks."

The cancer risk factors used in this calculation are also quite conservative. They are from the BEIR-V report, "Health Effects of Exposure to Low Levels of Ionizing Radiation[a]." In this report it is estimated that "if 100,000 persons of all ages received a whole body dose of 0.1 Gy (10 rad) of gamma radiation in a single brief exposure, about 800 extra cancer deaths would be expected to occur during their remaining lifetimes in addition to the nearly 20,000 cancer deaths that would occur in the absence of radiation. Because the extra cancer deaths would be indistinguishable from those that occurred naturally, even to obtain a measure of how many extra deaths occurred is a difficult statistical estimation problem."

The radiation dose contribution to the population from current nuclear power plants is estimated to be 4.8 person-rem, while the contribution to the population from the complete uranium fuel cycle is 136 person-rem per year. The dose to an individual is only a very small fraction of these population doses. The contribution to the average dose received by an individual from fuel cycle-related radiation and other sources is listed in Table A-3. The nuclear fuel-cycle contribution to an individual's average radiation dose as shown in the table is extremely small (less than 1 millirem per year).

At the request of Congress, the National Cancer Institute (NCI) conducted a study in 1990, "Cancer in Populations Living Near Nuclear Facilities," to look at cancer mortality rates around 52 nuclear power plants, nine Department of Energy facilities, and one former commercial fuel reprocessing facility. The NCI study concluded that "from the evidence available, this study has found no suggestion that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancers in populations living nearby." Additionally, the American Cancer Society has concluded that although reports about cancer case clusters in such communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do elsewhere in the population.

The Generic Environmental Impact Statement identified radiation exposures to the public during the license renewal term as a Category 1 issue. This comment provides no new information; therefore, the comment will not be evaluated further in the SEIS.

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[a] Prepared by the National Research Council, National Academy Press, Washington, D.C., 1990.

Table A-3. Annual Effective Dose Equivalent

Source	Dose (mrem/yr)	Percent of Total
Natural		
Radon	200	55
Cosmic	27	8
Terrestrial	28	8
Internal (body)	39	11
Total Natural	300	82
Artificial		
Medical X ray	39	11
Nuclear medicine	14	4
Consumer products	10	3
Other		
Occupational	0.9	<0.3
Nuclear Fuel Cycle	<1	<0.03
Fallout	<1	<0.03
Miscellaneous	<1	<0.03
Total Artificial	63	18
Total Artificial and Natural	**363**	**100**

Source: NCRP Report 93, "Public Radiation Exposure from Nuclear Power Generation in the United States" as abstracted by the University of Michigan (http://www.umich.edu/~radinfo/.)

A.1.13 Comments Concerning Category 2 Aquatic Resource Issues

Comment: Regarding aquatic species, potential impacts include the cooling water intake, discharge, and dam that provide the impounded cooling water. The rotating screens of the cooling water intake at the Power Station provide nearly unimpeded water intake, but the biota are likely to incur high mortality as a result of entrainment and impingement. There is probably less mortality associated with the cooling water discharge, but the effects on fish behavior and ecology are potentially damaging. Another fisheries impact is the Lake Anna Dam. While

downstream fish passage maybe acceptable, the blockage of upstream migrations of American eel, and possibly anadromous fish during high flow seasons, should be corrected during this relicensing. (NAD-W-2)

Response: *The comment is noted. The potential impacts of the entrainment of fish and shellfish in early life stages and impingement of fish and shellfish (both resulting from cooling water intake) and of heat shock (resulting from cooling water discharge) are evaluated in Sections 4.1.1, 4.1.2, and 4.1.3 of this SEIS, respectively. Detailed aquatic studies as part of the Section 316(a) and Section 316(b) demonstrations performed in compliance with the Clean Water Act, as well as ongoing annual monitoring of the Lake Anna fishery, have shown these impacts to be small. While the impacts of the North Anna Dam are outside the scope of this license renewal, as explained in Section 4.7.1 of this SEIS, the staff did review available data concerning the potential for anadromous fish and American eel migration in the vicinity of the North Anna Dam. Existing and historical data suggest there was never significant anadromous fish migration in the vicinity of the North Anna Dam. Both pre-operational and post-operational studies have verified the presence of the American eel; however, there is no evidence of impacts to the eel population associated with the presence of the North Anna Dam. The comment provides no new information and, therefore, will not be evaluated further.*

Comment: The North Anna facility lacks a component of the cooling water intake system that Virginia Electric and Power Company has developed at the Surry Power Station. The traveling mesh screens at the Surry Power Station include a spray wash system that removes the biota from the screens and returns them to the James River. The North Anna facility utilizes a similar technology for the screens, but fails to provide the mechanism to return the biota unharmed back to the Lake. The traveling screens and wash system at Surry clearly minimize aquatic impacts more than the North Anna facility, which discards the impinged biota into a disposal bin. A similar process, such as at Surry, could be developed to minimize the aquatic impacts by returning the impinged biota safely back to the Lake. To further minimize the impacts, we recommend replacing worn or damaged screens with mesh less than or equal to one millimeter wide and adopting entrance velocities less than or equal to 0.5 feet per second (Gowan, C. and G. Garman 1999). (NAD-W-4)

Response: *The comment is noted. The comment relates to design features of the plant that minimize the impacts to the aquatic environment. Under the Clean Water Act, VEPCo submitted results of impingement and entrainment studies that constituted the Section 316(b) demonstration for the North Anna Power Station in 1985. The Virginia State Water Control Board, the permitting authority, determined that the intake design will assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in Lake Anna. The Section 316(b) demonstration and subsequent post-operational studies (detailed in Sections 4.1.1 and 4.1.2 of this SEIS) did not reveal any significant adverse impact on fish or*

shellfish in Lake Anna due to impingement or entrainment. Therefore, additional mitigation is not warranted. Although there is currently no compelling reason to require changes to the current practice, the staff recognizes these impacts could potentially be further reduced through the use of the technologies described in the above comment. The comment will be provided to the utility for consideration. The comment provides no new information and, therefore, will not be evaluated further.

Comment: The cooling water discharge is an additional potential hazard to fish. Unlike the Surry Power Station that discharges to the mouth of the tidal James River, the North Anna Station discharges into a series of open canals that flow back to the Lake. While the thermal discharge is likely to have a greater effect in the colder months, the increased temperatures in the summer could also have an adverse effect on fish behavior and ecology in the Lake. (NAD-W-5)

Response: *The comment is noted. The impacts of heat shock (as a result of cooling water discharge into Lake Anna from the Waste Heat Treatment Facility) are evaluated in Section 4.1.3 of this SEIS. Detailed aquatic studies conducted as part of the Section 316(a) demonstration performed in compliance with the Clean Water Act, as well as ongoing annual monitoring of the Lake Anna fishery, have shown these impacts to be small. Cooling water discharge was found to slightly increase the already naturally-pronounced thermal stratification of the lake during the summer months. This was found to slightly reduce the already marginal habitat for stripped bass. This species is managed as a "put-grow-and-take" recreational fishery due to these and other habitat restrictions (streams that flow into Lake Anna appear to lack the flow, depth and length to support striped bass spawning runs). Therefore, this slight increase in summer lake temperature does not appear to have a significant impact on striped bass. Thermal discharges during the winter months were found to be beneficial to threadfin shad (an important forage fish to upper trophic level game fish) by providing a warm-water refugia during the winter months. This species would not likely survive in Lake Anna absent the operation of the North Anna Power Station. The comment provides no new information and, therefore, will not be evaluated further.*

Comment: The Lake Anna Dam provides cooling water for the Power Station, but also blocks migratory fish moving upstream from the North Anna River. (NAD-W-6)

Comment: Assess the upstream movement of fish to the Dam with continuous sampling of water quality, flow, and species composition from February 1 to November 30. The specific study design should be developed with the North Anna Power Station Staff, FWS, and other interested parties. (NAD-W-8)

Response: *The comments are noted. Impacts associated with the North Anna Dam are outside the scope of the license renewal. In response to comment NAS-AA-6, received during the scoping period, the impacts of dam operation to fish passage are described in Section 2.2.5. In addition, during the scoping and comment periods for the draft SEIS, the staff requested the Fish and Wildlife Service to make available any information on migratory fish in the vicinity of the North Anna Dam, and the staff reviewed existing available data concerning the movement of migratory fish in the vicinity of the North Anna Dam. There is currently no evidence of significant migratory fish movement in the vicinity of the North Anna Dam. The comments provide no new information and, therefore, will not be evaluated further.*

Comment: Determine the impacts from the thermal discharges on fish distribution, spawning, and feeding. The specific study design should be developed with the North Anna Power Station staff, FWS, other staff, and other interested parties. (NAD-W-7)

Response: *The comment is noted. As previously mentioned, the impacts of heat shock (as a result of cooling water discharge into Lake Anna from the Waste Heat Treatment Facility) are evaluated in Section 4.1.3 of this SEIS. Detailed aquatic studies conducted as part of the Section 316(a) demonstration performed in compliance with the Clean Water Act, as well as ongoing annual monitoring of the Lake Anna fishery, have shown these impacts to be small. The applicant currently works closely with the Virginia Department of Game and Inland Fisheries and the Virginia Department of Conservation and Recreation to cooperatively manage the aquatic resources of Lake Anna. Ongoing annual monitoring conducted since the original licensing of the plant has confirmed these impacts to be small. We have identified no new and significant information that would suggest these studies should be redone. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.14 Comments Concerning Category 2 Socioeconomic Issues

Comment: First of all, North Anna is a good -- they are good corporate citizens of Louisa County. They are vital to the economic development of Louisa County for these reasons: Employment opportunity, recreation areas for many people and their families, development that has been, and continues to be built around the lake. (NAD-A-1)

Comment: The voluntary contributions the corporation has made to many county projects, and not least of all the tax revenue source to the county, tremendous tax revenue. (NAD-A-3)

Comment: North Anna Power Station has been an outstanding neighbor in our community. It has been an economic boon to Orange County for more than 30 years, providing well paid jobs to many of our citizens. (NAD-C-2)

Comment: My office is staffed by more than 30 all volunteer men and women, and all the basic office's expenses are paid by the County Board of Supervisors, the only funding we receive in my office comes from North Anna Power Station. (NAD-C-4)

Comment: A renewed license would not only be important to Louisa County and Virginia, but also to me and 852 other North Anna employees, whose livelihood depends upon providing safe and reliable electricity to the customers of this State. (NAD-D-1) (NAD-Q-1)

Comment: Additionally, renewed licenses would assure the local community that it will continue to reap the benefit of having a large employer in the area, and Louisa County would continue to receive the tax revenue from the station's operation. (NAD-D-3) (NAD-Q-3)

Comment: Just as an aside, North Anna Power Station has provided 170 million dollars in tax revenue to Louisa County since the station started building some 30 years ago. (NAD-D-9) (NAD-Q-9)

Comment: And we reap the benefits of having, you know, greater [benefit from] taxes in our area. (NAD-K-4)

Comment: From an economic standpoint a lot of families enjoy a good quality of life because of the employment opportunities here, from Virginia Power. A lot of families would not have the opportunity to make the amount of money they do if Virginia Power were not here. (NAD-M-4)

Comment: Since 1966 Dominion Virginia Power has paid more than $170 million in property taxes to Louisa County. In 2001 alone, they contributed $10.99 million to the County's economy. (NAD-Y-2)

Comment: North Anna employs 825 people from the surrounding communities. They demonstrate their commitment to the community through active and frequent involvement. (NAD-Y-3)

Response: *The comments are noted. Socioeconomic issues specific to the plant are Category 2 issues and are addressed in Chapter 4 of the SEIS. The comments support license renewal at the North Anna Power Station, Units 1 and 2. The comments provide no new information and, therefore, will not be evaluated further.*

A.1.15 Comments Concerning Category 2 Postulated Accident Issues

Comment: I heard a person laugh about the chance of a tornado striking the plant. What are the chances that four airplanes would be simultaneously hijacked and flown into public

buildings? These same people would have laughed a year ago if somebody had said this. But we have to deal with possibilities. (NAD-H-3)

Response: *The comment is noted. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. Postulated accidents such as the ability of the North Anna Power Station to withstand a tornado or a large plane crash into the reactors are evaluated by the NRC as a part of its ongoing operational safety review process. The comment does not pertain to the scope of license renewal as set forth in 10 CFR Part 51 and Part 54. The comment provide no new information and, therefore, will not be evaluated further.*

Comment: On [page] 5-5, the NRC and VEPCO's reports have been challenged by many people, their mathematical modeling. And I don't even need to go much further than just saying that all of those mathematical models are sort of bogus. (NAD-H-9)

Response: *The comment is noted. Mathematical models are tools used to provide insight to complex problems. As set forth in Section 5.2.2.2 of this SEIS, the tools used in the SAMA analysis have been reviewed and are appropriate for this application. The comment provides no new information, and, therefore, will not be evaluated further.*

A.1.16 Comments Concerning Environmental Justice Issues

Comment: And, to me, that just exemplifies an environmental injustice, in which communities of lower income have been historically placed as sites for nuclear power plants to create a dependency upon the nuclear power plants by providing it with money, and community service. And so I would just like to point out that we are continuing this dependency that has already begun, and I think it is an unhealthy one. (NAD-K-6)

Response: *The comment is noted. Environmental justice refers to a Federal policy under which each Federal agency identifies and addresses, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low income populations. The staff did not find any adverse human health or environmental effects from license renewal on low-income or minority populations. Environmental justice issues and findings are discussed in Chapter 4 of the SEIS. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.17 Comments Concerning Alternatives to License Renewal

Comment: When we start talking about the [page] 8-23, natural gas, two new natural gas plants are already being built in this area. One in Gordonsville, and one in Fluvana. Another

one is proposed in Gum Springs. These plants already have natural gas, and transmission lines, and can produce up to 65 percent of North Anna's annual net output. The whole discussion they had in there about putting a natural gas plant at North Anna, and having to bring natural gas lines from Gordonsville, and all this disruption, it was just a waste of time and energy. (NAD-H-12)

Comment: In [page] 8-45 and following, again the discussion, no one source has to replace all of North Anna's production. Which was also noted earlier in there, by doing things like reduction on demand, or a combination. This entire section is fundamentally flawed, logically and realistically. And that is even noted, later, on page 8-49. The Staff's conclusion that these things could happen is seriously flawed. Dominion itself is constructing new power plants. (NAD-H-14)

Comment: And conservation and management demand could, by itself, save if they close North Anna, could save all of the production that is going on right there. (NAD-H-15)

Comment: And the second part of this that I see is that the analysis said that other alternatives to nuclear power show moderate to some -- some alternatives show moderate to large impacts while the nuclear power shows small impacts. But does it also point out that other impacts, do other alternatives do show probably even smaller impacts to the environment, such as wind, solar, and hydropower? That was also somewhat omitted from this conversation. (NAD-K-5)

Response: *The comments are noted. The purpose of the Section 8 of the SEIS is to examine potential environmental impacts that would be associated with replacing the power production provided by the nuclear plant with an alternative source, in the event that the license is not renewed for the nuclear plant. The purpose is to evaluate whether or not an alternative exists that would have less of an environmental impact than continuing operation of the nuclear plant. The gas plants that are mentioned in a comment (the Gordonsville, Fluvana, and Gum Springs proposals) are intended to meet the existing expanding power demands in the area, and thus, would not be sufficient to replace North Anna's power also. The discussion of alternatives in Chapter 8 includes the possibility of expanding gas power generation in the area at the North Anna site since at least some of the infrastructure needed to supply power is already in place. In addition, the discussion in the SEIS addresses the possibility, and the range of impacts, of alternative gas generation at a generic location other than North Anna, which could include Gum Springs or any of the sites mentioned.*

Although it is possible that additional conservation or demand management efforts could potentially replace some of North Anna's power, it seems unlikely that these efforts could replace all the power produced by North Anna. VEPCo currently integrates demand side management efforts into its projections for power generation needs. Because these

conservation assumptions are already part of the long-range plan for meeting projected demand, they are not available offsets for North Anna, Units 1 and 2. The comments provide no new information and, therefore, will not be evaluated further.

Comment: I see the beauties of alternative energy compared with a life threatening continuation of the nuclear energy plant. (NAD-I-2)

Comment: Most of the electrical energy we use is wasted. Strict conservation, wind, hydroelectric, solar, and geothermal could be adequate for our energy needs if we put a fraction of the financial resources into research for them that has been put into nuclear energy. (NAD-U-3)

Response: *The comments are noted. The comments provide no new information and, therefore, will not be evaluated further.*

A.1.18 Comments Concerning Out of Scope Issues: Operational Safety, Emergency Preparedness, Aging Management, and the Need for Power

Operational Safety and Emergency Preparedness

Comment: They are very safety conscious, which is vital to our county of Louisa. (NAD-A-5)

Comment: That the security team down at North Anna is probably one of the best I've seen. And the leadership there is excellent. (NAD-B-4)

Comment: The training that they get in the security training down there, in some areas, probably exceeds what the normal law enforcement agency would probably receive in some of those areas. (NAD-B-5)

Comment: I have been through their security training, I've been through a lot of safety training, I've seen management's attitude, and commitment to excellence in this field. (NAD-B-7)

Comment: The post 9/11 events naturally are a major concern for us here. And I can say, without getting into a grey area about safeguards stuff, that the protection of North Anna is of paramount importance to law enforcement agencies in this county, and surrounding counties, and the federal government. (NAD-B-8)

Comment: North Anna Power Station has a long history of safe, reliable, and efficient operation. Since the 1990s North Anna has consistently ranked as the most efficient producer of nuclear generated electricity in the United States, on a three year cost average. The station

has also achieved, and continues to achieve, high marks in safety and security performance from the Nuclear Regulatory Commission, and from the Institute of Nuclear Power Operations. (NAD-D-4) (NAD-Q-4)

Comment: That is not to mention the future employees that will be required to continue the safe operation of the plant well into this century. (NAD-D-8) (NAD-Q-8)

Comment: The group at North Anna is probably one of the most professional organizations that I've had the pleasure to work with. These folks really do put safety and security above all else. They have an operation that has multiple security checks, safety checks, both radiologic and security checks, based on other types of threats. And I think that is important for the community to know. These folks really have a good quality management, and quality improvement system in place, a lot of checks and balances. (NAD-N-1)

Comment: I think they've had an exemplary performance as far as safety and security is concerned, and I would wholeheartedly support their application for their 20 year renewal on their license. (NAD-N-2)

Comment: One thing I do have to say about Dominion Generation, or Virginia Power, is that to them safety is job one, it is a concern, they have a very great concern for the community. (NAD-P-1)

Comment: I can pick up the phone and call their emergency preparedness people and say, look, I need some assistance, and I will get a phone call back, and get some assistance, and whatever I need. (NAD-P-2)

Comment: Safety is so much of a concern that what we have done in the county, just for your information, is as new developments go up around the lake, within the 10 mile EPZ, we have kind of an informal agreement with the planning office, when a request for rezoning, or putting in a development into the ten mile EPZ comes across the planner's desk, and the Planning Commission, it comes down to my office for a review, we request siren easements. (NAD-P-3)

Comment: As I said, I'm a fire fighter, dealt with hazardous materials, and environmental impact. I know this is an environmental impact statement. I think dealing with hazardous materials, dealing with the terrorism threat that we've been doing, and one thing that we have been putting into our plan, is dealing with the potential terrorism threat. It is out there. (NAD-P-4)

Comment: I think the environmental impact of every day hazardous materials that come through this community, I fear are much more greater, than I do the nuclear power plant having

a problem. There is a lot of chemicals, and a lot of things that come through, that can do just as much harm, quicker, than radiation from the power plant., So we are preparing ourselves for everything in all categories. We have major interstates and railroads that go through here every day. And one thing I can rely on is the expertise, and the assistance of Virginia Power to assist us in those areas also. (NAD-P-5)

Comment: North Anna is one of the best designed, safest plants in this country. And I will tell you that, I know, because I've done the reviews on it. It is really one of the safest and best designed plants in this country. (NAD-T-2)

Comment: Dominion Virginia Power is committed to safety at North Anna Power Station. They plan it into all aspects of work activity. Safety work practices are reinforced through training and continuous improvement measures. (NAD-Y-5)

Response: *It is noted that the comments are in support of North Anna Power Station. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. The comments provide no new information, and do not pertain to the scope of license renewal as set in 10 CFR Part 51 and Part 54. Therefore, the comments will not be evaluated further.*

Comment: Lastly, concerning security, I've been around the world since 9/11, and I can tell you this. We are not prepared, we are not prepared for what is going to happen, and we are not prepared for the response. (NAD-H-18)

Response: *Operational safety, security and emergency preparedness are outside the scope of this environmental review. An NRC safety review for the license renewal period is conducted separately. Although a topic may not be within the scope of review for license renewal, the NRC is always concerned with protecting public health and safety. Any matter potentially affecting safety can be addressed under processes currently available for existing operating licenses absent a license renewal application. The comment provides no new information, and does not pertain to the scope of license renewal as set in 10 CFR Parts 51 and 54. Therefore, the comment will not be evaluated further.*

Comment: Second is I would like to encourage NRC to very carefully consider the credibility situation following the Davis Besse incident. And we ask, did you analyze so and so? You said, yes, we analyzed it. But it is your credibility that lets the public accept that statement of analysis. (NAD-G-2)

Response: *The comment is noted. As a result of recent discoveries of reactor vessel head degradation in the Davis Besse Nuclear Power Station's reactor pressure vessel head, the NRC*

is investigating the structural integrity of reactor vessel heads at 69 pressurized water reactors (PWRs). The NRC is very concerned about public safety and public perception. The NRC's mission is to regulate the Nation's civilian use of byproduct, source, and special nuclear material to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. The NRC has established an extensive regulatory process that contains five main components (1) developing regulations and guidance for our applicants and licensees, (2) licensing or certifying applicants to use nuclear materials or operate nuclear facilities, (3) overseeing licensee operations and facilities to ensure that licensees comply with safety requirements, (4) evaluating operational experience at licensed facilities or involving licensed activities, and (5) conducting research, holding hearings to address the concerns of parties affected by agency decisions, and obtaining independent reviews to support our regulatory decisions. The comment is noted. The comment provides no new information and relates to an operational safety issue and, therefore, will not be evaluated further.

Aging Management

Comment: Mention has been made of the aging process issue. And the many attempts that have been, that are being made to address it. There is also repetition of a phrase, cost beneficial. So we are not going to have a new plant, we are going to look at the cost beneficial aspects in replacing older items. (NAD-I-9)

Comment: We've seen, recently, at the Davis Besse plant in Ohio, that aging parts can be a route to catastrophic failure, without warning. Extension of the license of this plant increases the danger to our community. (NAD-I-10)

Comment: The 20 years I've been here, so 20 years North Anna has been here. Pretend this is a tin can stress, stress, stress, stress. North Anna has undergone 20 years of stress. What happens? Fatigue. I'm very fearful that we will have another Chernobyl here. Everywhere you go you hear, it couldn't happen here, it couldn't happen to me. All kinds of accidents, it wouldn't be me, couldn't be me. (NAD-S-1)

Comment: On [page] 6-8, on-site spent fuel. The pool is not designed to hold the waste for more than X number of years. And from its original design they've already crammed more fuel in there than was originally designed. We need to have an analysis of what are the effects of a concrete pool with another 20 years, with all that radiation. (NAD-H-11)

Response: *The comments are noted. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. Safety matters related to aging are outside the scope of this environmental review. An NRC*

safety review for the license renewal period is conducted separately. The comments provide no new information and will not be evaluated further in the context of the environmental review. However, the comments will be forwarded to the project manager for the license renewal safety review for consideration. To the extent that these comments pertain to managing the effects of aging on components and structures specified in 10 CFR 54.21 during the period of extended operation to ensure functionality, they will be addressed in the parallel safety review.

Need for Power

Comment: Currently, North Anna provides about 17 percent of the electric power used in Virginia. A renewed license would ensure that we could continue to provide that safe, reliable power, to our customers. (NAD-D-2) (NAD-Q-2)

Comment: There is a surplus of electricity right now, and a surplus of plants. The plants are being cancelled. (NAD-H-13)

Comment: North Anna Power Station plays an essential role in meeting the Commonwealth's energy needs. It produces approximately 17 percent of the electricity used by fellow Virginians, that is the equivalent to lighting up some 450 homes across the Old Dominion. (NAD-Y-6)

Response: *The comments are noted. As stated in 10 CFR 51.95(c)(2), the SEIS for license renewal is not required to include a discussion of the need for power. The comments provide no new information and, therefore, will not be evaluated further.*

A.1.19 Editorial Comments

Comment: On [page] 2-27, and following the pages there, they keep referring to Richmond County. Richmond County happens to be all the way on the eastern part of Virginia, not anywhere near here. All of the comments related to the sociological stuff that relate to Richmond County are ridiculous, they have nothing to do, and they should not belong in there at all. (NAD-H-4)

Comment: On [page] 2-41, Tradewinds they put in there as a major employer, they folded. Actually the major employment in the county, outside of Dominion Power, are the schools and the government, which were not mentioned at all. (NAD-H-5)

Comment: Page 1-9, Line 8: Table 1-1 indicates that the US Fish & Wildlife Service Migratory Bird Treaty Act Permit expired December 31, 2001. Depredation Permit Number MB705136-0 was renewed effective 4/22/02, and expires 3/31/03. It is suggested that this update be reflected in Table 1-1. (NAD-V-1)

Comment: Page 2-12, Line 34: The statement is made that, "An onsite solvent shop recycles paint." The following correction is suggested as a replacement: "An onsite paint shop recycles solvent." (NAD-V-2)

Comment: Page 2-13, Line 2: The statement is made that, "Non-radioactive liquid waste produced...(e.g., water treatment activities, stormwater runoff, housekeeping wastes) are sampled and treated..." The statement is not accurate without exception. It is suggested that "housekeeping wastes" be deleted from this statement since there are waste disposal processes in which not all "housekeeping wastes" are sampled. (NAD-V-3)

Comment: Page 2-17, Line 29: It is stated that "The US EPA has authorized VDEQ to implement NPDES within the State." It is suggested that the statement read "The US EPA has delegated implementation of NPDES to VDEQ within the Commonwealth of Virginia." to reflect the actual federal-to-state relationship. (NAD-V-4)

Comment: Page 2-18, Line 14: It is stated "...that annual average wind power rated as 1 on a scale of 1 to 7 (Elliott, et al. 1987). It is suggested that the following words be inserted "...on a scale of 1 to 7, with 1 being the lowest..." prior to the reference callout. (NAD-V-5)

Comment: Page 2-22, Lines 21-22, Table 2-2: The slippershell mussel (*Alasmidonta viridis*) is given as a Federal-listed species. Based on a 2002 review of the Virginia Fish & Wildlife Information Service web site for the slippershell mussel, this species only occurs in the extreme western part of the Commonwealth of Virginia. It is not considered to occur in streams in counties adjacent to Lake Anna, immediately upstream or downstream North Anna River, or in counties crossed by North Anna transmission line corridors. Table 2-1 of the License Renewal Application Environmental Report does not list this species as a species of concern, and the description of this species within the SEIS implies it is of potential concern for the area in which North Anna Power Station is located. It is therefore requested that this species be deleted from the SEIS. (NAD-V-6)

Comment: Page 2-24, Table 2-3, and Page 2-25, Lines 4-7: The sensitive joint-vetch is listed in Table 2-3 and discussed on Page 2-25, yet stated "It is not known to occur at North Anna or the transmission line rights-of-way." Based on a review of the Virginia Fish & Wildlife Information Service web site for the sensitive joint-vetch, this species is only located along tidally-influenced fresh waters. This is not the case for North Anna, near Lake Anna, nor for any transmission line corridors for North Anna Power Station. The description of this species within the SEIS implies it is of potential concern for the area in which North Anna Power Station is located. It is therefore requested that the listing and description of this species be deleted from the SEIS. (NAD-V-7)

Comment: Page 2-28, Line 50: It is stated that "Louisa County is currently updating its plan (VEPCo 2001b)." Louisa County approved an updated Louisa County Comprehensive Plan in September 2001, referenced on Page 2-51, Lines 33-34. This statement should be updated accordingly. (NAD-V-8)

Comment: Page 2-30, Table 2-7: Table 2-7 is titled "Population Growth...1980-2010". Population data includes Richmond City & County. It is suggested the title read "Estimated Population Growth..." Population data given in Table 2-7 varies from the License Renewal Application Environmental Report due to the inclusion of Richmond City & County. Richmond County is not located in the population zone for consideration. (NAD-V-9)

Comment: Page 2-30, Lines 21-22: It is stated that Henrico County provides water to approximately 80,215 customers. The License Renewal Application Environmental Report stated 74,000 customers, and the Draft SEIS references the ER. We cannot substantiate the source of the SEIS number and suggest that the number be revised to reflect the LRA ER identified number of customers, or the source of the SEIS number specified. (NAD-V-10)

Comment: Page 2-30, Line 30: It is stated that the maximum capacity of the City of Richmond is 128 MGD. The License Renewal Application Environmental Report stated the maximum capacity at 132 MGD. We cannot substantiate the source of the SEIS number and suggest that the number be revised to reflect the LRA ER number, or the source of the SEIS number specified. (NAD-V-11)

Comment: Page 4-42, Line 23: It has been determined that impacts "...would be SMALL,..." It is requested that the following words be added to the above sentence to be consistent with Endangered Species Act wording and Surry Draft SEIS conclusion statements: "would be SMALL and would not be adversely affected,...". (NAD-V-12)

Comment: Page 4-44, Lines 24-27: It is written that the NRC staff will inform VEPCo of comments provided by FWS and recommend further dialogue. It is requested that this statement be changed to reflect recent discussions regarding this issue and the final course of action as determined by NRC staff. We recommend that the April 30, 2002 correspondence from NRC to FWS be referenced for completeness. (NAD-V-13)

Comment: Page 5-22, Line 32: There is a "?" provided in the APE formula. The question mark "?" should be a "delta symbol" in the APE formula. (NAD-V-14)

Comment: Page 5-23, Line 16: It is written that "This higher value is primarily due to the high frequency of SGTRs...". It is requested that the words "frequency of" be replaced with "contribution to CDF from". (NAD-V-15)

Comment: Page 8-35, Line 24-35: It is written that "Approximately 200 ha (500 ac) would be needed for the construction of the new plant." Since the initial Final Environmental Statement for North Anna Power Station was written for four units, it should be summarized that no additional land may be needed for construction of a new plant. (NAD-V-16)

Comment: Page 9-6, Lines 20-21: It is written that "The most significant resource commitments related to operation during the renewal term are the fuel and permanent storage space." It is our presumption that permanent storage space refers to a national repository. In light of recent federal government actions regarding spent fuel disposition, it is requested that this statement be changed to reflect federal direction, and add the word "offsite" to the phrase "permanent storage space" to be consistent with the phrase "permanent offsite storage space" in Line 18. (NAD-V-17)

Response: *The comments are noted. As appropriate, the comments resulted in modification of the SEIS text.*

A.2 Public Meeting Transcript Excerpts and Comment Letters

Transcript of the Afternoon Public Meeting on June 25, 2002, in Louisa, Virginia

[Introduction, Mr. Cameron]
[Presentation, Mr. Tappert]
[Presentation, Mr. Tabatabai]
[Presentation, Mr. Kugler]
[Presentation, Ms. Hickey]

NAD-A Mr. Wright: I'm Jack Wright, I'm with the Board of Supervisors of the southeastern portion of the county. And to make sure that I'm concise, and I put all my points in, I will basically read, and make sure I can see it.

NAD-A-1 First of all, North Anna is a good -- they are good corporate citizens of Louisa County. They are vital to the economic development of Louisa County for these reasons: Employment opportunity, recreation areas for many people and their families, development that has been, and continues to be built around the lake.

NAD-A-2 There are volunteer projects in which the employees have participated, and these are many things that they have done for the county, and assisted us with.

NAD-A-3 The voluntary contributions the corporation has made to many county projects, and not least of all the tax revenue source to the county, tremendous tax revenue.

NAD-A-4 | It is a well managed corporation. They've shown signs of this in so many ways, in the nine years that I have lived here, which is a key to any kind of good operation.

NAD-A-5 | They are very safety conscious, which is vital to our county of Louisa, and most of you have just discussed this in some detail, but very safety conscious.

NAD-A-6 | We want them to continue as a part of Louisa County for many years to come. Thank you.

Mr. Cameron: Thank you, very much, Mr. Wright. Next we are going to hear from two officials from the safety and emergency preparedness field. First of all we are going to go to Major Donald Lowe, who is with the Sheriff's office in Louisa County.

Please come up here.

NAD-B | Major Lowe: Thank you, sir. Good evening, ladies and gentlemen. I'm Major Lowe, from the Louisa County Sheriff's office, and I'm just going to take a couple of minutes of your time, and talk a little bit about safety and security at North Anna. I have been fortunate to have a professional working relationship with North Anna, off and on, probably for over the last 22 years, and also fortunate enough to be able to experience a lot of the programs that they have, in terms of security.

NAD-B-7 | I have been through their security training, I've been through a lot of safety training, I've seen management's attitude, and commitment to excellence in this field.

NAD-B-1 | And I have to say that I'm extremely impressed here, not only by the quality of people, and the quality of programs that they have, but the attitude in general. I think that they are very concerned about this county, and the safety and welfare of this county.

NAD-B-2 | And they are also good corporate neighbors for us. The things that they do for our county in terms of support to the county itself. And I know in law enforcement agencies, and emergency services, and other agencies, they have been tremendous in that area.

NAD-B-3 | And I think you can look at that, over the last couple of weeks, it is just simply by the volunteers that were walking up and down the streets here, in the county, picking up bags and bags on litter, that were on the side of the road, these are volunteers. And that is all attitude.

NAD-B-8 | The post 9/11 events naturally are a major concern for us here. And I can say, without getting into a grey area about safeguards stuff, that the protection of North Anna is of paramount importance to law enforcement agencies in this county, and surrounding counties, and the federal government.

And that we are aggressively pursuing all our options, and anything that is available to us, to
NAD-B-4 make sure that North Anna is a safe place here. That the security team down at North Anna is probably one of the best I've seen. And the leadership there is excellent.

NAD-B-5 The training that they get in the security training down there, in some areas, probably exceeds what the normal law enforcement agency would probably receive in some of those areas.

Again, I feel very comfortable with North Anna being there. And I guess the only way I can kind of prove my assertions up here is just to let you know that over the last month or so, we finally finished building our house two miles from North Anna.

NAD-B-6 And I feel very safe, and very happy, and I tell you, it is a pleasure to not only work with these people, but associate with them, and have them be a part of the community here.

Mr. Cameron: Thank you very much, Major Lowe.

Next we are going to go to Duff Green, who is with the emergency operation center in Orange County.

NAD-C Mr. Green: My name is Duff Green, I'm the emergency management coordinator for Orange County, Virginia.

Others have given the background. I'm eighth generation native of Orange County. I'm a graduate from the University of Virginia with a major in biology, and I appreciate the environment concern that the NRC has for North Anna.

But being a native, here for 74 years, I have never seen a bald eagle. I served almost 20 years on the Orange County Board of Supervisors, the following four years as chairman of the board.

I'm not employed by Dominion Virginia Power, I have no relatives who work there, and I do not own any stock in this electric company. On the other hand I've had an association with the North Anna Nuclear Power Station since the late 1970s, when I first went on the Orange County Board of Supervisors.

The reason for this being the fact that Orange is considered one of the five risk counties surrounding the power station, and the board of supervisor's chairman, by Virginia law, is the director of emergency management.

As the emergency management coordinator one of my jobs is to study, train, and maintain plans for a possible radiological accident that may occur at the North Anna plant.

NAD-C-1 We hold numerous drills of all kinds in cooperation with NAPS, and we make numerous visits to the plant for training, and information. As an outsider I'm convinced that the North Anna Power Station is an excellently run plant with highly trained professionals in charge.

They keep my office informed on all activities, even the most unimportant occurrences. There are simulated drills by evaluators from the Federal Emergency Management Agency.

NAD-C-2 North Anna Power Station has been an outstanding neighbor in our community. It has been an economic boom to Orange County for more than 30 years, providing well paid jobs to many of our citizens.

NAD-C-4 My office is staffed by more than 30 all volunteer men and women, and all the basic office's expenses are paid by the County Board of Supervisors, the only funding we receive in my office comes from North Anna Power Station.

NAD-C-3 I have nothing but praise for this Dominion Virginia Power operation. Its open communication, and it safety conscious employees. Thank you.

Mr. Cameron: Thank you very much, Mr. Green.

Before we go to some other members of the community, we are going to hear from some officials of Dominion Virginia Power to talk, tell us a little bit about their rationale for license renewal, their vision behind this.

And first we are going to go to Mr. Jack Davis, who is the director of nuclear safety, and licensing, at the North Anna station, and then he will be introducing you to Jud White, who is the environmental manager for Dominion. Jack?

NAD-D Mr. Davis: Thank you. Good afternoon, ladies and gentlemen. I'm Jack Davis, and I'm the director of nuclear station safety and licensing at North Anna Power Station.

I would like to take this opportunity to thank the Nuclear Regulatory Commission for holding this important meeting to receive public comment on the NRC's supplemental environmental impact statement that supports Dominion's application for license renewal for North Anna Power Station.

We welcome the public comment process, and we believe that Dominion, Louisa County, and other nearby communities all have a stake in the future of North Anna Power Station.

NAD-D-1 As an employee of Dominion I'm excited about the license renewal for North Anna. A renewed license would not only be important to Louisa County, and Virginia, but also to me and 852 other North Anna employees, whose livelihood depends upon providing safe and reliable electricity to the customers of this state.

NAD-D-8 That is not to mention the future employees that will be required to continue the safe operation of the plant well into this century.

NAD-D-2 Currently North Anna provides about 17 percent of the electric power used in Virginia. A renewed license would ensure that we could continue to provide that safe, reliable power, to our customers.

NAD-D-3 Additionally, renewed licenses would assure the local community that it will continue to reap the benefit of having a large employer in the area, and Louisa County would continue to receive the tax revenue from the station's operation.

NAD-D-9 Just as an aside, North Anna Power Station has provided 170 million dollars in tax revenue to Louisa County since the station started building some 30 years ago.

I would like to digress for just a moment, and tell you a little bit about myself, and how I came to be associated with North Anna Power Station. I began my professional life in the nuclear Navy, during which time I had the pleasure of three tours as commanding officer.

First of the USS Baton Rouge, a nuclear powered attack submarine, then the Navy's three reactor training facility, near Idaho Falls, Idaho. And last, the USS L.Y. Spear, which is a nuclear submarine repair ship.

I joined Dominion in the fall of 1997 as the assistant superintendent of outage and planning. And in the summer of 1999 I entered the senior reactor operator license class, and received my license from the Nuclear Regulatory Commission in October of 2000. In November of that same year I assumed my current duties at the station.

NAD-D-4 North Anna Power Station has a long history of safe, reliable, and efficient operation. Since the 1990s North Anna has consistently ranked as the most efficient producer of nuclear generated electricity in the United States, on a three year cost average.

The station has also achieve, and continues to achieve, high marks in safety and security performance from the Nuclear Regulatory Commission, and from the Institute of Nuclear Power Operations.

During the period 1993 through 1997, the Nuclear Regulatory Commission, in its oversight program, then known as the systematic assessment of licensee performance report, graded North Anna as having superior safety performance in all station functional areas.

Under the NRC's new reactor oversight process the results of which are updated quarterly, on a quarterly basis, on the Commission's website, North Anna continues to fully meet the NRC safety cornerstone objectives.

Additionally, since 1991, the Institute of Nuclear Power Operations has also consistently awarded North Anna its highest marks for nuclear safety and operational excellence.

As to environmental performance, our commitment to environmental stewardship dates back to the construction days of the power station in '60s and '70s. North Anna Power Station was designed so that the water that is used to cool the steam that generates electricity, discharges into an innovative 3,400 acre system of lagoons that returns the water to Lake Anna at nearly normal temperatures.

NAD-D-5 We also have a conservation effort that focuses on protecting and enhancing fish populations in the lake. Special structures of brush and cinder blocks were constructed and sunk in the lake to improve the fish habitat.

Our biologists regularly sample, or monitor the health of the fish population. And that data is compared with data that was taken prior to our first day of operation.

These comparisons have consistently shown that North Anna Power Station is not harming the lake's fish population.

NAD-D-1 In preparing North Anna's relicensing application more than 50 individuals have spent, literally, thousands of hours reviewing all environmental aspects of continued plant operation.

The report concluded that continued operation of North Anna Power Station beyond 40 years will not negatively impact the environmental surrounding of the plant.

In a moment Dr. Jud White, Dominion's manager of environmental policy and compliance, will share with you more about our environmental programs, and review the findings of the NRC draft report.

Finally I would like to thank you all on behalf of Dominion for allowing us to do business in
NAD-D-6 Louisa County. We strive to be a good corporate citizen, and have enjoyed the professional

supportive working relationship that we have with the county, and the other local communities surrounding the station.

NAD-D-7 As many of you know, Dominion has a long-standing tradition of investing in the communities it serves through volunteer and philanthropic activities. Many of our employees demonstrate their commitment to the community by participating in programs such as Adopt a Highway, Thanksgiving Baskets for the Needy, blood drives, supporting the area Boy Scouts, and many other community activities.

Our volunteer programs and civic participation are an essential element of Dominion's corporate philosophy. We will continue our commitment to our communities in the future.

Again, I appreciate the opportunity to speak to you about North Anna Power Station's license renewal. I would now like Jud White, if he would provide you some more details on the environmental aspects of our application. Jud?

NAD-E Dr. White: Thank you, Jack. As Jack said, my name is Jud White, I'm the environmental manager at Dominion, with responsibilities for environmental compliance activities at all of our power stations in Virginia, as well as other states. But it also includes the North Anna Power Station.

I have over 25 years experience in the environmental field. My first ten years of my career I spent at North Anna, with responsibilities for studies, environmental studies in the lake, as well as the downstream North Anna River.

I do have a master's degree in Biology, and a PhD in environmental policy. I was directly involved and helped in assisting the Dominion nuclear team, helping them prepare the license renewal application to NRC. And, in particular, I helped develop the environmental report to the NRC, and coordinated with federal and state environmental agencies.

We commend the NRC in developing what is, in my opinion, a high quality and professional
NAD-E-1 draft supplemental environmental impact statement. The impact statement is a thorough, in my opinion, and accurate scientific assessment of the potential environmental impacts associated with the proposed action.

NAD-E-2 We support and agree with the conclusions of the NRC Staff that renewing the North Anna Power Station operating license is a reasonable action that will not result in any noticeable impact to the environment.

Basically this means, as has been said several times already, that the license renewal option is preserved, or remains acceptable for the power station to continue to provide safe and reliable, and clean electricity to the Commonwealth of Virginia.

We prepared, over a several year period, and submitted to the NRC an extensive environmental report for license renewal that was part of the information used by NRC in developing their supplemental environmental impact statement.

I say in part because it was just one area where the NRC relied on information. They had other sources including what was mentioned earlier, the generic environmental impact statement, the extensive consultation with federal, state, and local authorities, and environmental agencies, independent review by the NRC Staff, National Laboratory consultants, and the consideration of the public comments during the scoping process, which was held last fall, here.

Of particular note, relative to information sources, Dominion proactively engaged in discussions and meetings with key state, federal, and environmental agency staffs very early in the license renewal process.

This helped ensure that all issues were identified and appropriately addressed in the environmental review submitted to NRC. Dominion also proactively communicated with environmental and other pertinent stakeholders about license renewal.

This helped considerably, in my opinion, in the development of a thorough and accurate report. The report speaks specifically, and it has been mentioned somewhat previously, about specific impacts to fish, various aquatic resources, and is listed in detail in the report.

The report goes back to studies that began in the early '70s, even before the plant went operational. The creation of Lake Anna, a key point for this area, it created by damming up the North Anna river, it created Lake Anna, which is a 9,600 acre impoundment.

It basically ameliorated the effects of the communities downstream from Contrary Creek, which is a known source of acid mine drainage in the area. And as a result of impounding the river, and creating the lake, that impact was greatly reduced.

Also many of you who are fishermen probably are well aware that Lake Anna continues to rank high in the state as a trophy bass lake in Virginia, which is a clear indication that the underlying food chain, on which it depends, is healthy and stable.

NAD-E-3 Based on the review of all of the historical information, including the annual monitoring, which does continue today, the NRC concluded that potential impacts to aquatic operations are small, and that additional mitigation is not warranted, and we do agree with that finding.

To work with the NRC in evaluating the current applicability of the generic environmental impact statement, that information in it, as it pertained to generic issues, requiring no further review, Dominion developed an internal procedure, and protocol, to identify any new and significant information related to those issues that NRC identified as generic.

NAD-E-4 As a result of that process no new information was identified, but we did go through the process, as it was important to do. This activity is considered very important, in my opinion, in all license renewal projects for verification of the findings in the generic environmental impact statement.

We also agree with the NRC findings that the potential impacts of license renewal for the remaining environmental issues evaluate separately in the impact statement are small, and of noteworthiness is that a significant consideration is that there is no new major construction or land disturbing activity associated with this license renewal process.

As a result a lot of the impacts were considered small. In essence current measures to mitigate environmental impacts associated with operations were found to be adequate.

Dominion, and its entire staff, its entire environmental staff, takes pride in its environmental performance, and its positive relationships with environmental agency staffs, environmental organizations, the general public, and community neighbors.

It goes without saying that developing that relationship takes time to foster, as well as a major commitment by upper management for openness and candor, which I'm proud that we have.

Examples of these relationships that we have with the various groups and organizations, including the Department of Environmental Quality, the Virginia Department of Game and Inland Fisheries, Lake Anna Civic Association, as well as Lake Anna Advisory Committee, and the River Association.

In this license renewal process we want to ensure that we continue on this path, and not do anything adversely impacting our future performance or relationships with these groups.

Dominion believes that our obligation to provide safe and reliable energy from nuclear power extends well beyond this license renewal milestone. Federal, state, and local oversight will

continue to test and challenge, just as it does today, our standard of environmental excellence, and the conduct of our daily business.

We welcome all comments on the contents of this supplemental environmental impact statement, during the comment period, and we look forward to working positively and constructively with NRC staff. Thank you.

Mr. Cameron: Thank you, Jud. We are going to start with Mr. James Kogle, then we will go to William Murphy, and then to Jerry Rosenthal. Mr. Kogle?

NAD-F Mr. Kogle: Good afternoon. I'm Jim Kogle, I'm vice president of the Windwood Coves Property Owners Association in Louisa County.

Windwood Coves represents a residential community of approximately 260 properties, which about 50 percent are currently built up. We are a mixture of full time residents, and also some weekend people, that are certainly enjoying the lake.

We are located about a mile north, if you will, up lake from the plant. I have been associated with Virginia Power since I went on our first Board of Directors back in the mid-1960s, when Windwood Coves was developed.

NAD-F-1 And I must say our experience with Virginia Power has been nothing but absolutely terrific. They have been wonderful neighbors, very sensitive to the environment, sensitive to recreational issues. And we certainly support, very much, the relicensing effort of the power plant.

Thank you.

Mr. Cameron: Thank you Mr. Kogile. Next let's hear from Mr. Murphy.

NAD-G Mr. Murphy: Hi, my name is Bill Murphy, I'm a resident of Louisa County and, in fact, live right on the lake myself.

NAD-G-1 First thing is I'm in favor of renewing the license for North Anna. I think it is a safe operation, I think it is a benefit to the population as a whole, and Louisa County in particular.

NAD-G-2 Second is I would like to encourage NRC to very carefully consider the credibility situation following the Davis-Besse incident. And we ask, did you analyze so and so? You said, yes, we analyzed it. But it is your credibility that lets the public accept that statement of analysis.

NAD-G-3 Third is actually the plant is a benefit to the environment. Mr. Green hasn't seen any eagles, but we have certainly seen them. There are a couple that fish on Contrary creek, there is one that fishes right across from us at the state park.

And at one time we were sitting out, and there was one fishing right in front of our house. So we know there are eagles there, we've seen them.

NAD-G-4 The second part of the environment is the warm blooded part, and that is there is estimated that there are about 500 beavers around the lake. That population has remained constant over the past 20 years.

NAD-G-5 We have seen fresh water otters, muskrats there as well. And so I would go to the other side and say that the existence of the plant is actually a benefit to the habitat of the wildlife, and has increased the wildlife around in this area.

NAD-G-6 So the final close, we are in favor of renewing the license, and thanks for the statement.

Mr. Cameron: Thank you, very much, Mr. Murphy. And let's go to Mr. Rosenthal.

NAD-H Mr. Rosenthal: I'm Jerry Rosenthal, I'm the president of Concerned Citizens of Louisa County. We have been an environmental organization dealing with North Anna for over 25 years.

Been involved with the Concerned Citizens since Virginia Power first proposed transshipping waste from Surrey, to store up at North Anna, which they assured us if they did not get that waste moved from Surrey to North Anna, they were going to close North Anna. Of course that never happened. We will deal with that.

A few other quick notes. I'm a fifth generation Virginian, I'm a stock owner on Dominion Power, and I have a list of comments, and I'm going to comment by the page number. And you can take it from there, out of the book.

NAD-H-1 On page 2-10 it says: There is going to be increased liquid waste releases in the next 20 years. The question with all the releases, and the stuff, the gaseous, the liquid, or the solid waste, is we are talking about comparative versus cumulative.

There are going to be greater releases if the plant is extended for 20 years. That is logical. They are there, it is going to be operating. They may not be releasing more five years from now, than they are releasing now, but cumulatively they will be releasing more.

NAD-H-2 On 2-12, the low level compact for radiological waste, is non-operational. Barnwell promises to close to outside, people from outside South Carolina. The low level waste is currently stored on-site, including two generators, with no plans to be cut and removed. There are significant problems with storage, disposal, and accumulation of low level solid waste, radioactive.

NAD-H-3 I heard a person laugh about the chance of a tornado striking the plant. What are the chances that four airplanes would be simultaneously hijacked and flown into public buildings? These same people would have laughed a year ago if somebody had said this. But we have to deal with possibilities.

NAD-H-4 On 2-27, and following the pages there, they keep referring to Richmond County. Richmond County happens to be all the way on the eastern part of Virginia, not anywhere near here. All of the comments related to the sociological stuff that relate to Richmond County are ridiculous, they have nothing to do, and they should not belong in there at all.

NAD-H-5 On 2-41, Tradewinds they put in there as a major employer, they folded. Actually the major employment in the county, outside of Dominion Power, are the schools and the government, which were not mentioned at all.

NAD-H-6 In 4-4, they say thermal stratification to the lake is not a problem, but on 4-16 it is noted in the thing as pronounced in the lake. I'm not sure how you can either have it pronounced and not a problem, or maybe stratification is not a problem.

NAD-H-7 On 4-24, long term effects of exposure to low level radiation has not been studied, we don't have information. What are the effects for 30 years? So we are having a hard problem to know how these effects could be judged or estimated.

NAD-H-8 On 4-40 Virginia Dominion Power is building a new building at the plant site, which is going to affect water use and quality, as well as discharge. That information is not included in here. This new building was just announced this month.

NAD-H-9 On 5-5, the NRC and VEPCO's reports have been challenged by many people, their mathematical modeling. And I don't even need to go much further than just saying that all of those mathematical models are sort of bogus.

NAD-H-10 In 6-3 and following, let's get the figures right out there. How many tons of uranium are going to be mined, how many tons are going to be processed? What are the effects? They are saying, right in there, 12 additional cancer fatalities are going to be expected because of the renewal of this license.

Who, in Louisa County, wants a member of their family to be one of those 12? You live here in the county, do you want a friend or a member of your family, your grandchild, your child, to be one of these additional 12 cancer fatalities?

What kinds of cancer, how many additional cases of cancer? These are fatalities. They are saying there is no significant impact, and we are talking about 12 people who are going to die. That is no impact?

There is a financial impact, there is an emotional impact. Specifically it is going to affect the people who live up at the lake. I think they should know that.

Go back to your association and tell them that 12 additional people, there are 12 additional cases of cancer, and see what type of support you get.

NAD-H-11 On 6-8, on-site spent fuel. The pool is not designed to hold the waste for more than X number of years. And from its original design they've already crammed more fuel in there than was originally designed.

We need to have an analysis of what are the effects of a concrete pool with another 20 years,
NAD-H-19 with all that radiation. The pads are limited. Louisa County has the right to limit storage of waste on those pads.

That was part of the conditional use permit. If the county limits the waste storage on the pads, what are the effects, where are they going to put the waste?

If we are opening for 20 more years, and the county doesn't allow it, where is that waste going to be? If they don't allow it there, they are going to have to have another one, and there is going to be an environmental impact.

NAD-H-12 When we start talking about the 8-23, natural gas, two new natural gas plants are already being built in this area. One in Gordonsville, and one I Fluvana. Another one is proposed in Gum Springs.

These plants already have natural gas, and transmission lines, and can produce up to 65 percent of North Anna's annual net output. The whole discussion they had in there about putting a natural gas plant at North Anna, and having to bring natural gas lines from Gordonsville, and all this disruption, it was just a waste of time and energy.

That wasn't going to happen. Dominion already is one of the largest natural gas producers, and marketers in the country. They are putting up natural gas plants, they've canceled, in the

last year, they've canceled more plants than had the output of North Anna, that they had already announced.

NAD-H-13 There is a surplus of electricity right now, and a surplus of plants. The plants are being canceled.

NAD-H-14 In 8-45 and following, again the discussion, no one source has to replace all of North Anna's production. Which was also noted earlier in there, by doing things like reduction on demand, or a combination. This entire section is fundamentally flawed, logically and realistically.

And that is even noted, later, on page 8-49. The Staff's conclusion that these things could happen is seriously flawed. Dominion itself is constructing new power plants.

NAD-H-15 And conservation and management demand could, by itself, save if they close North Anna, could save all of the production that is going on right there.

NAD-H-16 On 8-15, DOE Secretary Abraham has already determined that Yucca does not have enough space for the current waste that is being produced at the nuclear power plants. They can't put the high level waste away. And now we are going to add 20 more years. Where is that going to go?

They don't have it, it is a fundamental flaw, you can't produce it if you don't have a place for it to go. Even with Yucca fully operational, they can't take the waste from the nuclear power plants.

NAD-H-17 It is ridiculous to say we will do it, and then we will deal with it later. On 8-15 and 16, with MOX, Virginia Power is not out of the contract, they have not signed out of the contract on MOX. They bring the letter saying they are not going to do it.

They flip flopped, lied, whatever you want to say, three or four times about their use of MOX. If MOX is used here, that changes the profile of the storage, waste, and all accidents. And significantly changes the environmental review.

NAD-H-18 Lastly, concerning security, I've been around the world since 9/11, and I can tell you this. We are not prepared, we are not prepared for what is going to happen, and we are not prepared for the response.

It is a sad thing, America is a wonderful open society, and we are just not ready. So I encourage the NRC to take this very seriously, and look at it, and try to deal with the real reality of this new world since 9/11. Thank you.

Mr. Cameron: Thank you, Mr. Rosenthal for those detailed comments.

Before I ask Andy to address the question from before, we did get a letter from the Town Manager here in Louisa, Mr. Morrison, who couldn't be with us today, and we are going to attach that to the transcript.

But because it has been submitted I thought I would just read one main paragraph, for your information. It doesn't mean anything more than that. And this is from Mr. Morrison, Town Manager of the Town of Louisa.

NAD-Y-4 North Anna Power Station commitment to the environment is above reproach. Nuclear energy itself does not produce any of the air emissions associated with fossil fuel generation plants. Thus nuclear generation helps to protect the environment. The company's conservation efforts focus on protecting and enhancing fish populations, as well as migratory birds through policies, procedures, and permits obtained from the United States Fish and Wildlife Service.

As good stewards to the environment Dominion biologists regularly monitor the health of fish populations with no harmful results found. As I perceive it, North Anna Nuclear Power Station is environmentally safe, environmentally sound, and environmentally responsible.

If you want to see the entire letter it is on the transcript. And, Andy, I will just ask you to make sure that we have a copy of this, also, to take back to Rockville with us.

Now, Andy, do you have -- are you ready to respond to the question that was asked previously?

Mr. Kugler: Jerry, you raised a question related to the inspections of the vessel heads, and results of that.

What I have here is a letter that Dominion wrote back to us. This is in response to bulletin 2002-01. And I believe that bulletin was as a result of -- that may be the result of the Davis-Besse –

But, at any rate, they have inspected the vessel heads. And I think this may be what you were referring to. On North Anna Unit 1 they did find some boron deposits on the reactor vessel head.

And what I was saying was they didn't find any wastage. In other words, there was boron there, but it had not been corroded the metal. I guess I believe that -- I'm not an expert in this

area, but I believe that they indicated that it had not been there very long, or at least it had not had an environment that encouraged the corrosion.

The boron deposits by themselves won't corrode it, you have to have moisture. And normally there is plenty of moisture in the containment, that is the nature of it.

I'm trying to see what else I've highlighted here. There is a degradation, in other words, wastage of the reactor vessel head base metal was not observed on the reactor vessel head, including the area around the penetrations that are required in care or evaluation, and the boric acid residue deposits were removed, visual inspections were performed.

I'm trying to see if there is anything else. In the case of North Anna Unit 1, and Surry Unit 1, even where leakage was suspected, no evidence of reactor vessel head degradation was found, and the repairs were completed, and should prevent future leakage at the affected location. So do you know, were you referring to the places where they found boron, is that what you were referring to?

Mr. Rosenthal: I had read in the internet story, in response to Davis-Besse, in which they listed the reactors which they had found -- I mean, it came from Reuter's, so it is hard to tell what they really were commenting on.

But they had mentioned different reactors around the country, and North Anna was in there, and it said, I think they said 17 or 19 spots of boron degradation. Now, I don't know if it is degradation, or –

Mr. Kugler: Right. This report doesn't list how many, but it does indicate there were places where there were boron deposits, but there wasn't any sign of where it actually corroded. That is the report that we received.

Mr. Cameron: And I think those are the facts in that report, and the term used was deposits. Okay, thank you.

Was there anybody else who wanted to make a statement before we adjourn?

(No response.)

Mr. Cameron: We are going to be here tonight at 7 o'clock for a meeting, open house at 6 o'clock, for those of you who might want to talk with us.

But thank you for concern, comments, detailed comments, your questions are always important for us to heed the admonitions about the credibility of our program. And so we thank you all. And we will be here at 7 o'clock. We are adjourned.

(Whereupon, at 3:25 p.m. the above-entitled matter was concluded.)

Transcript of the Evening Public Meeting on June 25, 2002, in Louisa, Virginia

[Introduction, Mr. Cameron]
[Presentation, Mr. Tappert]
[Presentation, Mr. Tabatabai]
[Presentation, Mr. Kugler]
[Presentation, Ms. Hickey]

NAD-M Mr. Barnes: Good evening. I'm Fitzgerald Barnes, I represent the Patrick Henry District, in the Louisa County Board of Supervisors. This is my second term.

Without a doubt, when you talk about the term that we all hear, on commercial, like a good neighbor State Farm is there, you can use that with Virginia Power.

NAD-M-1 Never had a case where we didn't look to an answer they had where we didn't get it. Their employees, without a doubt, the volunteer hours that they put in this community, is not duplicated at all by anybody.

We had a playground, a park that we tried to get up and running, and their volunteer staff went over there, and their employees went over there and made it a reality where kids could go over there and have an opportunity.

NAD-M-2 But that is just the tip of the iceberg, some of the things that they do here. The library, they contributed funds, and things of that nature, in the community.

From an education standpoint, being a rural county we would not enjoy the things that we enjoy from an educational standpoint, without Virginia Power.

I'm very proud of our school system, of the technology that we have here. Those things we
NAD-M-3 get from Virginia Power. But most of all is the openness that Virginia Power has brought.

If something happens, as an elected official, I get a phone call. I don't read it in the paper first. Somebody from Virginia Power makes sure that we know first-hand anything that we need to know.

And a lot of companies don't do that, a lot of people can't say that. And I'm very, very proud that we have them here as a neighbor.

NAD-M-4 From an economic standpoint a lot of families enjoy a good quality of life because of the employment opportunities here, from Virginia Power. A lot of families would not have the opportunity to make the amount of money they do if Virginia Power were not here.

Sometimes I joke with people and I tell people, I say, we wouldn't be on the map if it was not for Virginia Power in this county. And in fact I was in a meeting the other day and I just realized that we are probably one of the few localities in the state that offer, you go to the landfill free, and things of that nature, don't pay fees, as of right now, and that is because of the tax dollars and things that we get from Virginia Power.

NAD-M-5 So without a doubt, I'm in support of Virginia Power. Like I said before, it is, without effort they always come to our aid, and this is something that they do.

But I'm in support of the application. And if my two cents count, I would like for them to count, and I'm in support of Virginia Power's application.

Mr. Cameron: Thank you very much, Supervisor Barnes. And now we are going to go to Dr. Morgan, who is also on the Louisa County Board of Supervisors.

NAD-N Dr. Morgan: Good evening, I'm Dr. David Morgan, I'm the Supervisor from the Green Springs District here in Louisa County, I work as a radiation oncologist. Basically, I use radiation to treat cancer.

In my previous life in the Navy, where I spent 15 years, I worked as a submarine medical officer, so I had experience with radiation protection, as well, and transferred that to oncology in my private life, after I left the Navy.

Basically, I'm not going to reiterate what Mr. Barnes has talked about in terms of the economic impacts of Virginia Power, I think those are obvious. But I think that safety and security come first, in my mind, and the economic impacts come second.

NAD-N-1 The group at North Anna is probably one of the most professional organizations that I've had the pleasure to work with. These folks really do put safety and security above all else.

They have an operation that has multiple security checks, safety checks, both radiologic and security checks, based on other types of threats. And I think that is important for the community to know.

These folks really have a good quality management, and quality improvement system in place, a lot of checks and balances. The organizations like NRC, regulatory bodies kind of

overlooking, and the oversight committees that look over North Anna really do a good job in making sure that the public in the area is safe.

I think, you know, my personal bias is for nuclear power. I think it has been a proven method of power generation here in the United States. I'm really not going to debate the benefits of it here tonight.

Just to say that of the units in the United States, I think North Anna has one of the best safety
NAD-N-2 records out there. I think they've had an exemplary performance as far as safety and security is concerned, and I would wholeheartedly support their application for their 20 year renewal on their license. Thank you.

Mr. Cameron: Thank you, Dr. Morgan. And next we are going to go to Brooks Besley who is on the Town Council of the town of Mineral, and also on the Planning Commission. And then we are going to get to Mike Schlemmen from Louisa Emergency Services. Mr. Besley?

NAD-O Mr. Besley: Thank you; Mr. Cameron.

I'm here on behalf of the Town of Mineral Town Council. Thank you for this opportunity. The Town and North Anna have enjoyed a very long, very positive relationship. Thirty-four years ago the announcement for this project was made at a meeting in the town of Mineral.

Shortly thereafter Stone and Webster came, set up a field office, lots of employment followed, a lot of jobs. The retail merchants truly enjoyed the impact.

NAD-O-1 But the dollar aspect is probably a type of comment you all hear everywhere. The people at the power plant, the employees there, have set a tremendous standard for us to follow, as far as involvement in the community, their volunteerism.

They -- I recall the first place I was aware of that was the elementary schools had science fairs. They always had folks from the power plant to act as judges in the appropriate areas, and they are very positive, and very significant impact there, brought the image up for our science fair participation.

NAD-O-2 Basically lots of changes taking place in the last 34 years, a very positive impact on our community, our town. We've enjoyed the past 34, and we hope there is another, at least 34. And at that time I hope there is someone here, standing, that says we have had 68, and we want 68 more. It has been very positive. Thank you.

Mr. Cameron: Thank you, very much, Councilman Besley.

Next let's hear from Mike Schlemmen, who is with Louisa Emergency Services. Thanks, Mike.

NAD-P Mr. Schlemmen: Good evening. You are going to have to excuse me. I have been two places at once tonight, I've got two meetings going on at the same time.

My position for the County is the emergency services coordinator. And what that position does is basically provide the locality's response in case there is an emergency for North Anna, or any type of emergency, where we have to declare, where the County Board of Supervisors declares a local emergency.

One thing my experience, and I have been in the field, I'm a fire fighter, plain and simple. I'm the guy that rides in, you saw those folks going into New York, that is what I did for many years. So you are looking at it from a fire fighter's point of view.

I've been in the field for 25 years, I've worked different areas, hazardous materials response has been my last position, with the state, prior to coming to Louisa County.

NAD-P-1 One thing I do have to say about Dominion Generation, or Virginia Power, is that to them safety is job one, it is a concern, they have a very great concern for the community.

And I will explain this to you, because when I first came here, and when I was notified that I -- when I accepted the position here three years ago as emergency services coordinator, the folks from Dominion Generation worked in the same building. They had a representative that worked in the same building with radiological hazmat response.

And when they found out that I was coming up here we sat down, and met, and began to learn the process. To me radiation was, God-awful thing. I began to learn, through education, and the process of what they were discussing, and in my own background, that it is something not to be feared, we can deal with it, and work with it.

And I feel very comfortable with them. They have been a great help to my office. I've taken an office here and we have been slowly growing. A lot of things coming forth. And if it wasn't for the help of Dominion Generation, I don't know where we would be at.

NAD-P-2 I can pick up the phone and call their emergency preparedness people and say, look, I need some assistance, and I will get a phone call back, and get some assistance, and whatever I need.

So I'm very grateful to those folks. Our relationship has grown over the three years. One of the things I do want to advise the citizens of Louisa County, which we have, and you folks in the NRC, is that we had our last drill in December of 2000.

Boy, you talk about being nervous going through that. It was a great deal, I think we had some of the folks from the NRC here. We also had FEMA. It was a graded exercise, and a lot of things ride on that, how the localities respond to a potential incident.

And if we did not do things right it could affect the operation of the plant. So you can say I was put on the hot seat. One of the things that we did before that drill was work with Dominion Generation, work with the Department of Emergency Management in Richmond, held a lot of training, brought our people up to speed. And our last drill, it was the best that Louisa has ever done.

We received no new issues, no new ARCAs, it was just one of those things that occurred, and how well prepared. That plan, we are getting ready to go through this drill July 16th. I will tell you that we have been working constantly on that plan, updating, upgrading it, because our concern is for the citizens right there.

NAD-P-3 Safety is so much of a concern that what we have done in the county, just for your information, is as new developments go up around the lake, within the 10 mile EPZ, we have kind of an informal agreement with the planning office, when a request for rezoning, or putting in a development into the ten mile EPZ comes across the planner's desk, and the Planning Commission, it comes down to my office for a review, we request siren easements.

I think this is one of the only localities in the area, and actually in the state, that has requested siren easements. So if you are going to put a new subdivision up around that lake, we would like to have a place that we can put a siren to eliminate sending people in for alarming, that we can blow that siren, and it frees our people up to do other things.

So these are some of the new initiatives that we've done in working with Virginia Power. And I do have to say it has been a very successful operation.

NAD-P-4 As I said, I'm a fire fighter, dealt with hazardous materials, and environmental impact. I know this is an environmental impact statement. I think dealing with hazardous materials, dealing with the terrorism threat that we've been doing, and one thing that we have been putting into our plan, is dealing with the potential terrorism threat. It is out there.

NAD-P-5 I think the environmental impact of every day hazardous materials that come through this community, I fear are much more greater, than I do the nuclear power plant having a problem.

There is a lot of chemicals, and a lot of things that come through, that can do just as much harm, quicker, than radiation from the power plant. So we are preparing ourselves for everything in all categories.

We have major interstates and railroads that go through here every day. And one thing I can rely on is the expertise, and the assistance of Virginia Power to assist us in those areas also.

So I just wanted to give you a little perspective of emergency services. Thank you.

Mr. Cameron: Thank you, very much, Mike.

It is always useful to hear from the company in terms of the rationale for the license renewal application, and some of the details behind that. And we are going to have Jack Davis, who is the director of nuclear safety and licensing, at the North Anna Station, talk to us.

And then he is going to introduce Jud White, who is over here, as the environmental manager for Dominion. And then we are going to go to some citizens in the community who have signed up to speak. Jack?

NAD-Q Mr. Davis: Thanks, Chip. Good evening, ladies and gentlemen. As Chip said, I'm Jack Davis, and I'm the director of nuclear station safety and licensing at North Anna Power Station.

I would like to take this opportunity to thank the Nuclear Regulatory Commission for holding this important meeting to receive public comment on the NRC's supplemental environmental impact statement that supports Dominion's application for license renewal for North Anna Power Station.

We welcome the public comment process, and we believe that Dominion, Louisa County, and other nearby communities all have a stake in the future of North Anna Power Station.

NAD-Q-1 As an employee of Dominion I'm excited about the license renewal for North Anna. A renewed license would not only be important to Louisa County, and Virginia, but also to me and 852 other North Anna employees, whose livelihood depends upon providing safe and reliable electricity to the customers of this state.

NAD-Q-8 That is not to mention the future employees that will be required to continue the safe operation of the plant well into this century.

NAD-Q-2 Currently North Anna provides about 17 percent of the electric power used in Virginia. A renewed license would ensure that we could continue to provide that safe, reliable power, to our customers.

NAD-Q-3 Additionally, renewed licenses would assure the local community that it will continue to reap the benefit of having a large employer in the area, and Louisa County would continue to receive the tax revenue from the station's operation.

NAD-Q-9 Just as an aside, North Anna Power Station has provided 170 million dollars in tax revenue to Louisa County since the station started building some 30 years ago.

I would like to digress for just a moment, and tell you a little bit about myself, and how I came to be associated with North Anna Power Station. I began my professional life in the nuclear Navy, during which time I had the pleasure of three tours as commanding officer -- first of the USS Baton Rouge, a nuclear powered attack submarine, then the Navy's three reactor training facility, near Idaho Falls, Idaho. And last, the USS L.Y. Spear, which is a nuclear submarine repair ship.

I joined Dominion in the fall of 1997 as the assistant superintendent of outage and planning. And in the summer of 1999 I entered the senior reactor operator license class, and received my license from the Nuclear Regulatory Commission in October of 2000. In November of that same year I assumed my current duties at the station.

NAD-Q-4 North Anna Power Station has a long history of safe, reliable, and efficient operation. Since the 1990s North Anna has consistently ranked as the most efficient producer of nuclear generated electricity in the United States, on a three year cost average.

The station has also achieved, and continues to achieve, high marks in safety and security performance from the Nuclear Regulatory Commission, and from the Institute of Nuclear Power Operations.

During the period 1993 through 1997, the Nuclear Regulatory Commission, in its oversight program, then known as the systematic assessment of licensee performance report, graded North Anna as having superior safety performance in all station functional areas.

Under the NRC's new reactor oversight process, the results of which are updated quarterly, on a quarterly basis, on the Commission's website, North Anna continues to fully meet the NRC safety cornerstone objectives.

Additionally, since 1991, the Institute of Nuclear Power Operations has also consistently awarded North Anna its highest marks for nuclear safety and operational excellence.

As to environmental performance, our commitment to environmental stewardship dates back to the construction days of the power station in '60s and '70s. North Anna Power Station was designed so that the water that is used to cool the steam that generates electricity, discharges into an innovative 3,400 acre system of lagoons that returns the water to Lake Anna at nearly normal temperatures.

NAD-Q-5 We also have a conservation effort that focuses on protecting and enhancing fish populations in the lake. Special structures of brush and cinderblocks were constructed and sunk in the lake to improve the fish habitat.

Our biologists regularly sample, or monitor the health of the fish population. And that data is compared with data that was taken prior to our first day of operation.

These comparisons have consistently shown that North Anna Power Station is not harming the lake's fish population.

NAD-Q-10 In preparing North Anna's relicensing application more than 50 individuals have spent, literally, thousands of hours reviewing all environmental aspects of continued plant operation.

The report concluded that continued operation of North Anna Power Station beyond 40 years will not negatively impact the environment surrounding the plant.

In a moment Dr. Jud White, Dominion's manager of environmental policy and compliance, will share with you more about our environmental programs, and review the findings of the NRC draft report.

Finally, I would like to thank you all on behalf of Dominion for allowing us to do business in
NAD-Q-6 Louisa County. We strive to be a good corporate citizen, and have enjoyed the professional supportive working relationship that we have with the county, and the other local communities surrounding the station.

NAD-Q-7 As many of you know, Dominion has a long-standing tradition of investing in the communities it serves through volunteer and philanthropic activities. Many of our employees demonstrate their commitment to the community by participating in programs such as Adopt a Highway, Thanksgiving Baskets for the Needy, blood drives, supporting the area Boy Scouts, and many other community activities.

Our volunteer programs and civic participation are an essential element of Dominion's corporate philosophy. We will continue our commitment to our communities in the future.

Again, I appreciate the opportunity to speak to you about North Anna Power Station's license renewal. I would now like Jud White, if he would provide you some more details on the environmental aspects of our application. Jud?

NAD-R Dr. White: Thank you, Jack. As Jack said, my name is Jud White, I'm the environmental manager at Dominion, with responsibilities for environmental compliance activities at all of our power stations in Virginia, as well as other states. But it also includes the North Anna Power Station.

I have over 25 years experience in the environmental field. My first ten years of my career I spent at North Anna, with responsibilities for studies, environmental studies in the lake, as well as the downstream North Anna River.

I do have a master's degree in Biology, and a PhD in environmental policy. I was directly involved and helped in assisting the Dominion nuclear team, helping them prepare the license renewal application to NRC. And, in particular, I helped develop the environmental report to the NRC, and coordinated with Federal and state environmental agencies.

NAD-R-1 We commend the NRC in developing what is, in my opinion, a high quality and professional draft supplemental environmental impact statement. The impact statement is a thorough, in my opinion, and accurate scientific assessment of the potential environmental impacts associated with the proposed action.

NAD-R-2 We support and agree with the conclusions of the NRC Staff that renewing the North Anna Power Station operating license is a reasonable action that will not result in any noticeable impact to the environment.

Basically this means, as has been said several times already, that the license renewal option is preserved, or remains acceptable for the power station to continue to provide safe and reliable, and clean electricity to the Commonwealth of Virginia.

We prepared, over a several year period, and submitted to the NRC an extensive environmental report for license renewal that was part of the information used by NRC in developing their supplemental environmental impact statement.

I say in part because it was just one area where the NRC relied on information. They had other sources including what was mentioned earlier, the Generic Environmental Impact

Statement, the extensive consultation with Federal, state, and local authorities, and environmental agencies, independent review by the NRC Staff, National Laboratory consultants, and the consideration of the public during the scoping process, which was held last fall, here.

Of particular note, relative to information sources, Dominion proactively engaged in discussions and meetings with key state, Federal, and environmental agency staffs very early in the license renewal process.

This helped ensure that all issues were identified and appropriately addressed in the environmental review submitted to NRC. Dominion also proactively communicated with environmental and other pertinent stakeholders about license renewal.

This helped considerably, in my opinion, in the development of a thorough and accurate report. The report speaks specifically, and it has been mentioned somewhat previously, about specific impacts to fish, various aquatic resources, and is listed in detail in the report.

The report goes back to studies that began in the early '70s, even before the plant went operational. The creation of Lake Anna, a key point for this area, it created by damming up the North Anna river, it created Lake Anna, which is a 9,600 acre impoundment.

It basically ameliorated the effects on the communities downstream from Contrary Creek, which is a known source of acid mine drainage in the area. And as a result of impounding the river, and creating the lake, that impact was greatly reduced.

Also many of you who are fishermen probably are well aware that Lake Anna continues to rank high in the state as a trophy bass lake in Virginia, which is a clear indication that the underlying food chain, on which it depends, is healthy and stable.

NAD-R-3 Based on the review of all of the historical information, including the annual monitoring, which does continue today, the NRC concluded that potential impacts to aquatic operations are small, and that additional mitigation is not warranted, and we do agree with that finding.

To work with the NRC in evaluating the current applicability of the generic environmental impact statement, that information in it, as it pertained to generic issues, requiring no further review, Dominion developed an internal procedure, and protocol, to identify any new and significant information related to those issues that NRC identified as generic.

NAD-R-4 As a result of that process no new information was identified, but we did go through the process, as it was important to do. This activity is considered very important, in my opinion, in

all license renewal projects for verification of the findings in the generic environmental impact statement.

We also agree with the NRC findings that the potential impacts of license renewal for the remaining environmental issues evaluated separately in the impact statement are small, and of noteworthiness is that a significant consideration is that there is no new major construction or land disturbing activity associated with this license renewal process.

As a result a lot of the impacts were considered small. In essence current measures to mitigate environmental impacts associated with operations were found to be adequate.

Dominion, and its entire staff, its entire environmental staff, takes pride in its environmental performance, and its positive relationships with environmental agency staffs, environmental organizations, the general public, and community neighbors.

It goes without saying that developing that relationship takes time to foster, as well as a major commitment by upper management for openness and candor, which I'm proud that we have.

Examples of these relationships that we have with the various groups and organizations, including the Department of Environmental Quality, the Virginia Department of Game and Inland Fisheries, Lake Anna Civic Association, as well as Lake Anna Advisory Committee, and the River Association.

In this license renewal process we want to ensure that we continue on this path, and not do anything adversely impacting our future performance or relationships with these groups.

Dominion believes that our obligation to provide safe and reliable energy from nuclear power extends well beyond this license renewal milestone. Federal, state, and local oversight will continue to test and challenge, just as it does today, our standard of environmental excellence, and the conduct of our daily business.

We welcome all comments on the contents of this supplemental environmental impact statement, during the comment period, and we look forward to working positively and constructively with NRC staff. Thank you.

Mr. Cameron: Thank you, Jud. Next we are going to go to Ione Dusinberre, and then to Marione Cobb. And, Ione, would you mind coming up to the microphone for us?

NAD-S Ms. Dusinberre: My name is Ione Dusinberre, I live in Louisa County, the Mineral district.

NAD-S-1 I particularly enjoyed hearing North Anna's mention of aging. The 20 years I've been here, so 20 years North Anna has been here. Pretend this is a tin can stress, stress, stress, stress. North Anna has undergone 20 years of stress.

What happens? Fatigue. I'm very fearful that we will have another Chernobyl here. Everywhere you go you hear, it couldn't happen here, it couldn't happen to me. All kinds of accidents, it wouldn't be me, couldn't be me.

NAD-S-2 North Anna has been a fantastic provider of safety. But what if we put the thousands of hours that you put in, what if we put it into alternative sources?

If we give a thought to something different, wouldn't we have a beautiful future?

Mr. Cameron: Ione, thank you very much. Marione, are you ready?

NAD-I Ms. Cobb: Good evening, I'm Marione Cobb, a semi-retired former social worker. I live,
NAD-I-2 currently, here in Louisa County. And like Ione, I see the beauties of alternative energy compared with a life threatening continuation of the nuclear energy plant.

We've heard many people address this evening the, let's see, I'm just glancing through my notes, the 50 individuals, thousands of hours that have gone into studying the safety issues, and evaluating them, looking at the larger picture.

This is because there is a basic threat in the operation of this plant, here in our county, and
NAD-I-3 anywhere, everywhere, in this country. If we had given the supports, the financial incentives to alternative energy that we've given to the nuclear industry, we would not be currently living with the threats that, for instance, the nuclear waste disposal brings, effectively to our doorstep if the North Anna plant is going to be transporting toxic waste.

And, of course, that is now before the Senate, there is the veto from the Governor of Nevada has been overridden in the House, and the Senate is now considering approving Yucca Mountain. And, of course, there seems to be little alternative.

NAD-I-4 Where else do we want this toxic waste to sit, as it is at North Anna, in the caskets, casks I should say, but maybe caskets is more appropriate, and be subject to the effects of weather, the effects of time, it is a sitting time bomb, in my estimation.

Again, I'm glancing at my notes. Louisa is -- gets -- has gotten ten million dollars in taxes. Mr. Root, I believe, stated that it has raised us from one of the poorest counties in Virginia, to our current standard of living here.

NAD-I-5 We have good schools, we have good roads. This is a terrible choice for our Board of Supervisors, and other public servants, because they see the benefits of this money, they see the benefits of the philanthropy that the power plant employees have given to the county, and to our children.

NAD-I-6 Nevertheless, as a concerned citizen I look at the larger picture, I believe, and see that the threat continues to exist. I think , as I already stated, that if we put the monies that we put into nuclear energy into alternative energy, we would not have to live with this threat.

NAD-I-7 The cost of nuclear power is borne by taxpayers in general, as well as by rate payers. The nuclear waste costs are insufficient to be covered by funds set aside for disposal and decommissioning of plants. More waste, another 20 years, or however many years, means more taxes, perhaps hidden taxes.

It is hidden from us, nuclear energy has in the past often called itself cheap, safe, economical.

NAD-I-8 There are taxes going to support the plants, and to support the decommissioning, enormous amounts of money. Nuclear energy is not economical.

I believe the facility was designed, it was stated that some systems in the facility were

NAD-I-9 designed for the current licensing length. Mention has been made of the aging process issue. And the many attempts that have been, that are being made to address it. There is also repetition of a phrase, cost beneficial. So we are not going to have a new plant, we are going to look at the cost beneficial aspects in replacing older items.

As a former resident of New York state I'm sure, I remember and you, of course, undoubtedly remember the crash of, was it a Boeing 747, on Long Island? And they said, something must have aged, something must -- we didn't count on that, that was entirely unanticipated. It was not terrorists, it was an aging piece of equipment.

NAD-I-10 We've seen, recently, at the Davis-Besse plant in Ohio, that aging parts can be a route to catastrophic failure, without warning. Extension of the license of this plant increases the danger to our community.

NAD-I-11 And we are, of course, hearing about the churches, the schools, the homes, that the nuclear waste casks will pass by, if and when transported to Yucca Mountain. A constant threat to my, and I believe to your, well-being. Thank you.

Mr. Cameron: Thank you very much, Marione. And next we are going to go to Adriane Dellorco.

NAD-K Ms. Dellorco: Hi, I'm Adriane Dellorco. I'm an environmental studies student at Oberlin College in Ohio. And listening through the discussion of this environmental impact statement I see three things missing from this conversation.

NAD-K-3 One primary thing is that in all the analysis of the environmental impact that the shipping, and the toxic waste storage was never looked at, and I think that is a major piece of this puzzle, that we are basically shipping off our dangerous and threatening waste off to somewhere else, so that someone else can deal with it.

NAD-K-4 And we reap the benefits of having, you know, greater taxes in our area. And so I would like to think about what if we were the community where this waste was being shipped?

NAD-K-5 And the second part of this that I see is that the analysis said that other alternatives to nuclear power show moderate to some -- some alternatives show moderate to large impacts while the nuclear power shows small impacts.

But does it also point out that other impacts, do other alternatives do show probably even smaller impacts to the environment, such as wind, solar, and hydropower? That was also somewhat omitted from this conversation.

NAD-K-6 Third, most people that are supporting the nuclear power plant are touting the economic benefits to this community. And, to me, that just exemplifies an environmental injustice, in which communities of lower income have been historically placed as sites for nuclear power plants to create a dependency upon the nuclear power plants by providing it with money, and community service.

And so I would just like to point out that we are continuing this dependency that has already begun, and I think it is an unhealthy one.

Mr. Cameron: Adriane, thank you for those comments. We have two final speakers, or two remaining speakers, I should say. One is Mr. Gerald Root, who I would ask -- do you want to come down -- why don't you come down? That is good. And then we have Mr. Dick Clark, after Mr. Root.

NAD-J Mr. Root: I'm Gerald Root, I've been a permanent resident on cooling ponds for ten years. And during that ten year period we worked with a lot of different situations on the lake, addressing the problem that cropped up in the early 1990s, and seeking solutions for how to resolve that, studying the total watershed, working on a special area plan.

And in the course of that I went through the original environmental impact statement that was produced probably before the 1970s, at least before the plant existed.

And while there was a lot of good research in there, there was a degree of speculation because there were no facts. Let me give you one small example.

NAD-J-2 There was concern on the cooling ponds about the fish. And that slightly higher temperatures would have very adverse effects on them. Well, after 30 years of operation we now have facts. And I hope that they go into this environmental impact statement in a factual way.

I appreciate what these three ladies have said here. But it would be even stronger if it could
NAD-J-3 be backed up by hard facts. How many people have died in the United States as a result of radiation from nuclear production?

Now, I know what happened over in Russia, but let's address it here in this country. Those kinds of facts, I think, would help people reach a more reasonable conclusion in terms of the course of which is the right direction to go.

NAD-J-4 I personally would favor relicensing for an additional 20 years. Thank you.

Mr. Cameron: Thank you very much, Mr. Root. And now we are going to hear from Mr. Dick Clark. Dick?

NAD-T Mr. Clark: It is good to see some familiar faces here. Where are some of the others from central Virginia, by the way, tonight here? Well, I guess they should have come.

Well, my name is Dick Clark, and I'm a resident here, just like Gerald. I'm also president of the Oak Ridge Civic Association, real active in the Lake Anna Civic Association, and particularly on the Water Quality Committee, where we are evaluating and assessing the water quality here in the lake and in the tributaries.

Well, first of all, my background. I think I have a little bit of experience in this, only 50 years in the nuclear field, frankly, as a nuclear engineer. I recently retired from the NRC, but long before that I was with the Atomic Energy Commission, before that I was designing production reactors. I was even one of the principal designers of a reactor you probably don't even know about, a 10 megawatt pressurized water reactor at Ft. Belvoir, which is still standing, the fuel has been removed, but it is still there.

I also worked on the design of the Nautilus. Again, I have been the senior project manager responsible for the issuing the construction permits for many of these plants, and the operating licenses for some of the early reactors, after NEPA came into effect.

Believe me, I prepared a good many final and draft environmental statements, and multi-million dollar statements, teams of 15, 20 terrestrial and aquatic ecologists, and what not.

I have a wee bit of a background, I think, in environmental science, and still working in that field. As I say, I was the senior project manager. I didn't actually license at North Anna. I did get involved in the environmental assessment that we issued for that.

I didn't bring a copy with me, but I have it with me. I've also, some of the more recent plants, as you know, like Limerick Unit 2, April 29th, 1989.

Now, you were talking about spent fuel, and that sort of thing. I was also one of the original environmental project managers assessing the storage of spent fuel on site, and testified at many hearings.

We started storing spent fuel, actually, out at spent fuel pools on-site back in 1975. And some of the real contested hearings we had were places like Vermont Yankee, and what not.

This spent fuel, after it has been stored for five years underwater, you can take it off-site and just store it in the air with just some shielding around it. And that is what we did, for instance, the Army had a plant at Ft. Greeley, Alaska.

And the spent fuel we just took out in the yard and put concrete culverts around it for radiation shielding. It is absolutely perfectly safe. These shipping casks you are so worried about, they are designed for fires, for dropping on hard concrete surfaces, on a pin. Try and destroy them, I defy you to try and destroy them.

Besides which that spent fuel, sure, it is radioactive. But you can't do anything with it, you can't get at it and what not. Really, actually, we figured back in the mid '70s, it was really just as safe to store the spent fuel at all the nuclear plants forever, outside in the yard, but Congress decided otherwise, decided to ship it out to Yucca Mountain, but that is their decision.

NAD-T-1 And the bottom line is, I won't take you up any more, Chip, but I strongly recommend it. I mean, I reviewed this, the environmental statement, I reviewed the procedure.

One other thing, too, back 10 years ago, back in 1992 we required all these plants, like North Anna, to prepare an environmental, individual plant examination. You are familiar with those, Andy, the IPEs.

I was in charge of reviewing those. I was shipped over to research to review those. And I specifically reviewed the North Anna one, among others. Believe me, the North Anna, you know their operating record, one of the safest plants insofar as operating, and management, and all that.

I will tell you one other thing. On these "what if" statements, the IPEs, and all that, we were evaluating everything that might possibly happen. Sure, it was steam generator break, and that, small break LOCA, you name it, a hurricane blowing a telephone pole in at 150 miles an hour.

NAD-T-2 North Anna is one of the best designed, safest plants in this country. And I will tell you that, I know, because I've done the reviews on it. It is really one of the safest and best designed plants in this country.

And I have reviewed just about all of them, under the IPEs. And I think I'm talking about some personal knowledge of what the design of this plant is. And believe me it is safe to operate for another 20 years, and I strongly urge the NRC to renew the operating license for another 20 years.

Chip, thanks very much for letting me, sorry to take up so much time on this. Good to see you again.

Mr. Cameron: It is nice to see you too, Dick, and thank you for those comments. It is always nice to see a former colleague.

Mr. Clark: These lawyers are always the nemesis --

(Laughter.)

Mr. Cameron: And there is going to be, there is going to be another meeting after this where Dick is going to tell us more about that.

But, seriously, thank you all for coming out tonight and talking to us. Eva, do you have one clarification for us?

Ms. Hickey: Yes, I'm sorry, I have to apologize. On the question about high level waste issues, I'm getting my projects confused. I've been working on another Generic Environmental Impact Statement.

In fact NUREG 1437 does evaluate the disposal and the transportation of spent fuel. And those were found to be category 1 issues. So we did look at those, and those are addressed in the uranium, in the fuel cycle, in chapter 6.

So I apologize for that.

Mr. Cameron: You had better tell us what NUREG 1437 is.

Ms. Hickey: That is the environmental impact statement.

Mr. Cameron: That is the Generic Environmental Impact Statement?

Ms. Hickey: For license renewal.

Mr. Cameron: That is the generic statement that this site specific draft is a supplement to that generic statement?

Ms. Hickey: Yes.

Mr. Cameron: Okay, good, I'm glad we got that on the record.

Ms. Hickey: I apologize for that.

Mr. Cameron: Well, thank you, thank you all. We are going to consider these, and evaluate these comments in preparing the final EIS.

And, please, NRC staff, you've heard some of the comments tonight, please -- and our expert consultants from the labs, please take some time to talk to some of the people, if they have time to stay, about some of these issues.

Thank you, all right, we are adjourned.

(Whereupon, at 8:50 p.m. the above-entitled matter was concluded.)

Letter 1, page 1

NAD-U

From: David G Schwartz [davidgs2na.gemlink.com]
Sent: Saturday, July 27, 2002 12 18 PM
To: NorthAnnaEIS2nrc.gov
Subject: relicensing

NAD-U-1
NAD-U-2

NAD-U-3

I disapprove of the relicensing of the North Anna nuclear plant when the current license expires We need to phase out all nuclear power plants because it is highly irresponsible for our generation to create the nuclear waste that generations thousands of years to come will have to continue to monitor long after our civilization has died out This is playing God on a grand scale in an area where we have no business treading Nuclear power is ethically untenable and morally reprehensible We needed to have the technology for handling nuclear waste perfected decades ago before the first plant was ever built Most of the electrical energy we use is wasted Strict conservation wind hydroelectric, solar and geothermal could be adequate for our energy needs if we put a fraction of the financial resources into research for them that has been put into nuclear energy Sincerely David G Schwartz, M D

Letter 2, page 1

Virginia Electric and
Richmond, Virginia

July 30,

Chief
Rules and Directives Branch
Mail Stop T 6D 59
United States Nuclear Regulatory Commission
Washington, DC 20555 0001

Gentlemen

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
RESPONSE TO REQUEST FOR COMMENT ON THE DRAFT PLANT SPECIFIC SUPPLEMENT 7 TO THE GENERIC ENVIRONMENTAL IMPACT STATEMENT

In a letter dated April 19, 2002, the NRC provided Virginia Electric and Power Company (Dominion) A draft supplement environmental impact statement (SEIS) regarding license renewal of North Anna Power Station, Units 1 and 2 This draft SEIS is the draft plant specific Supplement 7 to NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants and was provided for review and comment Attached are our comments on the draft SEIS

Dominion considers the draft SEIS to be an accurate and factual representation of the environmental conditions associated with plant operation during the license renewal period Furthermore, we concur with the conclusions of the NRC that any environmental impacts associated with license renewal would be of small significance and that any adverse environmental impacts of license renewal would be smaller than those of other reasonable energy alternatives Dominion specifically concurs with the NRC's plant specific discussions and conclusions presented in the draft SEIS

Should you have any questions regarding this submittal please contact Mr J F Wiedeman at (804) 273 2186

Very truly yours

Leslie N Hartz
Vice President Nuclear Engineering

Attachment

Commitments made in this letter None

Attachment

License Renewal – Response to Request for Comment
Draft Plant-Specific Supplement 7 to the GEIS
Serial No 02-320

North Anna Power Station, Units 1 and 2
License Renewal Application

Virginia Electric and Power Company
(Dominion)

NAD-V-1

[redacted]

Section 1 5 Compliance and Consultations

Page 1 9 Line 8

Draft GEIS Statement

Table 1 1 indicates that the US Fish & Wildlife Service Migratory Bird Treaty Act Permit expired December 31 2001.

Dominion Comment:

Depredation Permit Number MB705136 0 was renewed effective 4 22/02 and expires 3/31/03 It is suggested that this update be reflected in Table 1 1.

NAD-V-2

[redacted]

Section 2 1 5 Non-radioactive Waste Systems

Page 2 12 Line 34

Draft GEIS Statement

The statement is made that "An onsite solvent shop recycles paint"

Dominion Comment:

The following correction is suggested as a replacement "An onsite paint shop recycles solvent"

NAD-V-3

[redacted]

Section 2.1 5 Non-radioactive Waste Systems

Page 2 13, Line 2

Draft GEIS Statement

The statement is made that "Non-radioactive liquid waste produced (e g water treatment activities, stormwater runoff, housekeeping wastes) are sampled and treated

Dominion Comment.

The statement is not accurate without exception It is suggested that "housekeeping wastes" be deleted from this statement since there are waste disposal processes in which not all "housekeeping wastes" are sampled

[redacted]

Section 2.2.3 Water Quality

NAD-V-4

Page 2-17, Line 29

Draft GEIS Statement.

It is stated that "The US EPA has authorized VDEQ to implement NPDES within the State"

Dominion Comment

It is suggested that the statement read "The US EPA has delegated implementation of NPDES to VDEQ within the Commonwealth of Virginia," to reflect the actual federal-to-state relationship

[redacted]

Section 2.2.4 Air Quality

NAD-V-5

Page 2-18, Line 14

Draft GEIS Statement.

It is stated " the annual average wind power rated as 1 on a scale of 1 to 7 (Elliott et al 1987)

Dominion Comment.

It is suggested that the following words be inserted " on a scale of 1 to 7, with 1 being the lowest " prior to the reference callout

[redacted]

Section 2.2.5 Aquatic Resources

NAD-V-6

Page 2-22 Lines 21-22 Table 2.2

Draft GEIS Statement

The slippershell mussel (Alasmidonta viridis) is given as a Federal listed species

Dominion Comment.

Based on a 2002 review of the Virginia Fish & Wildlife Information Service web site for the slippershell mussel this species only occurs in the extreme western part of the Commonwealth of Virginia. It is not considered to occur in streams in counties adjacent to Lake Anna, immediately upstream or downstream North Anna River, or in counties crossed by North Anna transmission line corridors Table 2-1 of the License Renewal Application Environmental Report does not list this species as a species of concern and the description of this species within the SEIS implies it is of potential concern for the area in which North Anna Power Station is located It is therefore requested that this species be deleted from the SEIS

[redacted]

Section 2.2.6 Terrestrial Resources

NAD-V-7

Page 2-24 Table 2-3 and Page 2-25, Lines 4-7.

Draft GEIS Statement

The sensitive joint-vetch is listed in Table 2-3 and discussed on Page 2-25 yet stated "it is not known to occur at North Anna or the transmission line rights of way"

Dominion Comment

Based on a review of the Virginia Fish & Wildlife Information Service web site for the sensitive joint-vetch, this species is only located along tidally-influenced fresh waters This is not the case for North Anna near Lake Anna nor for any transmission line corridors for North Anna Power Station The description of this species within the SEIS implies it is of potential concern for the area in which North Anna Power Station is located It is therefore requested that the listing and discussion of this species be delete d from the SEIS

[redacted]

Section 2.2.8.1 Housing

NAD-V-8 Page 2-28, Line 50

Draft GEIS Statement:

It is stated that "Louisa County is currently updating its plan (VEPCo 2001b)

Dominion Comment.

Louisa County approved an updated Louisa County Comprehensive Plan in September 2001, referenced on Page 2-51 Lines 33-34 This statement should be updated accordingly

[redacted]

Section 2.2.8.1 Housing

NAD-V-9 Page 2-30, Table 2-7:

Draft GEIS Statement:

Table 2-7 is titled "Population Growth 1980-2010" Population data includes Richmond City & County

Dominion Comment:

It is suggested the title read "Estimated Population Growth." Population data given in Table 2-7 varies from the License Renewal Application Environmental Report due to the inclusion of Richmond City & County Richmond County is not located in the population zone for consideration

[redacted]

Section 2.2.8.2 Public Services, Water Supply

NAD-V-10 Page 2-30 Lines 21-22

Draft GEIS Statement:

It is stated that Henrico County provides water to approximately 80,215 customers

Dominion Comment:

The License Renewal Application Environmental Report stated 74,000 customers, and the Draft SEIS references the ER We cannot substantiate the source of the SEIS number and suggest that the number be revised to reflect the LRA ER identified number of customers, or the source of the SEIS number specified

[redacted]

Section 2.2.8.2 Public Services, Water Supply

NAD-V-11 Page 2-30, Line 30

Draft GEIS Statement:

It is stated that the maximum capacity of the City of Richmond is 128 MGD

Dominion Comment:

The License Renewal Application Environmental Report stated the maximum capacity at 132 MGD. We cannot substantiate the source of the SEIS number and suggest that the number be revised to reflect the LRA ER number, or the source of the SEIS number specified

[redacted]

Section 4.6.1 Aquatic Species

NAD-V-12 Page 4-42, Line 23

Draft GEIS Statement:

It has been determined that impacts ". . would be SMALL."

Dominion Comment:

It is requested that the following words be added to the above sentence to be consistent with Endangered Species Act wording and Surry Draft SEIS conclusion statements "... would be SMALL and would not be adversely affected ..."

[redacted]

Section 4.7.1 Evaluation of Potential New and Significant Information Received from the FWS Chesapeake Bay Field Office

NAD-V-13 Page 4-4-1, Lines 24-27

Draft GEIS Statement

It is written that the NRC staff will inform VEPCo of comments provided by FWS and recommend further dialogue

Dominion Comment:

It is requested that this statement be changed to reflect recent discussions regarding this issue and the final course of action as determined by the NRC staff. We recommend that the April 30, 2002 correspondence from NRC to FWS be referenced for completeness.

[redacted]

Section 5.2.6.1 VEPCo Evaluation

NAD-V-14 Page 5-22, Line 32

Draft GEIS Statement

There is a "?" provided in the APE formula

Dominion Comment:

The question mark "?" should be a "delta symbol" in the APE formula

[redacted]

Section 5.2.6.1 VEPCo Evaluation

NAD-V-15 Page 5-23, Line16

Draft GEIS Statement.

It is written that "This higher value is primarily due to the high frequency of SGTRs ..."

Dominion Comment.

It is requested that the words "frequency of" be replaced with "contribution to CDF from"

[redacted]

Section 8.2.3.1 Once-Through Cooling System

NAD-V-16 Page 8-35, Lines 24-35

Draft GEIS Comment:

It is written that "Approximately 200 ha (500 ac) would be needed for the construction of the new plant."

Dominion Comment:

Since the initial Final Environmental Statement for North Anna Power Station was written for four units, it should be summarized that no additional land may be needed for construction of a new plant.

[redacted]

Section 9.1.2 Irreversible or Irretrievable Resource Commitments

NAD-V-17 Page 9-6, Lines 20-21

Draft GEIS Statement:

It is written that "The most significant resource commitments related to operation during the renewal term are the fuel and the permanent storage space."

Dominion Comment:

It is our presumption that "permanent storage space" refers to a national repository In light of recent federal government actions regarding spent fuel disposition it is requested that this statement be changed to reflect federal direction, and add the word "offsite" to the phrase "permanent storage space" to be consistent with the phrase "permanent offsite storage space" in Line 18

July 24 2002

ER 02 407

Chief Rules Review and Directives Branch
U S Nuclear Regulatory Commission
Mail Stop T6-D59
Washington DC 21555 0001

Attention Andrew Kugler

Re NUREG-1437 Draft Supplement " to the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants - North Anna Power Station Units 1 and 2

Dear Sir

The U S Department of the Interior (Department) has reviewed and offers the following comments on the referenced draft document Please give these comments careful consideration in completing the final Supplement

General Comments

The Department shares a common goal with the U S Nuclear Regulatory Commission (NRC) to bring the North Anna Nuclear Power Station into compliance with current environmental regulations To this end a representative of the U S Fish and Wildlife Service s (FWS) Chesapeake Bay Field Office visited the site on May 21, 2002 to help the NRC identify, assess avoid and mitigate any adverse environmental impacts With the advances in human understanding of ecological relationships, it is appropriate and useful that Federal and state natural resource agencies periodically review site conditions in order to maintain the highest level of environmental protection Since the North Anna Power Station came online in 1978, Dominion Energy Company (parent company of Virginia Electric and Power Company) and the NRC have initiated measures for the protection of the natural resources around the Power Station lake, and river areas

NAD-W-1 *The FWS has determined that the North Anna operations and minor refurbishment may have potential to adversely affect area natural resources. The federally threatened bald eagle, Haliaeetus leucocephalus, does not appear to be affected, but a scientific approach should be maintained to evaluate and document any mortalities. Similar records for other migratory bird impacts should be maintained and any mortality reported to the FWS.*

NAD-W-2 *Regarding aquatic species, potential impacts include the cooling water intake, discharge, and dam that provide the impounded cooling water. The rotating screens of the cooling water intake at the Power Station provide nearly unimpeded water intake, but the biota are likely to incur high mortality as a result of entrainment and impingement. There is probably less mortality associated with the cooling water discharge, but the effects on fish behavior and ecology are potentially damaging. Another fisheries impact is the Lake Anna Dam. While downstream fish passage may be acceptable, the blockage of upstream migrations of anadromous and possibly amphidromous fish during high flow seasons, should be corrected during this relicensing. The FWS offers the following comments on topics where the environmental standards have improved and new information is available.*

Specific Comments

NAD-W-3 *The FWS agrees that the potential is low for the North Anna Power Station to adversely affect the bald eagle, a federally threatened species. Our primary concern is for the incidental mortality to migratory birds associated with the transmission lines. In the event of migratory bird mortality, Virginia Electric and Power Company should complete a Raptor Incident Report for the FWS and the appropriate state agencies.*

NAD-W-4 *The North Anna facility lacks a component of the cooling water intake system that Virginia Electric and Power Company has developed at the Surry Power Station. The traveling mesh screens at the Surry Power Station include a spray wash system that removes the biota from the screens and returns them to the James River. The North Anna facility utilizes a similar technology for the screens, but fails to provide the mechanism to return the biota impinged back to the Lake. The traveling screens and wash system at Surry clearly minimize aquatic impacts more than the North Anna facility, which discards the impinged biota into a disposal bin. A similar process, such as at Surry, could be developed to minimize the aquatic impacts by returning the impinged biota safely back to the Lake. To further minimize the impacts, we recommend replacing worn or damaged screens with mesh less than or equal to one millimeter wide and adopting entrance velocities less than or equal to 0.5 feet per second (Gowan, C. and G. Garman 1999).*

NAD-W-5 *The cooling water discharge is an additional potential hazard to fish. Unlike the Surry Power Station that discharges to the mouth of the tidal James River, the North Anna Station discharges into a series of open canals that flow back to the Lake. While the thermal discharge is likely to have a greater effect in the colder months, the increased temperatures in the summer could also have an adverse effect on fish behavior and ecology in the Lake.*

NAD-W-6 *The Lake Anna Dam provides cooling water for the Power Station, but also blocks migratory fish moving upstream from the North Anna River. Anadromous, catadromous, and freshwater fish move upstream to spawn in the spring, and possibly need the habitat at other times of the year when fish are searching for forage, refuge, or suitable habitats. American eel are well known for their migrations and are present downstream of the Dam. The Atlantic States Marine Fisheries Commission's plan recommends restoring eels to their historical habitat and increasing their abundance in habitats where they currently reside. River herring are likely to have historically accessed to the habitat upstream of the Dam during natural flow conditions. In addition to restoring fish to their historical or preferred habitat, freshwater mussel populations are distributed in a watershed by the movement of mussel host fish species common to the North Anna River. The mussels and host fish will both benefit from fish passage.*

Summary Comments and Recommendations

The Department recommends that the NRC adopt the following recommendations in order to maintain optimum protection of fish and wildlife resources at North Anna Power Station.

1. *Maintain an efficient recording and reporting system for migratory bird mortality at the North Anna Power Station.*

2. *Develop a method to return impinged fish on the cooling water intake screens back to the Lake. The intake screen should be replaced with a series of one millimeter or less wide with intake water velocities less than 0.5 feet per second.*

NAD-W-7 1. *Determine the impacts from the thermal discharges on fish distribution, spawning, and feeding. The specific study design should be developed with the North Anna Power Station staff, FWS, and other interested parties; and*

NAD-W-8 2. *Assess the upstream movement of fish to the Dam with continuous sampling of water quality, flow, and species composition from February 1 to November 30. The specific study design should be developed with the North Anna Power Station staff, FWS, and other interested parties.*

We appreciate the opportunity to review the draft environmental document and provide comments on natural resource protection. If you have any questions regarding these comments, please contact David W. Sutherland of the Service's Chesapeake Bay Field Office by phone at (410) 573-4535, or by e-mail at David_Sutherland@fws.gov.

Sincerely,

Michael I. Cieszik

THE TOWN OF LOUISA

Incorporated 1873

Post Office Box 53
219 East Main Street
Louisa, Virginia 23093

Telephone (540) 967-1400
Facsimile (540) 967-9580
e-mail info@louisatown.org

June 25, 2002

Mr. Andrew Kugler
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Kugler

I regret that I will be unable to attend the NRC's public meeting held today in Louisa County on the license renewal proposal for North Anna Nuclear Power Station Units 1 and 2. Therefore, I am writing this letter to offer my support on behalf of their proposal.

NAD-Y-1 NAD-Y-2 Throughout Dominion Virginia Power's twenty year history in Central Virginia they have proven themselves good corporate citizens -- financially as well as environmentally. Since 1966 Dominion Virginia Power has paid more than $17.0 million in property taxes to Louisa County. In 2001 alone, they contributed $10.99 million to the County's economy. Although it may seem like it is not the money alone that counts. North Anna employs 825 people from the surrounding communities. They demonstrate their commitment to the community through active and frequent involvement.

NAS-Y-4 North Anna Power Station commitment to the environment is above reproach. Nuclear energy itself does not produce any of the air emissions associated with fossil-fueled generation plants thus nuclear generation helps to protect the environment. The company's conservation efforts focus on protecting and enhancing fish populations as well as migratory birds through policies, procedures and permits obtained from the United States Fish and Wildlife Service. As good stewards to the environment Dominion biologist regularly monitor the health of fish populations with no harmful results found. As I perceive it, North Anna Nuclear Power Station is environmentally safe, environmentally sound and environmentally responsible.

NAD-Y-5 Dominion Virginia Power is committed to safety at North Anna Power Station. They plan it into all aspects of work activity. Safety work practices are reinforced through training and continuous improvement measures.

NAD-Y-6 North Anna Power Station plays an essential role in meeting the Commonwealth's energy needs. It produces approximately 17 percent of the electricity used by fellow Virginians. That is the equivalent to lighting up some 430 homes across the Old Dominion. For nine consecutive years NAD-Y-7 North Anna Power Station has been recognized as among the lowest-cost producers of nuclear-generated electricity in the United States. The North Anna station plays a crucial role in

providing low-cost energy that makes Virginia attractive to business. The continued operation of North Anna Power Station is critical to the development of a robust, competitive retail electric market in Virginia.

Thank you for allowing me the opportunity to provide these comments in support of the license renewal for Units 1 and 2 at North Anna Power Station. If you should have questions or comments please, do not hesitate to contact me at (540) 967-1400. I am

Respectfully,

George E. Morrison, III
Town Manager

cc Mr. Philip L. Sparks
Senior Manager State & Local Affairs
Dominion

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 Pacific Northwest National Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Argonne National Laboratory.

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John Tappert	Nuclear Reactor Regulation	Section Chief
Barry Zalcman	Nuclear Reactor Regulation	Technical Monitor
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Michael Masnik	Nuclear Reactor Regulation	Project Management
James Wilson	Nuclear Reactor Regulation	Project Management
Robert Palla	Nuclear Reactor Regulation	Severe Accident Mitigation Alternatives
Duke Wheeler	Nuclear Reactor Regulation	Project Management
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(b) Lawrence Livermore National Laboratory is operated for the U.S. Department of Energy by the University of California.
(c) Los Alamos National Laboratory is operated for the U.S. Department of Energy by the University of California.
(d) Argonne National Laboratory is operated for the U.S. Department of Energy by the University of Chicago.

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Virginia Electric and Power Company's Application for License Renewal of North Anna Power Station, Units 1 and 2

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Virginia Electric and Power Company's Application for License Renewal of North Anna Power Station, Units 1 and 2

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and Virginia Electric and Power Company (VEPCo) and other correspondence related to the NRC staff's environmental review, under 10 CFR Part 51, of VEPCo's application for renewal of the North Anna Power Station, 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/reading-rm.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. The ADAMS accession numbers for each document are included below.

May 29, 2001	Letter from NRC to Mr. Walter Newsome, Alderman Library, University of Virginia at Charlottesville, concerning the maintenance of reference material for the North Anna license renewal application (Accession No. ML011500106)
May 29, 2001	Letter from Mr. David A. Christian, Virginia Electric Power Company (VEPCo) to the NRC, submitting the application for the renewal of the operating licenses for the Surry and North Anna Power Stations, Units 1 and 2 (Accession No. ML011500502)
August 6, 2001	Letter from NRC to Ms. JoAnn Tetrault, Director, Louisa County Public Library, concerning the maintenance of reference material for the North Anna license renewal application (Accession No. ML012180137)
August 28, 2001	Letter from NRC to Mr. David A. Christian, VEPCo, forwarding the Notice of Intent to prepare an environmental impact statement and conduct scoping process for license renewal for North Anna Power Station, Units 1 and 2 (Accession No. ML012220583)

September 26, 2001	Notice of October 18, 2001, public meeting to discuss environmental scoping process for the North Anna Power Station, Units 1 and 2, license renewal application (Accession No. ML012690346)
September 27, 2001	Letter from NRC to Ms. Reeva Tilley, Chairman, Virginia Council on Indians, inviting scoping comments (Accession No. ML012710136)
October 12, 2001	Scoping comment letter from Hon. R. Edward Houck, Senate of Virginia (Accession No. ML012920545)
October 17, 2001	NRC letter to Mr. David A. Christian, VEPCo, "Request for Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives for the Surry and North Anna Power Stations, Units 1 and 2" (Accession No. ML012910292)
October 25, 2001	Email from Mr. Jerry Rosenthal providing scoping comments on North Anna Power Station license renewal (Accession No. ML013460243)
October 26, 2001	Letter to NRC from John P. Wolflin, U.S. Fish and Wildlife Service, providing scoping comments on North Anna Power Station license renewal (Accession No. ML013460246)
November 1, 2001	Letter from Hon. Eric Cantor, U.S. Congress, providing scoping comments on North Anna Power Station license renewal (Accession No. ML013650011)
November 6, 2001	Summary of October 18, 2001, public scoping meetings for the North Anna Power Station, Units 1 and 2, license renewal application (Accession No. ML013120266)
December 10, 2001	Letter from Mr. David A. Christian, VEPCo, to NRC, responding to the October 17, 2001, Request for Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives for the Surry and North Anna Power Stations, Units 1 and 2 (Accession No. ML013520484)
December 26, 2001	Memo to file, socioeconomic and aquatic information provided by VEPCo (Accession No. ML013610514)

January 2, 2002	NRC letter to Mr. David A. Christian, VEPCo, "Issuance of Environmental Scoping Summary Report Associated with the Staff's Review of the Application by Dominion for Renewal of the Operating Licences for North Anna Power Station, Units 1 and 2" (Accession No. ML020160608)
January 3, 2002	NRC letter to Ms. Cara H. Metz, Virginia Department of Historic Resources, concerning the potential for license renewal at the Surry and North Anna Power Stations to affect historic resources (Accession No. ML020070569)
January 17, 2002	NRC note to file, information provided by VEPCo during the NRC site audits in relation to the license renewal applications for the Surry and North Anna Power Stations, Units 1 and 2 (Accession No. ML020180119)
January 23, 2002	NRC note to file, information provided by VEPCo in relation to severe accident mitigation alternatives in its license renewal application for the Surry Power Station, Units 1 and 2 (Accession No. ML020250545)
January 24, 2002	NRC letter to Ms. Karen Mayne of the U.S. Fish and Wildlife Service requesting a list of protected species within the area under evaluation for the Surry and North Anna Power Stations license renewal (Accession No. ML020250611)
February 1, 2002	NRC note to file, information provided by VEPCo in relation to severe accident mitigation alternatives in its license renewal application for the Surry Power Station, Units 1 and 2 (Accession No. ML020430372)
March 14, 2002	NRC letter to Mr. John P. Wolflin, U.S. Fish and Wildlife Service, responding to scoping comments regarding license renewal for the Surry and North Anna Power Stations (Accession Nos. ML020740498 and ML020230063)
April 19, 2002	NRC letter to Mr. David A. Christian, VEPCo, "Request for Comments on the Draft Plant-Specific Supplement 7 to the Generic Environmental Impact Statement Regarding North Anna Power Station, Units 1 and 2" (Accession No. ML021140439)

April 23, 2002	NRC letter to the U.S. Environmental Protection Agency, filing a copy of the supplemental environmental impact statement (NUREG-1437, Supplement 7) regarding license renewal for North Anna Power Station, Units 1 and 2 (Accession Nos. ML021140391 [letter] and ML021220674 [NUREG package])
April 23, 2002	NRC letter to Mr. David A. Christian, VEPCo, "Notice of Availability of the Draft Plant-Specific Supplement to the Generic Environmental Impact Statement Regarding North Anna Power Station, Units 1 and 2" (Accession No. ML021140504)
April 30, 2002	NRC letter to Mr. David A. Christian, VEPCo, "Issues Raised by the U.S. Fish and Wildlife Service Outside the Scope of License Renewal For North Anna Power Station, Units 1 and 2" (Accession No. ML021200364)
May 22, 2002	Letter from Ms. Karen Mayne of the U.S. Fish and Wildlife Service to NRC providing a list of protected species within the area under evaluation for the Surry and North Anna Power Stations license renewal (Accession No. ML021560147)
June 6, 2002	NRC Notice of Public Meeting to Discuss the Draft Environmental Impact Statement for the North Anna Power Station, Units 1 and 2, License Renewal (Accession No. ML021610474)
July 19, 2002	Summary of June 25, 2002, public meetings held to discuss the Draft Environmental Impact Statement for the North Anna Power Station, Units 1 and 2 License Renewal (Accession Nos. Package ML022040286), Package includes meeting summary, transcripts, afternoon comment letter, and presentation slides from public meetings held June 25, 2002 (Summary ML022040206; ML022040226 [afternoon session]; ML021970254 comment letter; ML022040016 [evening session]; and ML021780410 slides)
July 24, 2002	Letter from Michael T. Chezik, Regional Environmental Officer, U.S. Department of the Interior to NRC providing general comments to the Generic Environmental Impact Statement for the License Renewal of North Anna Power Station, Units 1 and 2 (Accession No. ML022130323)

July 29, 2002	E-mail from David G. Schwartz, M.D., regarding the Draft Supplemental Environmental Impact Statement for North Anna Power Station, Units 1 and 2, license renewal application (Accession No. ML022520047)
July 29, 2002	NRC letter to Chief Leo Henry, Mr. Neil Patterson, and Mr. Richard Hill, Tuscarora Nation," Availability of Draft Plant-Specific Supplements 6 and 7 to the Generic Environmental Impact Statement Regarding the License Renewal for the Surry and North Anna Power Stations" (Accession No. ML022140548)
July 30, 2002	Comment letter from Leslie N. Hartz, VEPCo, regarding the Draft Supplemental Environmental Impact Statement for North Anna Power Station, Units 1 and 2, license renewal application (Accession No. ML022210143)
September 14, 2002	NRC letter to Dr. Oula Shehab, Virginia Department of Environmental Quality, "Draft Plant-Specific Supplements 6 and 7 to the Generic Environmental Impact Statement Regarding the License Renewal for the Surry and North Anna Power Stations" (Accession No. ML022610691)
October 21, 2002	NRC letter to Mr. David A. Christian, VEPCo, "Revision of Schedule For The Review of the North Anna, Units 1 and 2, and Surry, Units 1 and 2, License Renewal Applications" (Accession No. ML022950104)

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:

U.S. Fish and Wildlife Service, Chesapeake Bay Field Office, Annapolis, Maryland

U.S. Fish and Wildlife Service, Virginia Field Office, Gloucester, Virginia

Virginia Department of Agriculture and Consumer Services (Plant Protection), Richmond, Virginia

Virginia Department of Conservation and Recreation, Richmond, Virginia

Virginia Department of Conservation and Recreation (Division Of Natural Heritage), Richmond, Virginia

Virginia Department of Environmental Quality, Richmond, Virginia

Virginia Department of Game and Inland Fisheries, Richmond, Virginia.

Virginia Department of Historic Resources, Richmond, Virginia

Assessor, Commissioner of Revenue, Louisa County, Virginia

Commissioner of Revenue, Louisa County, Virginia

County Administrator, Louisa County, Virginia

Department of Social Services, Louisa County, Virginia

Director of Finance, Louisa County, Virginia

Economic Development, Louisa County, Virginia

Farm Service Agency, Louisa County, Virginia

Louisa County, Director of Planning and Community Development, Louisa, Virginia

Town of Mineral, Town Manager, Mineral, Virginia

Chamber of Commerce, Louisa, Virginia

Appendix D

Lake Anna Advisory Committee, Lake Anna, Virginia

Louisa County Historical Society, Louisa, Virginia

Treasurer's Office, Orange County, Virginia

Tuscarora Nation, Lewiston, New York

Administrative Assistant for School Admissions, Spotsylvania Public Schools, Virginia,

Budget Manager, Spotsylvania County, Virginia

Lake Anna State Park, Spotsylvania, Virginia

Lloyd Real Estate, Louisa, Virginia

VEPCo, Reservoir Coordinator, Nuclear Site Services, North Anna Power Station, Virginia

Dominion Resource Services, Environmental Lead, License Renewal, Glenn Allen, Virginia

Duke Oil Company, Mineral, Virginia

Appendix E

Virginia Electric and Power Company's Compliance Status and Consultation Correspondence

Appendix E

Virginia Electric and Power Company's Compliance Status and Consultation Correspondence

The list of licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for North Anna Power Station, Units 1 and 2, are shown in Table E-1.

Following Table E-1 are reproductions of correspondence prepared and sent during the evaluation process of the application for renewal of the operating licenses for North Anna Power Station, Units 1 and 2.

Source	Recipient	Date of Letter
United States Nuclear Regulatory Commission (C. I. Grimes)	Virginia Department of Historic Resources	January 3, 2002
United States Nuclear Regulatory Commission (C. I. Grimes)	U.S. Fish and Wildlife Service	January 24, 2002
Commonwealth of Virginia Department of Environmental Quality (E. L. Irons)	Dominion Virginia Power Company	February 21, 2002
United States Department of the Interior (K. L. Mayne)	United States Nuclear Regulatory Commission	May 22, 2002

Table E-1. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for North Anna Power Station, Units 1 and 2

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NRC	10 CFR Part 50	Operating license, North Anna Unit 1	NPF-4	04/01/78	04/01/18	Authorizes operation of Unit 1
NRC	10 CFR Part 50	Operating license, North Anna Unit 2	NPF-7	08/21/80	08/21/20	Authorizes operation of Unit 2
FWS	Migratory Bird Treaty Act (16 USC 703-712)	Permit	MB705136-0	04/22/02	03/31/03	The permit authorizes removal of up to 15 osprey nests causing safety hazards.
FWS	Section 7 of the Endangered Species Act (16 USC 1536)	Consultation	NA	Letter from NRC to FWS 01/24/02	NA	Requires a Federal agency to consult with FWS regarding whether a proposed action will affect endangered or threatened species. FWS determined that the renewal of the North Anna OLs may affect the bald eagle.
DOT Research and Special Programs Administration	49 CFR Part 107, Subpart G	Registration	053000020241	06/05/00	06/30/02	Registration covers hazardous materials shipments
VDHR	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation	NA	Letter from NRC to VDHR 01/03/02	NA	The National Historic Preservation Act requires Federal agencies to take into account the effect of any undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.
VDEQ	Section 307(c)(3)(A) of the Coastal Zone Management Act [16 USC 1456(c)(3)(A)]	Consistency determination with the Virginia Coastal Management Program	NA	02/21/02	NA	Certification that North Anna complies with the Virginia Coastal Program
VDH	12 VAC 5-590-190	Permit	2109610	06/17/91; Revised 05/04/98	None	Permit authorizes operation of potable water potable water supply system

Table E-1. (contd)

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
VDEQ	Federal Clean Water Act, Section 402 (33 USC 1342), 9 VAC 25-31-50	National pollutant discharge elimination system (NPDES) permit	VA0052451	01/11/01	01/11/06	The NPDES permit covers plant and stormwater discharges
VDEQ	Federal Clean Water Act, Section 401 (33 USC 1341)	NPDES permit	VA0052451	01/11/01	01/11/06	Issuance of a NPDES permit constitutes Section 401 certification by the Commonwealth
VDEQ	Federal Clean Air Act, Title V (42 USC 7661, et seq); 9 VAC 5-80-10	Air operating permit	None	01/06/99	None	General air emission source operation
VDEQ	9 VAC 5-20-160	Registration	40726	NA	Annual recertification	Annual recertification of air emission sources
VDEQ	9 VAC 5-80-10	Permit	None	10/20/93	None	New source review permit covering installation of the emergency blackout generator
VDEQ	9-VAC 5, Chapter 500	Exclusionary general permit	None	6/18/98	None	Covers operating emissions from auxiliary boilers, emergency diesel generators, and station blackout generator

CFR = Code of Federal Regulations
COV = Code of Virginia
DOT = U.S. Department of Transportation
EPA = U S. Environmental Protection Agency
FWS = U.S. Fish and Wildlife Service
NRC = U.S. Nuclear Regulatory Commission
USC = United States Code
VAC = Virginia Administrative Code
VDEQ = Virginia Department of Environmental Quality
VDH = Virginia Department of Health
VDHR = Virginia Division of Historic Resources
VMRC = Virginia Marine Resources Commission

Appendix E

January 3, 2002

Ms. Cara H. Metz, Director
Division of Resource Services and Review
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Ms. Metz:

This letter responds to issues raised in your letter dated February 13, 2001, to Mr. William Corbin of Virginia Electric and Power Company (VEPCo), regarding the license renewal Environmental Reports for the Surry and North Anna Power Stations. Our response has benefitted from productive discussions between representatives of my staff and Dr. Ethel Eaton of your staff, including a meeting held at the Virginia Department of Historic Resources on September 21, 2001, for Surry.

In response to your original letter, VEPCo authorized cultural resource assessments of the Surry and North Anna sites. These assessments were conducted by the Louis Berger Group, Inc., and the completed reports were delivered to VEPCo in March 2001, with an addendum to the North Anna report delivered in October 2001. A copy of the Surry report was provided to the U.S. Nuclear Regulatory Commission (NRC) during our recent visit to the site in September 2001. Also during this September visit, Dr. Eaton and our consulting archaeologist, Dr. W. Bruce Masse of Los Alamos National Laboratory, had the opportunity to tour the grounds of the Surry Power Plant. Dr. Masse later reviewed the assessment report and pertinent archival records on file at the Virginia Department of Historic Resources. We received a copy of the North Anna report and its addendum following our visit to that site in October 2001.

The NRC is acutely aware of the richness of the history in and around Gravel Neck Peninsula, and the lower James River in general. We are also aware of the potential for significant intact historic and archaeological resources to be present in the undeveloped portions of the Surry and North Anna Power Stations. We have discussed this topic at considerable length with the station managers and with other appropriate representatives from VEPCo, and are confident they share our concern for these cultural resources. Station procedures provide for the protection of cultural resources during future site activities.

Dr. Eaton, our reviewers, and the cultural resources assessment reports are in agreement that there is little likelihood that intact cultural resources exist in the presently developed portions of the Surry and North Anna Power Stations.

Because there are current operating procedures that take into account the inadvertent discovery of historic and archaeological remains at both stations, and because the license renewal is not expected to result in major refurbishment nor the need to expand operations into the currently undeveloped portions of the stations, we believe that license renewal is unlikely to

affect cultural resources We therefore also consider it unnecessary at this time to enter into a programmatic agreement pursuant to the license renewal However, should conditions specific to either of the stations change, or should the NRC license renewal process change in general, we would be prepared to reconsider this decision

Please let us know if you have any other questions or concerns about the license renewal process. We will send you copies of the completed draft Supplemental Environmental Impact Statements for both the Surry and North Anna Power Stations as soon as they become available for review. Also, if you do not yet have a copy of the Berger Group cultural resource assessment reports for the two stations and wish to obtain copies for your files, we would be happy to provide you with copies.

Sincerely,
Original Signed By: ClGrimes
Christopher I. Grimes, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-280, 50-281, 50-338, and 50-339

Enclosure: As stated

cc w/encl see next page

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Environmental r/f
DMatthews/FGillespie
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EHickey (PNNL)

Accession no.: **ML020070569**

*See previous concurrence
Document Name:G:\Rgeb\North Anna-Surry\Common Items\Historic Preservation\NRC ltr to VDHR.wpd

OFFICE	PM:RGEB	SC:RGEB	C:RGEB	PD:RLEP	OGC (NLO)
NAME	AKugler*	BZalcman*	CCarpenter*	CGrimes*	RWeisman*
DATE	12/13/01	12/13/01	12/14/01	01/04/02	01/03/02

OFFICIAL FILE COPY

January 24, 2002

Ms Karen Mayne, Supervisor
Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, Virginia 23061

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE SURRY AND NORTH ANNA POWER STATIONS LICENSE RENEWAL

Dear Ms. Mayne:

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Virginia Electric and Power Company for the renewal of the operating licenses for its Surry and North Anna Power Stations, Units 1 and 2. The NRC is preparing station-specific supplements to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed license renewal, for which we are required to evaluate potential impacts to threatened and endangered species

The proposed action would include use and continued maintenance of existing facilities and transmission lines and would not result in new construction or disturbance. The Surry Power Station is located on the James River in Surry County, Virginia. The transmission line corridors for this station pass through portions of Surry, Isle of Wight, Prince George, and Charles City counties, and the corporate limits of the cities of Suffolk, Chesapeake, Newport News, and Hopewell, Virginia. In total, the corridors include about 5000 acres (170 miles in length)

The North Anna Power Station is located on the south side of Lake Anna in Louisa County, Virginia. The transmission line corridors for this station pass through portions of Louisa, Hanover, Goochland, Powhatan, Henrico, Chesterfield, Spotsylvania, Caroline, Orange, Culpeper, and Fauquier counties, Virginia. In total, the corridors include about 2900 acres (120 miles in length). In addition, Lake Anna, which is fed by the North Anna River and impounded by the North Anna Dam, is used as part of the cooling system for North Anna Power Station. Therefore, the lake and the Lower North Anna River are considered part of the aquatic environment of interest.

To support the environmental impact statement preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests a list of species and information on threatened, endangered, proposed, and candidate species and critical habitat that may be in the vicinity of the Surry and North Anna Power Stations and their associated transmission lines. We have enclosed figures showing the location of the stations and their associated transmission lines.

Also, we would like confirmation that the Chesapeake Bay Field Office will serve as the U.S. Fish and Wildlife Service's point of contact for Endangered Species Act compliance, including any Section 7 consultation that may be needed, for the Surry and North Anna Power Stations.

If you have any comments or questions, please contact Andrew J. Kugler, Senior Project Manager, at (301) 415-2828.

Sincerely,
ClGrimes
Christopher I. Grimes, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos 50-280, 50-281, 50-338 and 50-339

Enclosure: As stated

cc: John P. Wolflin, Supervisor
Chesapeake Bay Field Office
U S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, Maryland 21401

cc: See next page

Accession nos.:
1. **Cover letter: ML020250603**
2. **Enclosure: Figures Depicting the Location of the Surry and North Anna Power Stations and Their Associated Transmission Lines - ML020100388**
3. **Package: ML020250611**

DISTRIBUTION:

DMatthews/FGillespie	GEdison
CGrimes	SMonarque
JTappert	RPrato
AKugler	Environmental R/F
EHickey (PNNL)	

*See previous concurrence
DOCUMENT NAME: G:\RGEB\North Anna-Surry\Surry\Consult\Ltr to FWS-E&T spec.wpd

OFFICE	PM RLEP	SC:RLEP	RLEP.DRIP
NAME	AKugler*	JTappert*	CGrimes*
DATE	01/22/02	01/22/02	01/24/02

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COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Taylor Murphy, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
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Robert G. Burnley
Director
(804) 698-4000
1-800-592-5482

February 21, 2002

J. W. White, Ph.D.
Manager, Water and Waste Programs
Dominion Virginia Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

RE: North Anna Power Station License Renewal: Application by Dominion Virginia Power Company to U.S. Nuclear Regulatory Commission for Renewed Operating License
Federal Consistency Certification under the Coastal Zone Management Act
DEQ-01-187F

Dear Dr. White:

This letter responds to your September 27, 2001 letter (and subsequent information received on October 30, 2001) requesting the Department of Environmental Quality's concurrence with the federal consistency certification for renewal of the Dominion Virginia Power Company's operating license for the North Anna Power station. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal consistency certifications and responding to applicants for federal approval on behalf of the Commonwealth. The following agencies took part in this review:

Department of Environmental Quality
Department of Conservation
Department of Health
Marine Resources Commission
Chesapeake Bay Local Assistance Department.

In addition, the Department of Game and Inland Fisheries, the Thomas Jefferson Planning District Commission, and Louisa County were invited to comment.

Project Description

Dominion Virginia Power submitted information for this review in the form of two documents. One, submitted with the initial letter, is called "Appendix E, Environmental Report" (cited hereinafter as "Appendix E"). The other is entitled "Federal Consistency Certification for North Anna Power Station License Renewal" and is dated October 26, 2001 (cited hereinafter as "Certification").

Dominion Virginia Power owns and operates the North Anna Power Station, a nuclear electric generating station located on the southern shore of Lake Anna in Louisa County. As the Certification and the Environmental Report, Appendix E indicate, Louisa County is not included in Virginia's designated coastal management area. However, the proximity of the North Anna Power Station to Spotsylvania County, across the lake, and the presence of power lines in Spotsylvania and other counties within the coastal management area warrant consistency review because these facilities and their operation may have reasonably foreseeable effects upon coastal uses or resources (Certification, page 1; Appendix E, page E-2). See 15 CFR Part 930, subpart D, sections 930.50 and 930.54. The plant consists of two nuclear reactors and associated steam turbines that generate approximately 1,800 megawatts of electricity. The Unit 1 license is to expire on April 1, 2018, while the Unit 2 license will expire on August 21, 2020. Both licenses have terms of 20 years, and are to be renewed for new 20-year terms. (Appendix E, page E-3). The Company expects North Anna Power Station operations during the new license term to be a continuation of present operations (Appendix E, page E-2).

Federal Consistency Analysis

The Virginia Coastal Resources Management Program (VCP) is comprised of a network of programs administered by several agencies. In order to be consistent with the VCP, the applicant for federal licensing must obtain all the applicable permits and approvals listed under the Enforceable Programs of the VCP prior to commencing the project. Based on the commitments provided in the Consistency Certification that Dominion Virginia Power will obtain and comply with all approvals from agencies administering the applicable Enforceable Programs (Certification, page 1; Appendix E, page E-2) and the comments submitted by agencies administering the Enforceable Programs, the Department of Environmental Quality concurs with the finding that the license renewal and continued operation of the North Anna Power Station is consistent with Virginia's Coastal Resources Management Program.

This discussion analyzes the continued operation of the project under the license renewal in light of the Enforceable Programs of the Virginia Coastal Management Program.

1. Subaqueous Lands Management. According to the Certification, the applicant has no plans for any activity under the license renewal that would require a permit from the Commission (page 12, Table 2, item b). The Marine Resources Commission indicates that there are no activities, present or prospective, at the North Anna Power Station that would require a Marine Resources Commission permit.

2. Coastal Lands Management. According to the Chesapeake Bay Local Assistance Department, the proposed license renewal is not subject to any requirements under the Chesapeake Bay Preservation Act because Louisa County is outside the geographic region subject to the Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2100 et seq.). The Certification indicates that there is no new development applied for under the license renewal. Transmission lines are conditionally exempt from the Act.

3. Wetlands Management. According to the Certification, Dominion Virginia Power does not now conduct, and does not intend to conduct, any alteration of wetlands in the vicinity of the North Anna Power Station (page 12, Table 2, items c.1 and c.2). DEQ's Virginia Water Protection Program indicates that the license renewal will not result in any impacts to wetlands.

4. Point Source Water Pollution Control. DEQ's Virginia Water Protection Program indicates that the license renewal will not result in any impacts to surface waters. The Power Station is subject to an existing Virginia Pollutant Discharge Elimination System permit (No. VA 0052451) (Certification, page 15, Table E-1). According to DEQ's Northern Virginia Regional Office, the Power Station is in compliance with that permit.

5. Non-point Source Water Pollution Control. As with wetlands (item 3 above), the current operation of the North Anna Power Station does not involve any land-disturbing activity, and will not involve it in the future, according to the Certification (page 13, Table 2, item e.1). Accordingly, Virginia's non-point source water pollution control program, the Erosion and Sediment Control Plan requirement, does not apply to this project.

6. Air Pollution Control. According to DEQ's Northern Virginia Regional Office, the North Anna Power Station is in full compliance with its air permits.

Accordingly, the project is consistent with the Air Pollution Control Program of the Virginia Coastal Resources Management Program.

7. Other Enforceable Programs. As the Certification indicates , the remaining Enforceable Programs of the Virginia Coastal Resources Management Program do not apply to the renewal of the NRC license for the North Anna Power Station. Specifically, the Fisheries Management Program, including the State Tributyltin Regulatory Program, is not applicable to continued operation of the North Anna Power Station. Neither is the Dunes Management Program or the Shoreline Sanitation Program.

Environmental Impacts and Mitigation

1. Natural Heritage and Wildlife Resources. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered species of plants and animals, unique or exemplary natural communities, and significant geologic formations, according to the Department of Conservation and Recreation. That Department indicates that natural heritage resources have not been documented as present in the vicinity of the project. In addition, the Department of Conservation and Recreation represents the Department of Agriculture and Consumer Services in commenting on state-listed endangered plant and insect species that might be affected by a project. The continued operation of the North Anna Power Station will not affect protected plant or insect species.

The Department of Conservation and Recreation's Division of Natural Heritage (Christopher Ludwig, telephone 371-6206) should be contacted for an update if a significant amount of time passes before this information is used.

2. Recreation Resources. Continued operation of the North Anna Power Station will not adversely affect any existing or planned recreational facilities. Nor will it affect streams on the National Park Service Nationwide Inventory, Final List of Rivers or potential Virginia Scenic Rivers. The project will not affect any Virginia Byways.

3. Solid and Hazardous Waste Management. The DEQ's Waste Division, Office of Remedial Programs did a cursory review of its data files and found that the North Anna Power Station is listed as a small-quantity generator of hazardous waste, subject to the provisions of Title 40, Code of Federal Regulations, Part 262 (and related provisions in Parts 264, 265, and 268), which are adopted by reference in the Virginia Hazardous Waste Management Regulations. The most recent DEQ inspection of the North Anna Power Station took place in August 1999, according to the DEQ's Northern Virginia

Regional Office; the inspection revealed that the Station was in compliance with all the requirements applicable to small-quantity generators.

4. Radiological Health Considerations. According to the Department of Health's Radiological Health Program, the Department of Health provides independent verification of this facility's environmental monitoring program for radiological releases. The Department of Health implemented its environmental monitoring program during the pre-operational stage of the facility; the program continues to the present day. There is no indication, in the published annual reports of the monitoring program, of any releases of radiation affecting the environment in the history of the program.

In addition, the applicant has been supportive of the efforts of state and local governments in maintaining an effective State Emergency Response Plan in case of radiological emergencies at the power plant. The Nuclear Regulatory Commission license includes a condition requiring certification of the Plan by the Federal Emergency Management Agency (FEMA); FEMA has certified the Plan.

Thank you for the opportunity to comment on this federal consistency certification.

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures
cc: Derral Jones, DCR
Leslie P. Foldesi, VDH
Thomas D. Modena, DEQ-DWPC-ORP
K. S. Narasimhan, DEQ-DAPC-ODA
Terry H. Darton, DEQ-NVRO
Jon D. Terry, DEQ-NVRO
Brenda K. Winn, DEQ-VWPP
R. B. Stagg, MRC
Catherine M. Harold, CBLAD
Nancy K. O'Brien, Thomas Jefferson PDC
C. Lee Linticum, Louisa County
Andy Kugler, U.S. NRC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

May 22, 2002

Mr. Christopher Grimes
Nuclear Regulatory Commission
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
Washington, D.C. 20555-0001

P.T. Kuo

Re: License Renewal for Surry and North Anna Power Stations, Surry and Louisa Counties, Virginia

Mr. Grimes:

The U.S. Fish and Wildlife Service (Service) has received your request for a list of federally listed or proposed endangered and threatened species and designated critical habitat within the area under evaluation for the Surry and North Anna Power Stations license renewal. This letter is submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S C. 1531 et seq.). Attached are lists of species with federal status and species of concern that have been documented or may occur in the counties where your project is located. These lists were prepared by this office and are based on information obtained from previous surveys for rare and endangered species.

The Service would like to confirm that any further Section 7 consultation necessary for this project, pursuant to the ESA, will be conducted by personnel of the Chesapeake Bay Field Office in Annapolis, Maryland.

If you have any questions or need further assistance, please contact Mr. Eric Davis of this office at (804) 693-6694, extension 104.

Sincerely,

J. Eric Davis Jr.
for Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

5.1.0147

cc: USFWS, Chesapeake Bay Field Office, Annapolis, MD (David Sutherland)

SURRY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT

Species of Concern

INVERTEBRATES		
Speyeria diana	Diana fritillary	G3
Stygobromus araeus	Tidewater interstitial amphipod	G2
VASCULAR PLANTS		
Carex decomposita	Epiphytic sedge	G3
Chamaecrista fasciculata var. macrosperma	Marsh senna	G5T2
Desmodium ochroleucum	Creamflower tick-trefoil	G2G3
Rudbeckia heliopsidis[2]	Sun-facing coneflower	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county, concentrated shoreline use has been documented on the James River

[2]Surveys needed within 5-miles of Prince George County species location

March 22, 1999
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

ISLE OF WIGHT COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT

Species of Concern

INVERTEBRATES		
Caecidotea phreatica	Phreatic isopod	G1
Speyeria diana	Diana fritillary	G3
Stygobromus araeus	Tidewater interstitial amphipod	G2
Stygobromus indentatus	Tidewater amphipod	G2G3
NON-VASCULAR PLANTS		
Sphagnum cyclophyllum	Circular leaved peatmoss	G3
Sphagnum macrophyllum var macrophyllum	Large-leaf peatmoss	G3T3
VASCULAR PLANTS		
Carex decomposita	Epiphytic sedge	G3
Litsea aestivalis[1]	Pondspice	G3
Trillium pusillum var. virginianum[2]	Virginia least trillium	G3T2

[1]Survey may be needed along the Blackwater River.
[2]This species has been documented in an adjacent county and may occur in this county

May 29, 2001
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

PRINCE GEORGE COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT

Species of Concern

INVERTEBRATES		
Speyeria diana	Diana fritillary	G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma	Marsh senna	G5T2
Rudbeckia heliopsidis	Sun-facing coneflower	G2
Trillium pusillum var. virginianum[2]	Virginia least trillium	G3T2

[1]Nesting occurs in this county, concentrated shoreline use has been documented on the James River.
[2]This species has been documented in an adjacent county and may occur in this county.

March 22, 1999
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CHARLES CITY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT
Helonias bullata[2]	Swamp pink	LT
Isotria medeoloides[2]	Small whorled pogonia	LT

Species of Concern

INVERTEBRATES		
Speyeria diana	Diana fritillary	G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma	Marsh senna	G5T2
Enocaulon parkeri	Parker's pipewort	G3
Juncus caesariensis	New Jersey rush	G2
Nuphar sagittifolia	Narrow-leaved spatterdock	G5T2T3
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the James River.
[2]This species has been documented in an adjacent county and may occur in this county

May 29, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF SUFFOLK, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT

Species of Concern

INVERTEBRATES		
Chlorochroa dismalia	Dismal Swamp green stink bug	G2
Speyeria diana	Diana fritillary	G3
Stygobromus araeus	Tidewater interstitial amphipod	G2
Stygobromus indentatus	Tidewater amphipod	G2G3
NON-VASCULAR PLANTS		
Sphagnum carolinianum	Carolina peatmoss	G3
VASCULAR PLANTS		
Eriocaulon parkeri	Parker's pipewort	G3
Gentiana autumnalis	Pine-barren gentian	G3
Litsea aestivalis[1]	Pondspice	G3
Rhynchospora pallida	Pale beakrush	G3
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Survey may be needed along the Blackwater River

February 28, 2000
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF CHESAPEAKE, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
None listed		

Species of Concern

INVERTEBRATES		
Euphyes dukesi	Scarce swamp skipper	G3
Pseudopolydesmus paludicolous	A millipede	G1
Stygobromus araeus	Tidewater interstitial amphipod	G2
NON-VASCULAR PLANTS		
Sphagnum macrophyllum var. macrophyllum	Large-leaf peatmoss	G3T3
VASCULAR PLANTS		
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

May 29, 2001
Prepared by U S. Fish and Wildlife Service, Virginia Field Office

CITY OF NEWPORT NEWS, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT

Species of Concern

None documented

August 26, 1999
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

LOUISA COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedgemussel	LE

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3

February 8, 2001
Prepared by U S. Fish and Wildlife Service, Virginia Field Office

HANOVER COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedgemussel	LE
VASCULAR PLANTS		
Aeschynomene virginica[1]	Sensitive joint-vetch	LT
Isotria medeoloides[1]	Small whorled pogonia	LT

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Sigara depressa	Virginia Piedmont water boatmen	G1G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[1]	Marsh senna	G5T2

[1]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U S Fish and Wildlife Service, Virginia Field Office

POWHATAN COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT
INVERTEBRATES		
Pleurobema collina[1]	James spinymussel	LE

Species of Concern

INVERTEBRATES		
Lexingtonia subplana	Virginia pigtoe	G1Q
VASCULAR PLANTS		
Isoetes piedmontana	Piedmont quillwort	G3

[1]This species has been documented in an adjacent county and may occur in this county.

February 8, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

HENRICO COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica[2]	Sensitive joint-vetch	LT
Helonias bullata	Swamp pink	LT
Isotria medeoloides[3]	Small whorled pogonia	LT

Species of Concern

INVERTEBRATES		
Fusconaia masoni	Atlantic pigtoe	G2
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[1]	Marsh senna	G5T2
Juncus caesariensis	New Jersey rush	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the James River.
[2]This species has been documented in an adjacent county and may occur in this county.
[3]This species has been documented in an adjacent county and may occur in this county east of I-295.

May 29, 2001
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

CHESTERFIELD COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
INVERTEBRATES		
Alasmidonta heterodon[2]	Dwarf wedgemussel	LE
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT
Rhus michauxii[2]	Michaux's sumac	LE

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Speyeria diana	Diana fritillary	G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma	Marsh senna	G5T2
Desmodium ochroleucum	Creamflower tick-trefoil	G2G3
Trillium pusillum var virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county, concentrated shoreline use has been documented on the James River

[2]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

SPOTSYLVANIA COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedge mussel	LE
VASCULAR PLANTS		
Isotria medeoloides	Small whorled pogonia	LT

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Sigara depressa	Virginia Piedmont water boatmen	G1G3
Speyeria idalia	Regal fritillary	G3
NON-VASCULAR PLANTS		
Sphagnum carolinianum	Carolina peatmoss	G3

April 5, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CAROLINE COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica[2]	Sensitive joint-vetch	LT
Helonias bullata	Swamp pink	LT
Isotria medeoloides	Small whorled pogonia	LT

Species of Concern

BIRDS		
Aimophila aestivalis	Bachman's sparrow	G3
INVERTEBRATES		
Sigara depressa	Virginia piedmont water boatman	G1G3
Stygobromus indentatus	Tidewater amphipod	G2G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[2]	Marsh senna	G5T2
Desmodium ochroleucum	Creamflower tick-trefoil	G2G3
Eriocaulan parkeri	Parker's pipewort	G3
Juncus caesariensis	New Jersey rush	G2
Sabatia kennedyana	Plymouth gentian	G3

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the Rappahannock River.
[2]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

ORANGE COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
None documented		

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green Floater	G3
Speyeria idalia	Regal fritillary	G3

March 22, 1999
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

CULPEPER COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT
INVERTEBRATES		
Alasmidonta heterodon[1]	Dwarf wedgemussel	LE

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
VASCULAR PLANTS		
Agalinis auriculata[1]	Earleaf foxglove	G3

[1]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

FAUQUIER COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedgemussel	LE

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus spinosus	Blue Ridge Mountain amphipod	G2G3
VASCULAR PLANTS		
Agalinis auriculata[1]	Earleaf foxglove	G3
Carex polymorpha[1]	Variable sedge	G2G3
Carex schweinitzii[1]	Schweinitz's sedge	G3
Poa paludigena	Bog bluegrass	G3
Pycnanthemum torrei	Torrey's mountain-mint	G2

[1]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U.S Fish and Wildlife Service, Virginia Field Office

CITY OF HOPEWELL, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT

May 21, 2002
Prepared by U S. Fish and Wildlife Service, Virginia Field Office

Appendix F

GEIS Environmental Issues Not Applicable to North Anna Power Station, Units 1 and 2

Appendix F

GEIS Environmental Issues Not Applicable to North Anna Power Station, 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) (NRC 1996; 1999)[a] and 10 CFR Part 51, Subpart A, Appendix B, Table B-1, that are not applicable to North Anna Power Station, Units 1 and 2 because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to North Anna Power Station, Units 1 and 2

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	Issue applies to a saltwater receiving water body, that North Anna does not have.
Water-use conflicts (plants with cooling ponds or cooling towers using makeup water from a small river with low flow)	2	4.3.2.1 4.4.2.1	North Anna cooling systems do not use makeup water from a small river with low flow.
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.3.3	North Anna does not dissipate heat using cooling towers.
Impingement of fish and shellfish	1	4.3.3	North Anna does not dissipate heat using cooling towers.

(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.

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
Heat shock	1	4.3.3	North Anna does not dissipate heat using cooling towers.
GROUNDWATER USE AND QUALITY			
Groundwater use conflicts (potable and service water, and dewatering; plants that use >100 gpm)	2	4.8.1.1 4.8.2.1	NAPS uses <100 gpm of groundwater.
Groundwater-use conflicts (plants using cooling towers withdrawing makeup water from a small river)	2	4.8.1.3 4.4.2.1	North Anna does not dissipate heat using cooling towers.
Groundwater-use conflicts (Ranney wells)	2	4.8.1.4	North Anna does not have or use Ranney wells.
Groundwater quality degradation (Ranney wells)	1	4.8.2.2	North Anna does not have or use Ranney wells.
Groundwater quality degradation (saltwater intrusion)	1	4.8.2.1	North Anna is located inland.
Groundwater quality degradation (cooling ponds in salt marshes)	1	4.8.3	North Anna does not have cooling ponds in salt marshes.
Groundwater quality degradation (cooling ponds at inland sites)	2	4.8.3	North Anna does not use cooling ponds.
TERRESTRIAL RESOURCES			
Cooling tower impacts on crops and ornamental vegetation	1	4.3.4	North Anna does not dissipate heat using cooling towers.
Cooling tower impacts on native plants	1	4.3.5.1	Issue applies to a heat dissipation system feature, cooling towers, that NAPS does not have.

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
Bird collisions with cooling towers	1	4.3.5.2	Issue applies to a heat dissipation system feature, cooling towers, that NAPS does not have.
Cooling pond impacts on terrestrial resources	1	4.4.4	North Anna does not use cooling ponds.

F.1 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Volumes 1 and 2, 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, Final Report'." NUREG-1437, Volume 1, Addendum 1, NRC, Washington, D.C.

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202

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(See instructions on the reverse)

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Regarding North Anna Power Station, Units 1 and 2
Final Report

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

9 SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U S Nuclear Regulatory Commission, and mailing address)*

Same as 8 above

10 SUPPLEMENTARY NOTES

Docket Numbers 50-338, 50-339

11. ABSTRACT *(200 words or less)*

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC on May 29, 2001, by the Virginia Electric and Power Company (VEPCo) to renew the operating licenses for North Anna Power Station, 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's recommendation is that the Commission determine that the adverse environmental impacts of license renewal for North Anna Power Station, 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 Plants (NUREG-1437); (2) the Environmental Report submitted by VEPCo; (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)*

North Anna Power Station, Units 1 and 2
North Anna
Supplement to the Generic Environmental Impact Statement
GEIS
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NEPA
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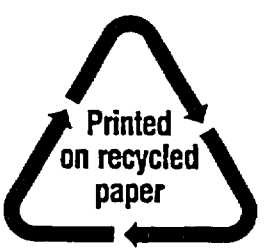

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