RAS 8116

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July 2, 2004

By Electronic Mail and U.S. Mail

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G. Paul Bollwerk III, Chairman
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Administrative Judge
Dr. Paul B. Abramson
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Administrative Judge
Dr. Anthony J. Baratta
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: DOMINION NUCLEAR NORTH ANNA, LLC
(Early Site Permit for North Anna ESP Site)
Docket No. 52-008; ASLBP No. 04-822-02-ESP

Gentlemen:

This letter is inform you that on June 28, 2004, Dominion Nuclear North Anna, LLC (Dominion) provided a letter to the NRC Staff addressing the February 10, 2004 comments of the Virginia Department of Environmental Quality (VDEQ). A copy of Dominion's June 28, 2004 letter is attached. Dominion is providing this notification because Petitioners referred to the VDEQ comments in their proposed contentions on aquatic impacts. Dominion's June 28, 2004 letter does not alter Dominion's answer to Petitioners' contentions, and is provided only to keep the Board and Petitioners informed of pertinent developments related to the proposed contentions.

Very truly yours,

David R. Lewis
Counsel for Dominion Nuclear North Anna, LLC

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SECY-02

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Dominion®

June 28, 2004

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 04-364
ESP/LTB
Docket No. 52-008

DOMINION NUCLEAR NORTH ANNA, LLC
NORTH ANNA EARLY SITE PERMIT APPLICATION
RESPONSE TO VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY COMMENT LETTER

On November 6, 2003, Dominion Nuclear North Anna, LLC (Dominion) submitted a Federal Consistency Certification under the Coastal Zone Management Act (CZMA) and Virginia Coastal Resources Management Program to the Virginia Department of Environmental Quality (VDEQ). The action was taken in support of Dominion's September 25, 2003 submittal to the NRC of the North Anna Early Site Permit application. At the request of the VDEQ, Dominion withdrew its request for CZMA certification on January 12, 2004, in order to coordinate the State's period for review and concurrence of this certification with the NRC publishing its Draft Environmental Impact Statement.

However, during the preceding interval before Dominion withdrew its request, a number of state agencies had expended considerable resources reviewing Dominion's November 6, 2003 submittal. Although incomplete, these reviews had generated a number of comments. Those comments were forwarded to Dominion by VDEQ on February 10, 2004.

Dominion has reviewed these advance comments from various state agencies and has addressed each of the comments with further information or clarifications. The comments and how each was dispositioned are provided in the enclosure.

It is our intent to update the North Anna ESP application to incorporate our responses to these advance comments and support issuance of the NRC staff's draft safety and environmental evaluations scheduled for later this year. These additions and clarifications are identified following the response to each comment.

If you have any questions or require additional information, please contact us.

Very truly yours,

Eugene S. Grecheck
Vice President-Nuclear Support Services

Enclosure: Response to Virginia DEQ Comments

Commitments made in this letter:

1. Revise North Anna ESP application to incorporate responses to advance VDEQ comments.

cc: U.S. Nuclear Regulatory Commission, Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. Jack Cushing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. M. T. Widmann
NRC Senior Resident Inspector
North Anna Power Station

Ms. Ellie L. Irons, Program Manager
Office of Environmental Impact Review
Virginia Department of Environmental Quality

Serial No. 04-364
Docket No. 52-008
Response to VDEQ Comments

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President, Nuclear Support Services, of Dominion Nuclear North Anna, LLC. He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of Dominion Nuclear North Anna, LLC, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 28th day of June, 2004

My Commission expires: 3/31/08

Maggie McClure
Notary Public

(SEAL)

Enclosure 1

Response to February 10, 2004 Virginia Department of Environmental Quality Comment Letter On the North Anna ESP Application Coastal Zone Certification

VDEQ Comment on Deficiencies in the Document

Deficiencies in the Document

The Application includes proposed Unit 4, but does not identify a source of water for that unit. The NRC regulations, at 10 CFR section 51.29, require that "information provided to the Commission by an applicant for a license, ... shall be complete and accurate in all material respects." For ESP applications, the NRC requires information on "types of cooling system intake and outflows for **each** facility" (10 CFR section 52.17(v)) (emphasis added). Because no water source for Unit 4 is identified in the Application, DEQ's Water Division cannot form an opinion on prospects for approval of such a project, or whether it would be consistent with state laws and regulations. The logical water source for Unit 4 would be Lake Anna. Groundwater resources are not capable of producing the large quantities of water that would be needed; nor does there appear to be any surface water source nearby, other than the Lake. Unit 4 should be withdrawn from the Application unless its water source(s) and related cumulative impacts are identified. If Dominion leaves Unit 4 in the Application, but does not identify a water source, then NRC should consider denying the application for any site redress work associated with Unit 4.

If Lake Anna were the source of water identified for Unit 4, the additional heat load and evaporative losses would result in deeper and longer drawdown periods on the Lake and longer periods of low flows in the North Anna River. Given the small watershed, with average runoff of only 370 cubic feet per second (cfs), it is probable that the additional cumulative impact of a fourth unit would have an unacceptable impact on the Lake and the River downstream of it.

Response

The Environmental Report (ER) indicates that cooling tower makeup water necessary to replace the water lost to evaporation from the Unit 4 cooling towers would be obtained from Lake Anna and supplemented, as necessary, from an outside source to maintain acceptable lake levels. The ER does not identify this outside source. To eliminate uncertainty concerning the adequacy of the Unit 4 makeup water sources, Dominion decided to revise the ESP application to change the base case for heat dissipation for Unit 4 from wet cooling towers to dry towers. This revision from wet to dry cooling towers for Unit 4 eliminates the need for obtaining makeup water from Lake Anna or from another external source.

Dominion notified the NRC of plans to use dry towers for Unit 4 in a letter dated March 31, 2004 (Reference 1). As stated in the same letter, the Unit 3 cooling water approach is unchanged. Options for Unit 3 cooling are evaluated in ER Section 9.4.1.1, which concludes that once-through cooling is the environmentally and economically preferable heat dissipation system.

References

1. March 31, 2004 Letter from Eugene S. Grecheck, Vice President-Nuclear Support Services, Dominion, to U. S. Nuclear Regulatory Commission, Document Control Desk, "Dominion Nuclear North Anna, LLC, North Anna Early Site Permit Application, Revised Approach for Unit 4 Normal Plant Cooling," NRC Accession Number ML040980485.

Application Revision

SSAR Section 2.4 and ER Sections 1, 2, 3, 5, 9, and 10 will be revised to reflect the change in the Unit 4 cooling approach from wet towers to dry towers.

VDEQ Comment F1(a)

1. Fisheries Management Concerns. As the Department of Game and Inland Fisheries (DGIF) indicates (enclosed comments), the proposed addition of two generating units to the two that are already operating at the North Anna Power Station would have a number of adverse effects upon the lake and the river downstream of it.

(a) Water Withdrawal Increases in the Lake. Increases in water withdrawals would present complications for fish populations through increased fish impingement and entrainment in water intakes. Impingement, or the collisions of fish against water intake screens, would increase by 230% over current levels with the addition of the proposed intakes, according to DGIF. Estimated impingement mortality of striped bass would nearly double; it should be mentioned that striped bass is a leading Lake Anna sportfish annually stocked by DGIF.

Similarly, the number of fish entrained by virtue of increased water withdrawals from the Lake is expected to increase. Using estimates from the applicant's six-species category, DGIF states that the number of fish lost to entrainment could exceed 468 million fish annually, 63% of which would be gizzard shad, another important North Anna River species. (Confirmed, Ellis/Odenkirk, 2/9/04. The lower estimate by DEQ's Office of Wetlands and Water Protection is a sub-set of the above estimate; it is based on losses attributable to the addition of Unit 3 only (Ellis/Hassell, 2/9/04).

Existing intake criteria at the North Anna Power Station substantially exceed DGIF recommendations, as the chart shows:

	water velocity (feet per second)	screen mesh (millimeters)
DGIF recommendation	0.25 FPS	1.0 mm
existing criteria	0.70 FPS	9.5 mm

DGIF indicates that even its recommendations, which reflect current state-of-the-art technology, are not expected to provide full resource protection. The existing screen would be expected to exclude only compressed fish (such as sunfish) larger than 50 mm and elongated fish (such as striped bass and largemouth bass) larger than 86 mm. Accordingly, DGIF recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations.

Response

As stated in Environmental Report (ER) Section 5.3.1.2, increases in water withdrawal associated with the implementation of Unit 3 and Unit 4 would result in increased impingement and entrainment. However, Dominion disagrees with the VDEQ statement that these withdrawals "would present complications for fish populations." Dominion presented a thorough analysis of the impacts of impingement and entrainment in the ER, using available data from the Section 316(b) Demonstration (May 1985), *Impingement and Entrainment Studies for North Anna Power Station, 1978-1983* and its original data (Reference 4 of ER Section 5.3). These data were deemed representative of the current fish community in Lake Anna and provided a basis for extrapolating impingement and entrainment estimates with assumptions as presented in ER Sections 5.3.1.2.1 through 5.3.1.2.5.

Assumptions for impingement were:

- Fish distribution and composition have remained generally the same as in the 1978-1983 study
- A new once-through CWIS would operate at 100 percent pumping capacity
- The intake screen mesh size and approach flow velocity of the new units would be the same as that of the existing units.

Assumptions for entrainment were:

- Fish distribution and composition have remained generally the same as in the 1978-1983 study
- A new once-through CWIS would operate at 100 percent pumping capacity
- The intake screen mesh size and approach velocity of the new units would remain the same as that of the existing units

Using these assumptions, an analysis of the implications of increasing withdrawal rates for new units on impingement and entrainment was done and the results presented in the ER. ER Section 5.3.1.2.2 states that adding an additional once-through unit with conservative assumptions (i.e., worst case) would double the number of fish impinged. The VDEQ statement that impingement would increase by 230% over current levels with the addition of the proposed intakes is misworded. A more accurate way to present this percentage increase is that while 422,027 fish (estimated impinged annually from current operations and Unit 3) is 230% of 187,440 fish (estimated impinged annually by current operations), increasing impinged organisms from 187,440 to 422,027 is a 131% increase in impingement rates. One needs to keep in mind that the estimated impingement rates for the new unit represent a conservative "worst case" and actual impingement could be significantly less because the units would not operate at 100 percent pumping capacity year round. In addition, this increase in impingement is estimated to be 63 percent gizzard shad, a prolific forage fish.

The statement that impingement mortality of striped bass, a leading sportfish that is annually stocked by VDGIF, would nearly double needs to be put into perspective. Total estimated impingement from a new once-through unit for striped bass is estimated (with the assumptions presented above) to be 2,354 annually or approximately 1% of the estimated 239,587 fish impinged annually. Based on VDGIF reports, an average of 134,000 striped bass were stocked annually in Lake Anna over the 1992-2002 time period. Striped bass are not native to Lake Anna or the North Anna River and are present only due to stocking by VDGIF.

Dominion presented an analysis and discussion of entrainment in the ER based on the assumptions identified above. VDEQ references the VDGIF letter of January 27, 2004 that estimated 468 million fish would be entrained annually. Dominion believes that this number is an overestimate. Our analysis estimates that 300 million fish would be entrained with a total of four units operating under the conservative assumptions presented earlier. ER Table 5.3-5 (current operations), Table 5.3-6 (Unit 3), and Table 5.3-8 (Unit 4) represent "worst case" entrainment estimates, and, as noted for impingement, actual numbers entrained would likely be significantly less.

VDEQ states that existing NAPS intake parameters substantially exceed VDGIF recommendations for water velocity, 0.25 fps, and screen mesh size, 1 mm, which are more stringent than EPA's proposed requirements for Section 316(b). The precise status of the EPA and state requirements are uncertain at this time and they may undergo further revision before Dominion makes a decision to apply for a COL and an NPDES permit for new units. Dominion understands that the state may impose requirements that are more stringent than EPA and that these requirements might reduce the intake impacts that Dominion has identified in the ER. However, Dominion believes that its conservative ("worst case") analysis in the ER bounds any possible impacts. More stringent requirements could only further reduce impacts. Dominion has committed in ER Section 3.4.2.1 to comply with Section 316(b) of the Clean Water Act and its applicable implementing regulations.

Regarding the recommendation that Dominion investigate further the addition of a submerged intake structure, the design of the intake structure would be reviewed by VDEQ in support of a 316(b) determination, if Dominion decides to proceed with development of new units. As stated in ER Section 5.3.1.2.5, a curtain wall might mitigate increased water temperatures, significantly reduce impingement, and reduce entrainment and as such, is a reasonable mitigation option that would be explored further.

In summary, because of the size of the fish populations in Lake Anna (based on annual sampling conducted by VDGIF and discussed in ER Section 2.4.2), the fecundity of the most frequently impinged representative important fishes (analyzed in the 316(b) study), the assumptions presented for impingement and entrainment estimates in the ER, and the ability of aquatic populations to accommodate environmental perturbations, Dominion concluded that doubling impingement estimates for the representative important species analyzed in the ER would not affect the fish community in Lake Anna sufficiently to require mitigation (reference ER Sections 5.3.1.2.2 and 5.3.1.2.4).

Application Revision

None.

VDEQ Comment F1(b)

1. Fisheries Management Concerns (continued)

(b) Water Withdrawal Increases and the River Downstream. The addition of one or two new units to the North Anna Power Station would have significant impacts on downstream resources by reducing river flows and the frequency of higher flows. For example, the water budget presented in the Application shows that significant changes in flows have already taken place as a result of the construction of the dam; drought flow frequency (flows less than 20 cfs) occurs 5.3% of the time now, versus 4.2% of the time before the dam was built (1929-1971). Drought flow frequency would rise to 11.8% of the time with one additional unit; the flow analysis did not address what would happen with a fourth unit. The impact of a fourth unit should be addressed in this process, or else the fourth unit should be taken out of the permit application.

DGIF recommends an In-stream Flow Incremental Methodology (IFIM) Study as a means of determining flow recommendations downstream of the Lake. The study should include evaluation of a habitat time series (i.e., pre-project, current, and proposed conditions) for native and naturalized species, and may result in recommendations for different flow operating rules than currently exist for the downstream resource. The Tennant Method yields a summer flow in the range of 74 to 111 cfs for resource protection, and current minimum flows would be rated as poor to degraded in that regard. As DEQ's Office of Wetlands and Water Protection states, the addition of another generating unit, which is expected to increase the consumptive loss from the watershed by an additional 39 cfs, would create nearly perennial conditions of severe degradation every fall. See "Additional Analysis Needs," item 4, below.

<u>Response</u>

The ER indicates that cooling tower make-up water necessary to replace the water lost to evaporation from the Unit 4 cooling towers would be obtained from Lake Anna and supplemented, as necessary, from an outside source to maintain acceptable lake levels. The ER does not identify this outside source. To eliminate uncertainty concerning the adequacy of the Unit 4 make-up water sources, Dominion decided to revise the ESP application to change the base case for heat dissipation for Unit 4 from wet cooling towers to dry towers. Dry tower systems typically have no evaporative water losses, require no make-up water to replace evaporative losses, and have no blowdown discharge compared to mechanical draft (or natural draft) cooling towers. In the event that the secondary cooling water loop of the dry tower system selected incorporates a pump sump with a free water surface, a small amount of evaporation will occur. The evaporation from this surface has been estimated to be on the order of 1 gpm (0.002 cfs).

This revision from wet to dry cooling towers for Unit 4 eliminates the need for obtaining makeup water from Lake Anna or from another external source. Consumptive surface water use for Unit 4 would decrease from about 36 cfs to less than 2 cfs under normal operating conditions. With this revision, there is no need to include Unit 4 in the water budget analysis.

Dominion notified the NRC of plans to use dry towers for Unit 4 in a letter dated March 31, 2004 (Reference 1). The same letter indicates that the North Anna ESP application will be revised to reflect this change.

Dominion notes that the Tennant Method was developed for application to western United States coldwater streams. Historically, summer flows in the North Anna River prior to impoundment generally were much lower than 74 cfs, and sometimes less than 20 cfs. Downstream river flows have never been below 20 cfs since impoundment. Dominion understands the recommendation for an instream flow study to protect aquatic life. However, long-term monitoring of the North Anna River has documented improvements in the abundance and diversity of aquatic biota since impoundment. Further, a diverse and stable fish assemblage has persisted since impoundment under existing instream flow regulations, including the most recent passed by the Virginia General Assembly in 2001. At this time, Dominion does not see an additional in-stream flow monitoring study as necessary.

Note also that the VDEQ's comment identifies that the addition of another generating unit would be expected to increase the consumptive loss from the watershed by an additional 39 cfs. Dominion would like to clarify that the additional evaporative loss associated with Unit 3 is estimated to be 29 cfs (not 39 cfs) during normal plant operation as is described in ER Section 5.2.1.1. On a long-term operating basis, the additional evaporative loss is slightly less (28 cfs) as discussed in ER Section 5.2.1.4.

See also the responses to VDEQ Comments F2(a) and F2(c).

References

1. March 31, 2004 Letter from Eugene S. Grecheck, Vice President-Nuclear Support Services, Dominion, to U. S. Nuclear Regulatory Commission, Document Control Desk, "Dominion Nuclear North Anna, LLC, North Anna Early Site Permit Application, Revised Approach for Unit 4 Normal Plant Cooling," NRC Accession Number ML040980485.

Application Revision

SSAR Section 2.4 and ER Sections 1, 2, 3, 5, 9, and 10 will be revised to reflect the change in the Unit 4 cooling approach from wet towers to dry towers.

VDEQ Comment F1(c)(i)

1. Fisheries Management Concerns (continued)

(c) Water Temperature Increases. Water temperature increases resulting from the additional units are likely to affect fish habitat in Lake Anna and in the North Anna River. This issue has several aspects.

(i) Present Conditions. Dominion has documented the current situation and available literature (Application, pages 3-5-55 through 3-5-58). The current temperature and oxygen stratification patterns at the Lake limit the potential of the Lake fishery, but have not resulted in catastrophic fish kills to date. Adult striped bass grow slowly, exhibit reduced fitness, and have low maximum sizes as a result of the present marginal habitat conditions, but an important recreational fishery has nonetheless developed in this habitat. The Lake does not often stratify, but when it does the stratification is weak. Total temperature differences (top to bottom) in many cases were less than 1 degree Celsius (1.8 degrees Fahrenheit) based on DGIF samples taken in late summer and early fall at lower reservoir sites. Stratification patterns dictate striped bass habitat and are subject to much variability at Lake Anna. Accordingly, a horizontal and vertical increase in the thermal plume would exacerbate a currently tenuous situation.

__Response__

Dominion does not agree that a "tenuous situation" exists in Lake Anna or that a small additional stressor could have a catastrophic effect. We believe the following statements are true and verifiable:

- Lake Anna striped bass provide an important recreational fishery
- Lake Anna striped bass occupy habitat that is "marginal"
- Lake Anna striped bass grow slowly as adults, exhibit reduced fitness, and do not reach sizes seen in other southeastern reservoirs
- Lake Anna striped bass, like striped bass in many southeastern reservoirs, face a late-summer habitat squeeze
- No major striped bass die-offs have been observed in Lake Anna, even during the height of the 1998-2002 drought

We have seen no hard evidence that a "tenuous situation" currently exists or that the population is likely to collapse as the result of a modest additional thermal input.

With regard to striped bass habitat, Dominion acknowledges in the ER that increases in water temperatures could have a "moderate" impact on non-native striped bass, which have more demanding habitat requirements than native game fish (black bass, crappies, lepomids) and forage fish (shad and minnows). Striped bass do not spawn in the Lake Anna watershed and must be stocked to maintain their numbers. Striped bass in reservoirs across the southeast are subject to thermal stress and habitat restriction in drought years, even in reservoirs that do not receive thermal inputs from power plants. Late-summer movements of striped bass to cooler refuge areas have been observed in reservoirs from Alabama to North Carolina, with sporadic die-offs of larger, older fish in some reservoirs in particularly hot and dry summers.

Dominion believes, based on more than 20 years of water quality and fisheries monitoring, that Lake Anna currently supports a healthy, balanced indigenous fish community and will continue to support a healthy, balanced indigenous fish community with the additional heat input that would be expected with a third once-through unit. Warmwater fish species native to the southeastern U.S., such as largemouth bass, black crappie, bluegill, channel catfish, and white catfish, are able to tolerate water temperatures predicted in Lake Anna under 3-unit operation without experiencing any ill effects. There are documented instances of these species flourishing in cooling ponds and cooling reservoirs that receive thermal effluent in excess of 100°F (see Table 1). A short list of cooling ponds and reservoirs with summer (surface) water temperatures in the 95-105°F range would include Par Pond (SC) at the Savannah River Site; Monticello Reservoir (SC), the cooling reservoir for SCE&G's V.C. Summer Nuclear Station; Lake Robinson (SC), the cooling pond for Progress Energy's H.B. Robinson Nuclear Plant; Lake Norman (NC), the cooling reservoir for Duke Energy's McGuire Nuclear Station and Marshall Steam Station; and Keowee Reservoir, the cooling reservoir for Duke Energy's Oconee Nuclear Station. ER Section 5.3.2.2.c.1 contains a discussion of the Mt. Storm Lake (WV) fish community, which by all accounts is thriving in spite of late-summer water temperatures in the discharge area that can exceed 99°F. This 1,200-acre impoundment serves as the cooling water source for Dominion Energy's Mt. Storm Power Station.

In these cooling reservoirs, fish simply move in summer to portions of the reservoir that are less affected by the thermal discharge. These include deeper, cooler portions of the water body, arms of the pond/reservoir that receive cool flows from tributary streams, and thermal refuges created by subaqueous springs and seeps. It should be noted that in winter, elevated temperatures in the discharge areas of these cooling reservoirs often attract large numbers of baitfish, gamefish, and fishermen. Olmsted and Clugston (1986) (Reference 7) discuss the opportunities (e.g., extended growing season, enhanced primary and secondary productivity, improved winter-time fishing) and challenges (e.g., sub-optimal habitat for top-of-the-food chain predators, such as striped bass; stimulation of nuisance aquatic weeds) that these southeastern cooling reservoirs present to fisheries managers.

Table 1. Power Plant Cooling Ponds

Reservoir	Surface Area	Owner/ Manager	Power Plant	Cooling System	Discharge Temperatures/ Reservoir Temperatures	Important Gamefish	Source(s)
Par Pond	2,500 acres	DOE	Received heated effluent from nuclear production reactors until 1988.	Series of pre-cooler ponds.	Ranged from 59-111°F in 1985 in area of "Hot Dam" (where heated effluent entered reservoir), when one reactor (P Reactor) was running	Largemouth bass, black crappie, bluegill, redbreast sunfish, chain pickerel	Reference 1
Monticello Reservoir	6,000 acres	SCE&G	VC Summer Nuclear Station, single unit nominally rated at 1,000 MWe	Once-through; discharge canal configuration and jetty designed to direct thermal plume north/uplake and prevent recirculation to intake.	NPDES permit discharge limit (end of pipe) is 113°F. Temperatures outside of discharge canal as high as 103.7°F	Largemouth bass, black crappie, bluegill, white bass, white catfish, channel catfish, blue catfish	Reference 2
Lake Robinson	2,250 acres	Progress Energy	H.B. Robinson Nuclear Plant, single unit nominally rated at 700 MWe	Once-through to Lake Robinson; 4.0-mile-long discharge canal intended to dissipate heat prior to entering Lake Robinson.	NPDES discharge limit (June-Sept. daily max) is 111.2°F; highest temp. recorded in impoundment is 105.8°F	Largemouth bass, black crappie, bluegill, warmouth, yellow bullhead	Reference 3

Table 1. Power Plant Cooling Ponds

Reservoir	Surface Area	Owner/ Manager	Power Plant	Cooling System	Discharge Temperatures/ Reservoir Temperatures	Important Gamefish	Source(s)
Lake Norman	32,150 acres	Duke Power	McGuire Nuclear Station (two units, each 1,129 MWe) and Marshall Steam Station	Once-through to Lake Norman; 0.6 mi. long discharge canal.	NPDES discharge limit is 95°F for Oct.-June and 99°F for July-Sept; monthly average discharge temp. in August is 98.2°F.	Striped bass, largemouth bass, black crappie, white bass, several Lepomid spp., and blue catfish.	Reference 4
Keowee Reservoir	18,500 acres	Duke Power	Oconee Nuclear Station, three units rated at 887 MWe each	Once-through to Keowee Reservoir; skimmer wall on intake side promotes withdrawal of deeper, cooler water for condenser cooling.	NPDES discharge limit is 100°F; from 1973-1993, maximum daily average temperature in discharge canal was 98.4°F	Spotted bass, largemouth bass, black crappie, bluegill, redear sunfish, white catfish	References 5 and 6

References

1. E. I. duPont de Nemours & Company (duPont). 1985. Compliance of the Savannah River Plant P-Reactor Cooling System with Environmental Regulations: demonstrations in accordance with Sections 316(a) and (b) of the Federal Pollution Water Control Act of 1972. Prepared for the U. S. Dept. of Energy by duPont's Savannah River Laboratory.

2. South Carolina Electric & Gas Company. 2002. Applicant's Environmental Report --- Operating License Renewal Stage, V. C. Summer Nuclear Station.

3. Progress Energy. 2002. Applicant's Environmental Report --- Operating License Renewal Stage, H. B. Robinson Steam Electric Plant, Unit 2.

4. Duke Energy. 2001. Applicant's Environmental Report --- Operating License Renewal Stage, McGuire Nuclear Station.

5. Duke Energy. 1998. Applicant's Environmental Report --- Operating License Renewal Stage, Oconee Nuclear Station.

6. NRC. 1999. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 2. Regarding Oconee Nuclear Station. Office of Nuclear Reactor Regulation, Washington, DC.

7. Olmsted, L. L. and J. P. Clugston. 1986. Fishery Management in Cooling Impoundments. Pg. 227-237 in G. E. Hall and M. J. Van Den Avyle, editors, *Reservoir Fisheries Management: Strategies for the 80s.* Reservoir Committee, Southern Division American Fisheries Society, Bethesda, MD.

Application Revision

None.

VDEQ Comment F1(c)(ii)

1. Fisheries Management Concerns (continued)

(c) Water Temperature Increases (continued)

(ii) Impacts of Water Temperature Increases; Mitigation. It is likely that a small increase in reservoir water temperature would have a dramatic effect, further reducing already limited habitat and perhaps jeopardizing the entire striped bass fishery. The maximum daily surface temperature is expected to rise by 7.2 degrees Fahrenheit (4 degrees Celsius) near the dam as a consequence of the proposed new generating units. Re-configuring the flow within the waste heat treatment facility (WHTF) to allow for more efficient cooling (i.e., forcing water to use the entire facility, consisting of three cooling lagoons, by sealing the lower tributary arm between Elk Creek and Millpond Creek and cutting a canal through the headwater areas; Ellis/Kauffman, 2/6/04) would expand the residence time within the WHTF and probably reduce thermal impacts to Lake Anna and the North Anna River.

<u>Response</u>

ER Section 5.3.2.1.2 describes the predicted thermal impacts for the following three scenarios:

1. Operation of the once-through cooling systems of the existing units;

2. Future combined operation of the once-through cooling systems of the existing units, a once-through cooling system for Unit 3, and a closed-cycle cooling system for Unit 4; and

3. Future combined operation of the once-through cooling systems of the existing units, a once-through cooling system for Unit 3, and a once-through cooling system for Unit 4.

ER Table 5.3-17 summarizes for various Lake Anna locations the predicted maximum daily surface temperature increases associated with the addition of one new once-through cooling system (Scenario 2) and two new once-through cooling systems (Scenario 3). The predicted maximum surface temperature increase at the dam for the Scenario 2, the base case cooling scenario, is 3.6 degrees Fahrenheit (2 degrees Celsius) and not 7.2 degrees Fahrenheit (4 degrees Celsius) as indicated in the VDEQ comment. Given that Unit 4 would have no thermal impact on the lake with either a closed-cycle cooling system using wet cooling towers, as was initially planned, or dry cooling towers, as is currently specified, the VDEQ's use of a 7.2 degrees Fahrenheit temperature increase incorrectly overstates the thermal impacts to the lake. Furthermore, it is predicted that the maximum daily surface temperature at the dam for

Scenario 1 of 93.3 degrees Fahrenheit is exceeded only about 1.6% of the time for Scenario 2. These results indicate that the addition of Unit 3's once-through cooling system would result in a surface temperature at the dam higher than the current daily maximum for about 6 days out of the year on average, which is a relatively small duration.

Dominion agrees that re-configuring the WHTF as described in the VDEQ's comment would increase the residence time and promote more efficient cooling. However, as described in ER Section 9.4.1.1.3.a.1, the construction work to connect the headwaters of the Elk Creek and Millpond Creek arms of the WHTF would be expensive and disruptive to nearby residential areas, as large diameter tunnels or major canals would be required. Based on cooling pond simulations, the expected improvements in intake temperatures would be in the 0.5-1.0 degree Fahrenheit range. ER Section 9.4.1.1.3.a.1 concludes that, because this level of mitigation could be achieved more economically in other ways, the combination of high costs and construction impacts results in this option being eliminated from further consideration.

Application Revision

None.

VDEQ Comment F1(d)

1. Fisheries Management Concerns (continued)

(d) Alternatives. Given the scope and magnitude of aquatic resource impacts anticipated in the event of building out the two units, it seems prudent, *according to the Department of Game and Inland Fisheries, to investigate* alternatives to the heavily consumptive proposal of another once-through system and a new wet cooling tower. See "Additional Analysis Needs," item 2, below. One alternative, addressing the conflict between consumptive use and impingement and entrainment, would be to consider a single new reactor using a cooling tower with Lake Anna as its source water (see item 3(b)(ii), below). The Draft EIS should include a thorough analysis of this and other alternatives to the proposed project.

Response

The ER already evaluates alternative heat dissipation systems for Units 3 and 4. These alternatives are described and evaluated in ER Section 9.4.1 and include natural draft and mechanical draft cooling towers. With Dominion's decision to use dry cooling towers for Unit 4 [see the response to VDEQ Comment F1(b)], the VDEQ's recommendation to consider a single new reactor using a cooling tower with the lake as its source of water is effectively addressed in the current ER. Further, ER Table 9.4-1 indicates that the overall evaporative losses would be greater for wet cooling tower systems compared to once-through cooling systems. The evaporative losses associated with the addition of Unit 3 are estimated to be 29 cfs during normal plant operation, as described in ER Section 5.2.1.1. If a wet cooling tower were used for Unit 3, the evaporative losses would be about 35 cfs during normal plant operation, based on information included in the same section. Therefore, use of a wet cooling tower system for Unit 3 in lieu of a once-through system would have greater impact on lake levels and downstream releases.

With respect to impingement and entrainment, any intake structure, including one for a once-through cooling system, would be required to meet Section 316(b) of the CWA and the implementing regulations, as applicable.

Application Revision

None.

VDEQ Comment F2(a)

2. Wetland Management and Water Resources. DEQ's Water Division indicates that additional studies on the impacts to in-stream beneficial uses, water quality, and aquatic life would be needed to adequately assess the impacts of the proposed new generating units. Preservation of in-stream flows for protection of fish and wildlife habitat and resources and also recreation values is a beneficial use of state waters. Habitat and recreational uses are present in both the Lake and downstream, in the North Anna and Pamunkey Rivers. Conditions in a Virginia Water Protection Permit may include, but are not limited to, the volume of water to be withdrawn as part of the permitted activity.

(a) Consumptive Use and In-stream Flow. An additional unit of the size contemplated in the Application would be the largest single consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program. The average annual flow of Lake Anna and the North Anna River is 370 cfs. The typical recommendation to the Water Division from the Department of Game and Inland Fisheries, in processing a Water Protection Permit, is not to allow cumulative consumptive use to exceed 10% of the river's flow. The current evaporation rate and the existing two generating units very often exceed this benchmark. Accordingly, permitting of additional withdrawals, even with prescriptive conditions, cannot be guaranteed.

For these reasons, DEQ's Office of Wetlands and Water Protection has recommended that Dominion withdraw its federal consistency certification, at least until such time as a Draft Environmental Impact Statement is available. Under the present circumstance, DEQ's Office of Wetlands and Water Protection could not agree with the certification that the project would be in compliance with the Enforceable Policies of the Virginia Coastal Resources Management Program, because that Office does not have the information necessary to allow such concurrence.

Response

The comment that an additional unit of the size contemplated in the ESP application would be the largest single consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program needs clarification for proper perspective. While the cooling water withdrawal contemplated for Unit 3 might be the largest withdrawal considered by the permit program, it should be noted the entire flow withdrawn from the North Anna Reservoir (up to 2540 cfs) would be returned to the reservoir via the Waste Heat Treatment Facility. The actual consumptive use of water would be the lake evaporation associated with the additional heat rejection from a new Unit 3. The additional evaporation has been estimated to be 28 cfs on a long-term operating basis as described in ER Section 5.2.1.4.

Nevertheless, Dominion understands the concern about consumptive use and in-stream flow. To eliminate uncertainty concerning the adequacy of the Unit 4 makeup water sources, Dominion decided to revise the ESP application to change the base case for heat dissipation for a new Unit 4 from wet cooling towers to dry towers. This revision from wet to dry cooling towers for Unit 4 eliminates the need for obtaining makeup water from Lake Anna or from another external source.

Consistent with the VDEQ request, Dominion notified the NRC of plans to use dry towers for Unit 4 in a letter dated March 31, 2004 (Reference 1). The same letter indicates that the North Anna ESP application will be revised to reflect this change.

Dominion has withdrawn its consistency certification and will resubmit it during the time period in which the Draft Environmental Impact Statement (EIS) is published and available for review and comment. This will allow the VDEQ time to review the Draft EIS while considering the consistency certification.

In addition to water withdrawal changes due to Unit 4 dry cooling, the response to VDEQ Comment AA1 indicates a mean annual flow of 265 cfs under current conditions and a mean annual flow of 240 cfs with the addition of a new Unit 3 (see Table 2, Non-Parametric IHA Scorecard, North Anna River). The resulting decrease in the mean annual flow would be 25 cfs, which would represent <u>less than a 10%</u> reduction in mean annual downstream flow. This result would fall within the VDGIF's recommendations for acceptable consumptive use.

<u>References</u>

1. March 31, 2004 Letter from Eugene S. Grecheck, Vice President-Nuclear Support Services, Dominion, to U. S. Nuclear Regulatory Commission, Document Control Desk, "Dominion Nuclear North Anna, LLC, North Anna Early Site Permit Application, Revised Approach for Unit 4 Normal Plant Cooling," NRC Accession Number ML040980485.

<u>Application Revision</u>

SSAR Section 2.4 and ER Sections 1, 2, 3, 5, 9, and 10 will be revised to reflect the change in the Unit 4 cooling approach from wet towers to dry towers.

VDEQ Comment F2(b)

2. *Wetland Management and Water Resources (cont'd)*

(b) Impingement and Entrainment. As mentioned above (item 1(a)), a once-through cooling process for Unit 3 will result in a significant addition to the number of aquatic organisms impinged (240,000) or entrained (148,000,000) every year (see item 1(a), above, for the Department of Game and Inland Fisheries (DGIF) estimate of the total losses with all units; this number is a subset of the DGIF estimate). While once-through cooling represents a cost saving over cooling towers, it results in higher impingement and entrainment losses. On the other hand, it has less consumptive loss per megawatt of electricity produced, because some of the heat in once-through cooling is dissipated by processes other than pure evaporation.

Response

See the response to VDEQ Comment F1(a).

Application Revision

See the response to VDEQ Comment F1(a).

VDEQ Comment F2(b)(I)

2. Wetland Management and Water Resources (continued)

(b) Impingement and Entrainment (continued)

(i) Permitting Questions. DEQ's Office of Wetlands and Water Protection and its Northern Virginia Regional Office would normally address impingement and entrainment through the Virginia Water Protection Permit. However, because the intake is for cooling water and will not be built for some time, the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. The new unit may be treated as an existing intake or a new intake under the section 316(b) regulations (see item 4 and also "Regulatory and Coordination Needs Summary," item 1, below).

__Response__

Dominion understands that impingement and entrainment issues will fall under the new EPA regulations pursuant to Section 316(b) of the Clean Water Act and will be addressed in the VPDES permit. Regulations now exist for new facilities (Phase 1) with cooling water intake structures at 40 CFR 125.80 et seq. as well as for existing facilities (Phase 2) at 40 CFR 125.90 et seq. The comment indicated some uncertainty whether the ESP project would be considered a new or existing facility under these regulations. It is Dominion's position that the regulations are clear that this project would fall under the Phase 2 existing facility rule due to the definitions provided in the regulations. The Phase 2 rule states in the definition of existing facility the following: "and any modification of, or any addition of a unit at such a facility that does not meet the definition of a new facility at section 125.83." The Phase 1 rule states in the definition of new facility the following:

> New facilities include only "greenfield" and "stand-alone" facilities. A greenfield facility is a facility that is constructed at a site at which no other source is located or that totally replaces the process or production equipment at an existing facility (see 40 CFR 122.29(b)(1)(i) and (ii)). A stand-alone facility is a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site (see 40 CFR 122.29(b)(1)(iii)). New facility does not include new units that are added to a facility for purposes of the same general industrial operation (for example, a new peaking unit at an electrical generating station).

Our interpretation is consistent with the January 11, 2002 EPA headquarters memorandum from Sheila Frace, Director of Engineering and Analysis Division, to Alexis Strauss, Director of Water Management Division. The North Anna site was originally designed to accommodate four units, but only two were eventually licensed for operation. Much of the infrastructure for the original design remains to support additional units, especially the intake and discharge tunnels. The ESP project is basically within the original footprint for purposes of the same general industrial operation. It is clearly not a greenfield or stand-alone project.

Application Revision

None.

VDEQ Comment F2(b)(ii)

2. Wetland Management and Water Resources (continued)

(b) Impingement and Entrainment (continued)

(ii) Limiting Impingement/Entrainment versus Limiting Consumption. The proposed once-through cooling proposed for Unit 3 will raise impingement and entrainment losses as compared with a cooling tower, but it would reduce consumptive use. A cooling tower would also keep thermal conditions in the Lake tolerable for aquatic life. DEQ's Office of Wetlands and Water Protection recommends that the Draft EIS include an alternative not considered in the Application to address this matter: such an alternative would consist of a single new reactor using a cooling tower with Lake Anna as its source.

Response

See response to VDEQ Comment F1(d).

Application Revision

None.

VDEQ Comment F2(c)

2. *Wetland Management and Water Resources (continued)*

(c) Water Quantity Issues. For the purpose of this discussion, DEQ's Office of Wetlands and Water Protection assumes that only one additional unit is proposed, because proposed Unit 4 has no identifiable water source.

The proposed addition of Unit 3 would increase the frequency and duration of drawdowns in the Lake. The Application indicates, in Table 2.4.6, that the amount of time that Lake Anna would drop two feet or more would increase from 5.6% of the time to 11.6% of the time. As DEQ's Office of Wetlands and Water Protection indicates, this would mean that flow in the North Anna River below the dam is 20 cfs for 11.6% of the time. Under pre-dam conditions (1929-1971), the streamflow in the River below the dam was 20 cfs only 4.2% of the time, as the Department of Game and Inland Fisheries also points out (see item 1(b), above). This flow rate equals 5.4% of the River's mean annual flow (MAF) at the dam. Under the Tennant rating system, a stream flow of between 0 and 10% of MAF is rated as "severe degradation." Unlike natural drought, which is temporary, the addition of another generating unit which increases the consumptive loss from the watershed would create nearly perennial conditions of severe degradation every fall. For this reason, DEQ's Office of Wetlands and Water Protection is requesting additional studies; see "Additional Analysis Needs," items 1 and 2, below.

The addition of a fourth unit would cause a net loss of 35 additional cfs, according to DEQ's Northern Virginia Regional Office. This would bring the operating level of the lake down to 242 feet MSL, which is 6 feet lower than the target level at which the lake contingency plan currently goes into effect.

Response

VDEQ's comment suggests that the increase in consumptive loss from the watershed due to the addition of Unit 3 would create nearly perennial conditions of severe degradation every fall, unlike natural droughts that are temporary. Results produced from the water balance model and presented in ER Figure 5.2-2 demonstrate that this is not the case. Table 1 summarizes the number of weeks in each calendar year during which the dam outflow was predicted to be 20 cfs for the simulated period of 1978-2003. Results are presented for the existing units by themselves and also with a Unit 3 added. Major droughts that have occurred during this period, as documented by the Virginia District of the U. S. Geological Survey, are identified in the remarks column of this table. The data included in this table indicate that drought flows (20 cfs) would not occur on a perennial basis with the addition of Unit 3. In fact, the minimum 20 cfs flow is predicted to occur in 10 years out of every 25-year (1978-2003) period simulated. Outflows are in excess of 20 cfs in the other 15 years. For comparative purposes, an outflow of 20 cfs is predicted to occur in 3 years out of the 25-year (1978-2003) period simulated for the existing units by themselves. Based on this information, perennial conditions of "severe degradation" would not occur every fall. See the response to VDEQ Comment AA1 for additional information.

Table 1. Weeks Per Year Dam Outflow Predicted to be 20 cfs for 1978-2003

Year	Number of Weeks per Year Outflow is 20 cfs		Remarks
	Existing Units	Existing Units + Unit 3	
1978	0	0	
1979	0	0	
1980	0	14	Drought[1]
1981	0	33	Drought[1]
1982	0	2	Drought[1]
1983	0	0	
1984	0	0	
1985	0	0	
1986	0	4	
1987	0	0	
1988	0	0	
1989	0	0	
1990	0	0	
1991	0	0	
1992	0	0	
1993	0	6	
1994	0	0	
1995	0	0	
1996	0	0	
1997	0	0	
1998	7	12	Drought[1]
1999	0	7	Drought[1]
2000	0	0	
2001	11	14	Drought[2]
2002	49	52	Drought[3]
2003	0	6	

[1] U. S. Geological Survey, Virginia District, Seasonal Streamflow Conditions and Historic Droughts in Virginia. Available at http://va.water.usgs.gov/GLOBAL/histcond.htm. Accessed May 26, 2004.
[2] U. S. Geological Survey, Virginia District, Drought Monitoring Task Force, Drought Status Report, December 7, 2001. Available at http://va.water.usgs.gov/drought/dsr_12-07-01.htm. Accessed May 26, 2004.
[3] U. S. Geological Survey, Virginia District, Drought Monitoring Task Force, Drought Status Report, June 7, 2002. Available at http://va.water.usgs.gov/drought/DMTF-Report-june2002.doc. Accessed May 26, 2004.

With respect to the comment regarding the additional consumptive water use of 35 cfs by Unit 4, Dominion has decided to use dry towers as a means of heat dissipation for this unit (Reference 1). Consumptive water use for Unit 4 is now estimated to be less than 2 cfs under normal operating conditions. With this change, water-related impacts associated with Unit 4 would be small. See the response to VDEQ Comment F1(b) for additional information.

References

1. March 31, 2004 Letter from Eugene S. Grecheck, Vice President-Nuclear Support Services, Dominion, to U. S. Nuclear Regulatory Commission, Document Control Desk, "Dominion Nuclear North Anna, LLC, North Anna Early Site Permit Application, Revised Approach for Unit 4 Normal Plant Cooling," NRC Accession Number ML040980485.

Application Revision

None.

VDEQ Comment F2(d)

2. Wetland Management and Water Resources (continued)

(d) Regulatory Authority under the Virginia Water Protection Permit Program. The Application and the request for concurrence with the consistency certification both fail to describe correctly the applicability of State laws and regulations pertaining to water withdrawals. Table 1.2.1 indicates that the Virginia Water Protection Permit regulation, 9 VAC 25-210, is only necessary for "discharge of dredge, fill, or pollutants into surface waters." In fact, since 2000, a wider range of activities in surface waters has been covered by this program, including water withdrawals in particular. Secondly, the attachment listing programs for coastal zone management consistency fails to make the connection, saying only that permits under *Virginia Code* section 62.1-44.15:5 are required to excavate in a wetland. These regulatory authorities should be clarified in the new submission of the federal consistency certification as well as in the license application and Draft EIS.

Response

It is understood that a Virginia Water Protection Permit would be required for construction of the intake to address water withdrawal issues as well as any wetland impacts. This clarification will be made in future submittals.

Application Revision

None.

VDEQ Comment F2(e)

2. Wetland Management and Water Resources (continued)

(e) Timing of NRC Action in relation to Virginia Water Protection Permit. DEQ's Office of Wetlands and Water Protection recommends that because of the lack of abundant water resources in the Lake Anna watershed and the possibility that a Virginia Water Protection Permit may not be issued, the Nuclear Regulatory Commission should consider one of the following:

- Do not issue the Early Site Permit until Dominion receives a Virginia Water Protection Permit; or
- Require that Dominion obtain a Virginia Water Protection Permit prior to conducting any work specified in the site redress plan associated with the Early Site Permit.

Response

Dominion does not support the option of deferring the ESP until a Virginia Water Protection Permit is obtained. Such a deferral is not necessary for the ESP process to be completed. As indicated in the withdrawn consistency certification, if a decision is made to proceed with new units, Dominion would obtain any required permits, including a Virginia Water Protection Permit. Further, Dominion commits that it would not conduct any pre-construction work related to the intake and cooling water systems prior to obtaining a Virginia Water Protection Permit and approvals required under sections 316(a) and (b) of the Clean Water Act.

Application Revision

None.

VDEQ Comment F3

3. Non-point Source Water Pollution Control. Utility companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of power lines (including essential supporting activities inside and outside the utility easement, such as sub-stations, staging areas, access roads, and borrow/spoil areas) must file general erosion and sediment control specifications annually with the Department of Conservation and Recreation's Division of Soil and Water Conservation for review and approval in accordance with the Virginia Erosion and Sediment Control Law (*Virginia Code* section 10.1-563.D.). All regulated activities must comply with the Erosion and Sediment Control specifications, irrespective of whether work is undertaken on company property or on an easement owned by another party (including VDOT right-of-way).

Construction of company buildings, facilities, and other structures are not regulated by section 10.1-563.D., and must therefore comply with the requirements of the appropriate local program. Dominion should contact Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401) to ensure compliance with applicable local requirements.

Erosion and Sediment Control specifications should include, at a minimum, a description of all measures and policies that will be implemented on the project site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details and symbols) must be provided that meet the requirements of the 19 Minimum Standards in the Virginia Erosion and Sediment Control Regulations (see 4 VAC 50-30-40) that apply. Practices in the most current edition of the *Virginia Erosion and Sediment Control Handbook* must serve as minimum design criteria. Variance requests (especially those for MS-16, Trench Length) must be submitted for approval on a project-specific basis to ensure that site characteristics (soils, topography, adjacent areas) are fully considered.

Specifications covering all planned regulated activities for a given calendar year must be approved by the Department of Conservation and Recreation's Division of Soil and Water Conservation prior to initiation of the project. Questions may be addressed to the Division's central office (Lee Hill, telephone (804) 786-3998).

Response

If Dominion decides to proceed with construction, Dominion will comply with the applicable requirements from the Virginia Erosion and Sediment Control Regulations that govern land-disturbing activities associated with the construction, installation and maintenance of power lines. However, it has not yet been determined whether additional power line construction will be needed.

If needed, required permits would be obtained prior to commencing such activities. Likewise, specifications that address the measures and policies to be implemented for any planned, regulated activities would be prepared in accordance with the then current version of the Virginia Erosion and Sediment Control Handbook. These specifications would be submitted in a timely manner in order that agency approval would be obtained prior to initiating those activities, and similarly on a calendar-year basis thereafter.

<u>Application Revision</u>

None.

VDEQ Comment F4

4. Point Source Water Pollution Control. As indicated above (item 2(b)(i)), the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. Whether the new unit would be treated as an existing intake or a new intake under the section 316(b) regulations is not yet clear. (See "Regulatory and Coordination Needs Summary," item 1, below.)

Response

See the response VDEQ comment F2(b)(i).

Application Revision

None.

VDEQ Comment F5(a)

5. Air Pollution Control

(a) Permitting Requirements. According to DEQ's Northern Virginia Regional Office, the project does not appear to require any air pollution control permits at this time. In light of the fact that the Application mentions concrete batch plants, however, we recommend that Dominion verify this "no permits required" conclusion with DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880) following completion of the design phase of the project.

Response

VDEQ regulates airborne emissions at the North Anna site. The number of new unit-related, non-radiological air emission sources at the site is not known at this time. Potential emission sources during plant operation may include auxiliary boilers, stand-by diesel generators, and cooling towers, as well as concrete batch plants during construction. If a decision were made to build new units, Dominion would confirm its project-specific air permitting requirements with the appropriate VDEQ Regional Office following completion of the design phase of the project, including confirmation of any requirements that apply specifically to concrete batch plants.

Application Revision

None.

VDEQ Comment F5(b)

5. Air Pollution Control (continued)

(b) Fugitive Dust Rules. The Application did not indicate a commitment to abide by fugitive emissions rules. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

Response

ER Section 4.4.1.2.2 identifies the fugitive dust rules as an applicable standard. Fugitive dust generated during earth-moving and material-handling activities may include emissions from haul roads, wind erosion of exposed surfaces and storage piles, and other activities in which the material is removed, stored, transported or redistributed.

Dominion is committed to complying with the applicable Commonwealth of Virginia fugitive emissions rules that govern the construction and operation phases of the new units. If Dominion decides to proceed with construction, specific mitigation measures to reasonably keep the generation of fugitive dust to a minimum would be identified in a dust control plan or similar document, prepared prior to initiating project construction activities.

Application Revision

None.

VDEQ Comment F5(c)

5. Air Pollution Control (continued)

(c) Open Burning Rules. If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact Louisa County officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;
- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

Response

If Dominion decides to proceed with construction and if open burning activities were considered necessary during construction of the new units, Dominion would contact Louisa County officials (or other cognizant agencies – for example, the Department of Forestry) to determine what local requirements, if any, exist.

Dominion is committed to meeting the requirements of the air quality regulations for open burning set forth by VDEQ and, if applicable, Louisa County, as well as any relevant regulations established by the Virginia Department of Forestry.

Application Revision

None.

VDEQ Comment AP1

Advisory Policies and Other Environmental Issues

1. Natural Heritage Resources. The Department of Conservation and Recreation has searched its Biotics Data System for occurrences of natural heritage resources in the project area. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plants and animals, unique or exemplary natural communities, significant geologic formations, and similar features of scientific interest. The Department of Conservation and Recreation (DCR) reports that natural heritage resources have not been documented in the project area.

The Department of Agriculture and Consumer Services (VDACS) has responsibility for state-listed endangered or threatened plant and insect species. VDACS indicates that the data bases maintained by the Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service, with whom Dominion consulted concerning endangered species, have incomplete records of state-protected plant and insect species. Recent changes in regulations implementing the Virginia Endangered Plant and Insect Species Act will necessitate further review of the project by VDACS or by DCR's Natural Heritage Division.

Under a memorandum of agreement between the Department of Conservation and Recreation and the Department of Agriculture and Consumer Services, DCR represents VDACS in commenting on potential impacts on state-listed threatened and endangered plant and insect species. According to DCR's records, the proposed project would not affect any documented state-listed plants or insects.

Response

Dominion understands that the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (VDCR) have the responsibility for maintaining state-listed species databases. Following consultation with state agencies, Dominion agrees with the VDCR's findings that impacts from work relevant to the ESP site project would not affect any documented state-listed plants or insects. In addition, previous findings from NRC's License Renewal GEIS Supplement 7 conclude that impacts on species around the North Anna site and associated transmission lines would be small.

Application Revision

None.

VDEQ Comment AP2

> *2. Recreation Impacts.* The increased water withdrawal needed for new generating units would be likely to reduce lake levels during the summer and fall due to increased power plant demand and evaporation. Most of the 43,000 anglers visiting this important recreational lake every year use the ramps at the State Park or those belonging to commercial operators to gain access to the Lake. Pleasure traffic greatly exceeds angler traffic, by as much as 10 to 15 times according to DGIF wardens. Increased drawdowns proposed to serve the new units would adversely affect lake access, and local economic conditions in the process. For example, during the 2002 drought, the reservoir pool dropped from 250 feet above mean sea level to 245.1 feet, and most boat ramps could not support launches. If the third generating unit had been added in that situation, the drawdown would have been an additional 2.5 feet, or 242.6 feet MSL. The Draft EIS should provide a full analysis of the impacts of the proposed units upon Lake recreation, along with an analysis of potential mitigation of such impacts. The analysis should include the time of year (presumably in the fall) that drawdowns occur (see "Additional Analysis Needs," item 3, below).
>
> The project may affect the views from across the Lake as well as from Route 76, the interstate bicycle route. Designs for development of the proposed site should include efforts to minimize these visual impacts, according to the Department of Conservation and Recreation.

Response

VDEQ's comment suggests that the increase in lake drawdown caused by the addition of Unit 3 would adversely affect lake access and local economic conditions in the process. VDEQ, citing results presented in ER Section 5.2.2.2, correctly notes that the drawdown would have been an additional 2.5 feet during the 2002 drought. (In terms of precipitation, water year 2002 was the driest year on record out of the 108-year period of record for the Virginia Division 2 climate region.) It is noted that an extended drought period (longer than 1 year) would be necessary to have the drawdown effect anticipated. Results produced from the water balance model and presented in ER Figure 5.2-3 show that the additional lake drawdown caused by adding Unit 3 is significantly less in non-drought years. This figure also shows that the minimum lake levels occur in the latter half of the calendar year, which is generally outside of peak recreational periods. Table 1 below summarizes the minimum lake elevation for the latter half of each year in the 1978-2002 period simulated along with the date on which the minimum lake elevation would have occurred. Data are provided for both pre-project (existing units by themselves) and post-project (existing units plus Unit 3) conditions. The last column in Table 1 represents the difference between post- and pre-project minimum lake elevations for each year.

Table 1. Minimum Lake Elevation for the Latter Half of Years 1978-2002

	Existing Units		Existing Units + Unit 3		Difference in Minimum Lake Elevation (ft)
Year[1]	Minimum Lake Elevation (ft MSL)	Date of Minimum Lake Elevation	Minimum Lake Elevation (ft MSL)	Date of Minimum Lake Elevation	
1978	248.44	11/5/78	248.22	11/5/78	-0.22
1979	250.08	7/29/79	249.96	7/29/79	-0.12
1980	248.47	10/26/80	247.74	10/26/80	-0.73
1981	248.03	10/11/81	246.37	10/11/81	-1.66
1982	249.49	10/10/82	249.02	11/14/82	-0.47
1983	248.62	10/2/83	248.01	10/9/83	-0.61
1984	249.89	9/16/84	249.68	9/23/84	-0.21
1985	249.68	8/4/85	249.35	8/4/85	-0.33
1986	248.75	10/12/86	247.96	10/12/86	-0.79
1987	249.01	8/23/87	248.51	8/23/87	-0.50
1988	248.95	10/23/88	248.36	10/23/88	-0.59
1989	249.98	8/27/89	249.89	8/27/89	-0.09
1990	249.71	9/30/90	249.27	9/30/90	-0.44
1991	248.87	11/10/91	248.19	11/10/91	-0.68
1992	249.67	10/18/92	249.26	10/18/92	-0.41
1993	248.37	11/14/93	247.64	11/14/93	-0.73
1994	249.96	10/2/94	249.84	7/3/94	-0.12
1995	249.34	9/17/95	249.02	9/17/95	-0.32
1996	250.06	9/22/96	250.03	9/22/96	-0.03
1997	249.35	10/5/97	248.66	10/5/97	-0.69
1998	247.83	11/22/98	247.08	12/20/98	-0.75
1999	248.37	8/15/99	247.73	8/22/99	-0.64
2000	249.51	11/12/00	248.78	11/26/00	-0.73
2001	247.33	12/30/01	246.36	12/30/01	-0.97
2002	245.07	10/13/02	242.61	10/13/02	-2.46

[1] Minimum lake elevations identified from July-December period of each year to ensure independence of events.

The Table 1 results indicate that annual minimum lake elevations under post-project conditions are 0.03 to 2.46 feet lower than for pre-project conditions, with this difference averaging 0.61 feet. The greatest difference occurs during drought years, such as those that occurred in 1981 (1.66 feet) and 2002 (2.46 feet). During non-drought years [see the response to VDEQ Comment F2(c) for identification of drought years], the differences in minimum lake elevations are significantly less. The Table 1 results further indicate that the minimum lake elevation occurs most frequently in October for the existing units by themselves (10 out of 25 years) and for the existing units plus Unit 3 (8 out of 25 years).

Note that with Dominion's decision to use dry cooling towers for Unit 4 [see the response to VDEQ Comment F1(b)], the impact to lake levels due to the addition of this unit would be small.

With respect to the recreational impact due to the additional drawdown from operation of Unit 3, the analysis of the effects in non-drought years shows that the overall impacts on the lake levels are relatively small, with the minimum lake levels typically being greater than, or slightly less than, the 248 foot level, mainly in the fall months. Throughout the summer months, the lake levels would be higher than these minimum levels. Although the recreational use of the lake would still be high in the early fall, the greatest use would be during the summer months. Therefore, the impacts on the recreational use of the lake due to decreases in lake level during these non-drought years would be small during the summer months when recreational use is at its peak. Furthermore, the information in Table 1 demonstrates that even with a new Unit 3 in operation, the lake level would have dropped to 245 ft msl (where the VDEQ indicates that most boat ramps could not support launches), only one year in the last 24 and that was during the record 2002 drought.

The potential for visual impacts is addressed in the ER Sections 5.8.1 and 5.8.2. It was concluded that the magnitude of any visual impacts would be specific to the design and layout of the power plant to be constructed, especially the selection of cooling systems. If a decision were made to proceed with new units, a detailed impact analysis using the selected reactor would be performed as part of detailed engineering and described in the COL application. Part of this impact analysis would be to develop mitigation measures to reduce the visual impacts, if needed.

<u>Application Revision</u>

See the response to VDEQ Comment AA1.

VDEQ Comment AP3

> 3. *VPDES Stormwater General Permit Applicability.* According to DEQ's Northern Virginia Regional Office, the disturbance of approximately 200 acres of land on the south side of Lake Anna for the proposed project will necessitate permit coverage under the Virginia Pollutant Discharge Elimination System (VPDES) permit for stormwater discharges associated with construction activity. Questions on fulfillment of this requirement may be addressed to DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880).

Response

If a decision is made to proceed with new units, necessary permits for stormwater discharges would be obtained prior to any construction-related activity associated with the project.

Application Revision

None.

VDEQ Comment AP4

4. Solid and Hazardous Waste Management. The Application addressed solid and hazardous waste issues, but did not include a search of waste-related databases, according to DEQ's Waste Division. The Waste Division did a cursory review of its data files and did not find any contamination sites that might affect or be affected by the proposed project.

Any soil that is suspected of contamination, or wastes that are generated, must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. These include, but are not limited to, the Virginia Waste Management Act (*Virginia Code* sections 10.1-1400 et seq.), the Virginia Hazardous Waste Management Regulations (9 VAC 20-60), and the Virginia Solid Waste Management Regulations (9 VAC 20-80). (For additional citations, see the enclosed DEQ memo, Modena to Irons, dated January 29, 2004).

The Application addressed pollution prevention. DEQ encourages Dominion to implement pollution prevention principles in all projects, including the reduction of waste materials at the source, re-use of materials, and recycling of waste materials.

Response

Dominion recognizes that any soil suspected of contamination or any waste generated will be disposed of in accordance with applicable federal, state, and local laws and regulations. If a decision is made to proceed with new units, pollution prevention principles would be implemented where appropriate and practicable.

Application Revision

None.

VDEQ Comment AP5

5. Alternatives Discussion. As mentioned above, the Draft EIS should demonstrate consideration and analysis of a single new unit with a cooling tower and Lake Anna as a water source (see "Federal Consistency...," items 1(e) and 2(b)(ii), above). Moreover, it should consider alternatives to the entire proposal as a means of ensuring that significant environmental impacts do not occur to the fishery resources in and downstream of Lake Anna (see "Federal Consistency...," item 1(e), above).

Response

See the response to VDEQ Comment F1(d).

Application Revision

None.

VDEQ Comment AP6

> 6. *Local and Regional Concerns.* The Thomas Jefferson Planning District Commission considered this review at its regular meeting on January 8, 2004. The Commission had no comment on the project.

Response

No response is required to this comment.

Application Revision

None.

VDEQ Comment AA1

Additional Analysis Needs

1. Downstream Flows. DEQ's Office of Wetlands and Water Protection recommends that a range of variability study be performed, comparing the pre- and post-project Index of Hydrologic Alterations for the North Anna River immediately below the dam. The methodology for conducting such a study may be found at:

http://www.conserveonline.org/2000/12/a/en/iha_meth.pdf

DEQ's Office of Wetlands and Water Protection is interested in whether and to what extent the pre- and post-project conditions are different for the 90-day minima, creating long-term low-flow stress conditions. The range of variability analysis may not show a significant change in pre- and post-project conditions. The minimum flow release (20 cfs) is above the extreme minimum flows experienced by the river in its natural pre-dam state in the 1930 drought and similar to low flows in the 1933 drought. However, the full range of the record needs to be examined.

In addition, DEQ's Office of Wetlands and Water Protection is interested in whether the Lake and reactors have significantly changed the Julian date of annual maxima which could affect spring spawning. It is possible that the watershed and wintertime stream flows are large enough that the Lake returns to a full condition each spring, and the Julian date of annual maxima is not changed by the power plants, but the simulation modeling and range of variability analysis should be done to confirm this.

Performance of these statistical studies does not require field work, so they could be initiated immediately, and the results reported in the Draft Environmental Impact Statement ("Draft EIS").

Response

As recommended by the VDEQ, Indicators of Hydrologic Alteration (IHA) have been calculated for the outflow from the North Anna Dam under both pre- and post-impact conditions, and the Range of Variability Approach (RVA) has been applied to assess hydrologic alteration. These analyses have been performed using the IHA software package (Reference 1), which calculates statistical descriptions of the streamflow record and changes in these statistics for 33 hydrologic parameters. These parameters are organized into 5 groups that are intended to characterize the following:

- Magnitude of monthly water conditions
- Magnitude and duration of annual extreme water conditions
- Timing of annual extreme water conditions
- Frequency and duration of high and low pulses
- Rate and frequency of water condition changes

Richter et al. (References 2-4) describe the methodology that is used by the IHA software package to perform the IHA and RVA analyses. The application of this methodology to the North Anna River and associated results are described below.

IHA were calculated for the Lake Anna weekly outflows as predicted by the water balance model described in ER Section 5.2.2.1. The period of record for this simulation includes water years 1979-2002 (24 years). Daily outflows, required as input to the IHA software package, were obtained through linear interpolation of the weekly time series. The pre-impact condition is defined to be Lake Anna in its current, impounded condition with the existing Units 1 and 2 using the lake for condenser cooling. The post-impact condition assumes the addition of Unit 3 with a once-through system for condenser cooling. Note that the post-impact condition does not consider Unit 4. With Dominion's decision to use dry cooling towers for Unit 4 [see the response to VDEQ Comment F1(b)], the impact to lake outflows due Unit 4 would be small.

Results of the statistical analyses are summarized in Tables 1, 2, and 3. Table 1 includes the 10%, 25%, 50%, 75% and 90% quantiles for each of the 33 hydrologic parameters for pre- and post-impact conditions. Table 2 summarizes the results of the IHA analysis, provides the medians and coefficients of dispersion for each hydrologic parameter in a "scorecard" format, and quantifies changes in the IHA between the pre-impact and post-impact water regimes. Table 3 provides the results of the RVA analysis. In each of these tables, the IHA statistics have been calculated non-parametrically as recommended in the IHA User's Manual (Reference 1). Note that post-impact period is assumed to extend from 2003-2026 for the purpose of comparing pre- and post-impact streamflow statistics. Also note that several IHA are associated with durations of less than 7 days (e.g., 1-day minimum flow). Because the daily outflows were obtained through linear interpolation of the weekly values, any of the IHA associated with durations of less than 7 days may not be representative.

With respect to the VDEQ's comments above regarding the 90-day minimum flow, the results in Tables 1 and 2 indicate that there is no change in the median 90-day minimum flow as a consequence of adding Unit 3. The results do indicate greater variability in the 90-day minimum flow with the addition of Unit 3. The VDEQ also expressed interest in any significant changes to the Julian date of annual maximum, which could affect spring spawning. Results included in Tables 1 and 2 demonstrate that the Julian date of the annual maximum does not change significantly with the addition of Unit 3. This would indicate that the spring spawning regime in the North Anna River below the North Anna Dam would not be impacted by the operation of a new Unit 3 on Lake Anna.

References

1. Indicators of Hydrologic Alteration, User's Manual, The Nature Conservancy with Smythe Scientific Software, July 2001.

2. Richter, B.D., J.V. Baumgartner, J. Powell, and D.P. Braun. A method for assessing hydrologic alteration within ecosystems. *Conservation Biology* 10:1163-1174, 1996.

3. Richter, B.D, J.V. Baumgartner, R. Wigington, and D.P. Braun. How much water does a river need? *Freshwater Biology* 37:231-249, 1997

4. Richter, B.D., J.V. Baumgartner, D.P. Braun, and J. Powell, A Spatial Assessment of Hydrologic Alteration Within a River Network. *Regul. Rivers: Res. Mgmt.* 14:329-340, 1998.

Application Revision

ER Section 5.2.2.2 will be revised to read as follows:

5.2.2.2 Analysis and Evaluations of Impacts on Water Use

The results described in Section 5.2.2.1 indicate there would be water-use impacts associated with the operation of Unit 3. These impacts include reductions in the volume of water available for release from the North Anna Dam, which would decrease the volume of water available for downstream users. Impacts also include increases in lake drawdown during the summer months, which could impact other lake users. These impacts are analyzed and evaluated below.

Results included in Figure 5.2-2 and Table 5.2-3 quantify the impact of the releases from the North Anna Dam that would occur with the addition of Unit 3. Given that the minimum releases would comply with the existing VPDES permit Lake Level Contingency Plan (Reference 2), there would be no impact on downstream water users in terms of the minimum flow rate in the North Anna River. The duration of the minimum flow release rates would increase with the addition of Unit 3, however. For the existing units, the duration for which the minimum release is less than or equal to 40 cfs would be 43.9 percent of the time; and the duration for which the minimum release is 20 cfs would be 5.3 percent of the time. Comparable durations with the addition of Unit 3 are 52.4

percent of the time for flows less than or equal to 40 cfs, and 11.8 percent of the time for a flow of 20 cfs. Potential impacts would be greatest in the reach of the North Anna River extending from below the North Anna Dam to its confluence with the South Anna River.

To better quantify impacts to instream flows in the North Anna River, Indicators of Hydrologic Alteration (IHA) have been calculated for the outflow from the North Anna Dam under both pre- and post-impact conditions, and the Range of Variability Approach (RVA) has been applied to assess hydrologic alteration. These analyses have been performed using the methodology proposed by Richter et al. (References 4-6), which calculates statistical descriptions of the streamflow record and changes in these statistics for 33 hydrologic parameters. These parameters are organized into 5 groups that are intended to characterize the following:

- Magnitude of monthly water conditions
- Magnitude and duration of annual extreme water conditions
- Timing of annual extreme water conditions
- Frequency and duration of high and low pulses
- Rate and frequency of water condition changes

The IHA software package (Reference 7) has been used to perform the IHA and RVA analyses. The application of this methodology to the North Anna River and associated results are described below.

IHA were calculated for the Lake Anna weekly outflows as predicted by the water balance model described in ER Section 5.2.2.1. The period of record for this simulation includes water years 1979-2002 (24 years). Daily outflows, required as input to the IHA software package, were obtained through linear interpolation of the weekly time series. The pre-impact condition is defined to be Lake Anna in its current, impounded condition with the existing Units 1 and 2 utilizing the lake for condenser cooling. The post-impact condition assumes the addition of Unit 3 with a once-through system for condenser cooling, and the addition of Unit 4 with a closed-cycle, dry tower system for condenser cooling. Note that the heat dissipation system selected for Unit 4 will have no to negligible impacts to lake levels or outflows.

Results of the statistical analyses are summarized in Tables 5.2-5, 5.2-6, and 5.2-7. Table 5.2-5 includes the 10%, 25%, 50%, 75% and 90% quantiles for each of the 33 hydrologic parameters for pre- and post-impact conditions. Table 5.2-6 summarizes the results of the IHA analysis, provides the medians and coefficients of dispersion for each hydrologic parameter in a "scorecard" format, and quantifies changes in the IHA between the pre-impact and post-impact water regimes. Table 5.2-7 provides the results of the RVA analysis. In each of these tables, the IHA statistics have been calculated non-parametrically as recommended in the IHA User's Manual (Reference 7). Note that post-impact period is assumed to extend from 2003-2026 for the purpose of comparing pre- and post-impact streamflow statistics. Also note that several IHA are associated with durations of less than 7 days (e.g., 1-day minimum flow). Because the daily outflows were obtained through linear interpolation of the weekly values, any of the IHA associated with durations of less than 7 days may not be representative.

The results in Tables 5.2-5, 5.2-6, and 5.2-7 indicate that there are no changes in the median 7-day, 30-day and 90-day minimum flows as a consequence of adding Unit 3. The results do indicate greater variability in the minimum flows with the addition of Unit 3. Results included in Tables 5.2-5, 5.2-6, and 5.2-7 also demonstrate that the Julian date of the annual maximum does not change significantly with the addition of Unit 3. This would indicate that the spring spawning regime in the North Anna River below the North Anna Dam would not be impacted by the operation of a new Unit 3 on Lake Anna.

Results presented in Figure 5.2-3 and Table 5.2-4 quantify the impact on lake levels that would occur with the addition of Unit 3. Figure 5.2-3 indicates that the maximum annual drawdown in most years would not differ greatly from the current operation of the existing units. This figure also shows that the minimum lake levels occur in the latter half of the calendar year. To further quantify the impact on lake levels associated with the addition of Unit 3, the minimum lake elevation for the latter half of each year in the 1978-2002 period simulated along with the date on which the minimum lake elevation would have occurred have been summarized in Table 5.2-8. Data are provided for both pre-impact (existing units by themselves) and post-impact (existing units plus Unit 3) conditions. The last column in Table 5.2-8 represents the difference between post- and pre-impact minimum lake elevations for each year.

The Table 5.2-8 results indicate that annual minimum lake elevations under post-impact conditions are 0.03 to 2.46 feet lower than for pre-impact conditions, with this difference averaging 0.61 feet. The greatest difference occurs during drought years, such as those that occurred in 1981 (1.66 feet) and 2002 (2.46 feet). During non-drought years, the differences in minimum lake elevations are significantly less. The Table 5.2-8 results further indicate that the minimum lake elevation occurs most frequently in October for the existing units by themselves (10 out of 25 years) and for the existing units plus Unit 3 (8 out of 25 years). With respect to the recreational impact due to the additional drawdown from operation of Unit 3, the analysis of the effects in non-drought years shows that the overall impacts on the lake levels are relatively small, with the minimum lake levels typically being greater than, or slightly less than, the 248 foot level, mainly in the fall months. Throughout the summer months, the lake levels would be higher than these minimum levels. Although the recreational use of the lake would still be high in the early fall, the greatest use would be during the summer months. Therefore, the impacts on the recreational use of the lake due to decreases in lake level during these non-drought years would be small.

Lake drawdown to Elevation 244 ft msl and below would impact the existing units. The Technical Requirements Manual for the existing units currently requires plant shutdown when the lake level drops below Elevation 244 ft msl. Results included in Table 5.2-4 indicate that lake levels would fall to or below Elevation 244 ft msl 1.1 percent of the time when Unit 3 is added. Dominion would work with Virginia Power to change the minimum operating level of the existing units to 242 ft msl.

No other water-use impacts on surface water or groundwater users due to the normal operation of a new unit or units at the ESP site are anticipated other than those described above.

The following new tables will be added to ER Section 5.2.2.2:

- Table 5.2-5 (Table 1 in this response)
- Table 5.2-6 (Table 2 in this response)
- Table 5.2-7 (Table 3 in this response)
- Table 5.2-8 (Table 1 in response to DEQ Comment AP2)

The following new references will be added to Section 5.2 References:

4. Richter, B.D., J.V. Baumgartner, J. Powell, and D.P. Braun. A method for assessing hydrologic alteration within ecosystems. *Conservation Biology* 10:1163-1174, 1996.

5. Richter, B.D, J.V. Baumgartner, R. Wigington, and D.P. Braun. How much water does a river need? *Freshwater Biology* 37:231-249, 1997

6. Richter, B.D., J.V. Baumgartner, D.P. Braun, and J. Powell, A Spatial Assessment of Hydrologic Alteration Within a River Network. *Regul. Rivers: Res. Mgmt.* 14:329-340, 1998.

7. Indicators of Hydrologic Alteration, User's Manual, The Nature Conservancy with Smythe Scientific Software, July 2001.

Table 1. IHA Percentile Data North Anna River

	Pre-Impact Period: 1979-2002 (24 years)						Post-Impact Period: 2003-2026 (24 years)					
	10%	25%	50%	75%	90%	(75-25)/50	10%	25%	50%	75%	90%	(75-25)/50
Parameter Group #1												
October	40.00	40.00	40.00	120.20	365.40	2.00	20.00	28.39	40.00	44.51	318.69	.40
November	31.33	40.00	126.36	369.14	520.52	2.60	20.00	40.00	57.84	334.97	425.66	5.10
December	32.58	46.97	225.08	396.67	635.22	1.55	20.00	40.00	167.17	376.99	606.46	2.02
January	40.00	122.51	388.23	578.91	802.92	1.18	26.77	40.00	369.04	557.28	764.30	1.40
February	42.59	220.21	375.13	707.84	1423.49	1.30	40.00	100.21	351.33	686.30	1403.55	1.67
March	108.30	277.94	523.58	740.93	1247.35	.88	95.11	245.01	475.92	716.40	1222.78	.99
April	54.76	165.76	396.46	471.49	1115.81	.77	47.67	143.24	367.48	442.91	1088.27	.82
May	40.00	91.01	161.05	371.43	665.01	1.74	40.00	67.73	140.89	340.48	634.49	1.94
June	40.00	42.69	100.89	150.76	385.22	1.07	33.33	40.00	78.57	129.09	354.54	1.13
July	40.00	40.00	46.52	85.88	315.73	.99	29.03	40.00	40.00	50.25	277.74	.26
August	40.00	40.00	40.20	107.07	312.76	1.67	20.14	40.00	40.00	66.10	281.30	.65
September	40.00	40.00	40.00	40.90	370.44	.02	28.00	39.79	40.00	40.00	332.57	.01
Parameter Group #2												
1-day minimum	30.00	40.00	40.00	40.00	40.00	.00	20.00	20.00	40.00	40.00	40.00	.50
3-day minimum	30.00	40.00	40.00	40.00	40.00	.00	20.00	20.00	40.00	40.00	40.00	.50
7-day minimum	30.00	40.00	40.00	40.00	40.00	.00	20.00	20.00	40.00	40.00	40.00	.50
30-day minimum	26.00	40.00	40.00	40.00	40.00	.00	20.00	20.00	40.00	40.00	40.00	.50
90-day minimum	26.56	40.00	40.00	49.29	94.14	.23	20.00	20.44	40.00	40.00	73.40	.49
1-day maximum	268.11	1070.27	1618.86	2831.02	3871.94	1.09	242.98	908.40	1587.92	2798.42	3851.00	1.19
3-day maximum	261.40	1027.20	1595.72	2521.88	3603.93	.94	226.33	888.22	1564.91	2489.27	3582.93	1.02
7-day maximum	250.39	965.61	1560.21	2044.34	3227.55	.69	200.62	856.29	1529.32	2013.57	3206.42	.76
30-day maximum	200.97	601.78	871.71	1314.51	1630.08	.82	147.52	564.94	844.63	1287.24	1608.98	.86
90-day maximum	119.47	411.83	597.16	796.76	1162.81	.64	80.12	355.63	567.63	769.90	1139.01	.73
Number of zero days	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Base flow	.08	.10	.15	.25	.65	.98	.07	.10	.15	.24	.60	.94
Parameter Group #3												
Date of minimum	168.00	275.00	275.00	275.00	288.00	.00	273.00	275.00	275.00	275.00	281.50	.00
Date of maximum	338.50	37.50	85.00	169.75	275.00	.36	338.50	32.50	83.00	143.00	263.50	.30

Table 1. IHA Percentile Data North Anna River

	Pre-Impact Period: 1979-2002 (24 years)						Post-Impact Period: 2003-2026 (24 years)					
	10%	25%	50%	75%	90%	(75-25)/50	10%	25%	50%	75%	90%	(75-25)/50
Parameter Group #4												
Low pulse count	.00	.00	.00	.00	.50	.00	.00	.00	.00	1.00	2.00	.00
Low pulse duration	.00	.00	.00	.00	27.50	.00	.00	.00	.00	5.75	65.00	.00
High pulse count	.50	3.00	4.00	6.75	7.50	.94	.50	3.00	4.00	6.00	7.00	.75
High pulse duration	4.67	14.25	17.64	27.74	40.38	.76	1.67	12.81	15.67	21.28	32.71	.54
Parameter Group #5												
Rise rate	13.29	25.42	35.30	52.71	64.81	.77	10.11	25.58	35.20	49.43	73.89	.68
Fall rate	-63.38	-48.80	-34.84	-21.28	-8.74	-.79	-66.06	-50.28	-38.26	-24.16	-8.37	-.68
Number of reversals	2.50	13.50	19.00	21.75	24.50	.43	2.00	11.00	15.00	19.75	22.00	.58

Table 2. Non-Parametric IHA Scorecard, North Anna River

	Pre-impact period: 1979-2002 (24 years)	Post-impact period: 2003-2026 (24 years)
Watershed area	343.00	
Mean annual flow	264.85	240.43
Mean flow/area	.77	.70
Annual C. V.	.90	1.05
Flow predictability	.45	.43
Constancy/predictability	.71	.70
% of floods in 60d period	.31	.31
Flood-free season	2.00	5.00

	MEDIANS		COEFF. of DISP.		DEVIATION FACTOR		SIGNIFICANCE COUNT	
	Pre	Post	Pre	Post	Medians	C.V.	Medians	C.V.
Parameter Group #1								
October	40.0	40.0	2.00	.40	.00	.80	.04	.83
November	126.4	57.8	2.60	5.10	.54	.96	.81	.33
December	225.1	167.2	1.55	2.02	.26	.30	.64	.43
January	388.2	369.0	1.18	1.40	.05	.19	.68	.53
February	375.1	351.3	1.30	1.67	.06	.28	.73	.49
March	523.6	475.9	.88	.99	.09	.12	.81	.86
April	396.5	367.5	.77	.82	.07	.06	.71	.91
May	161.0	140.9	1.74	1.94	.13	.11	.77	.71
June	100.9	78.6	1.07	1.13	.22	.06	.52	.93
July	46.5	40.0	.99	.26	.14	.74	.14	.71
August	40.2	40.0	1.67	.65	.01	.61	.15	.74
September	40.0	40.0	.02	.01	.00	.76	.00	.64
Parameter Group #2								
1-day minimum	40.0	40.0	.00	.50	.00	999999.00	.00	.00
3-day minimum	40.0	40.0	.00	.50	.00	999999.00	.00	.00
7-day minimum	40.0	40.0	.00	.50	.00	999999.00	.00	.00
30-day minimum	40.0	40.0	.00	.50	.00	999999.00	.00	.00
90-day minimum	40.0	40.0	.23	.49	.00	1.10	.01	.22
1-day maximum	1618.9	1587.9	1.09	1.19	.02	.09	.94	.79
3-day maximum	1595.7	1564.9	.94	1.02	.02	.09	.93	.81
7-day maximum	1560.2	1529.3	.69	.76	.02	.09	.85	.82

Table 2. Non-Parametric IHA Scorecard, North Anna River

	MEDIANS		COEFF. of DISP.		DEVIATION FACTOR		SIGNIFICANCE COUNT	
	Pre	Post	Pre	Post	Medians	C.V.	Medians	C.V.
30-day maximum	871.7	844.6	.82	.86	.03	.05	.81	.90
90-day maximum	597.2	567.6	.64	.73	.05	.13	.63	.78
Number of zero days	.0	.0	.00	.00	999999.00	999999.00	.00	.00
Base flow	.2	.2	.98	.94	.01	.04	1.00	.93
Parameter Group #3								
Date of minimum	275.0	275.0	.00	.00	.00	999999.00	.00	.00
Date of maximum	85.0	83.0	.36	.30	.01	.16	.73	.75
Parameter Group #4								
Low pulse count	.0	.0	.00	.00	999999.00	999999.00	.00	.00
Low pulse duration	.0	.0	.00	.00	999999.00	999999.00	.00	.00
High pulse count	4.0	4.0	.94	.75	.00	.20	.51	.58
High pulse duration	17.6	15.7	.76	.54	.11	.29	.38	.76
The low pulse threshold is 40.00								
The high pulse level is 349.79								
Parameter Group #5								
Rise rate	35.3	35.2	.77	.68	.00	.12	1.00	.81
Fall rate	-34.8	-38.3	-.79	-.68	.10	.14	.71	.66
Number of reversals	19.0	15.0	.43	.58	.21	.34	.33	.51

Table 3. IHA Non-Parametric RVA Scorecard, North Anna River

	Pre-impact period: 1979-2002				Post-impact period: 2003-2026				RVA Categories		Hydrologic Alteration (Middle Category)
	Medians	Coeff. of Variance	Range Limits Low	Range Limits High	Medians	Coeff. of Variance	Range Limits Low	Range Limits High	Low	High	
Parameter Group #1											
October	40.0	2.00	31.0	660.4	40.0	.40	20.0	632.5	40.00	47.15	-.13
November	126.4	2.60	20.0	1033.8	57.8	5.10	20.0	1007.6	40.00	336.96	-.07
December	225.1	1.55	20.0	957.0	167.2	2.02	20.0	935.6	75.99	349.75	-.13
January	388.2	1.18	20.0	1810.5	369.0	1.40	20.0	1788.5	180.14	545.41	.13
February	375.1	1.30	20.0	2662.4	351.3	1.67	20.0	2639.9	260.35	567.10	.00
March	523.6	.88	20.0	1514.2	475.9	.99	20.0	1489.0	363.63	657.29	.00
April	396.5	.77	20.0	1306.9	367.5	.82	20.0	1278.9	192.40	434.02	-.13
May	161.0	1.74	20.0	852.7	140.9	1.94	20.0	819.3	124.71	296.15	-.25
June	100.9	1.07	20.0	879.2	78.6	1.13	20.0	846.3	50.82	139.25	.13
July	46.5	.99	20.0	556.7	40.0	.26	20.0	510.1	40.00	64.83	.07
August	40.2	1.67	20.0	397.2	40.0	.65	20.0	385.7	40.00	68.42	.00
September	40.0	.02	20.3	833.1	40.0	.01	20.0	799.2	40.00	40.00	-.24
Parameter Group #2											
1-day minimum	40.0	.00	20.0	40.0	40.0	.50	20.0	40.0	40.00	40.00	-.32
3-day minimum	40.0	.00	20.0	40.0	40.0	.50	20.0	40.0	40.00	40.00	-.32
7-day minimum	40.0	.00	20.0	40.0	40.0	.50	20.0	40.0	40.00	40.00	-.41
30-day minimum	40.0	.00	20.0	181.2	40.0	.50	20.0	103.5	40.00	40.00	-.40
90-day minimum	40.0	.23	20.0	269.9	40.0	.49	20.0	238.0	40.00	41.87	-.17
1-day maximum	1618.9	1.09	40.0	4712.9	1587.9	1.19	20.0	4688.7	1271.88	2327.47	.00
3-day maximum	1595.7	.94	40.0	4655.8	1564.9	1.02	20.0	4631.4	1230.87	2198.12	.00
7-day maximum	1560.2	.69	40.0	4549.0	1529.3	.76	20.0	4524.4	1132.03	1914.16	.13
30-day maximum	871.7	.82	39.7	3426.3	844.6	.86	20.0	3403.3	655.70	1179.77	.00
90-day maximum	597.2	.64	40.0	1939.3	567.6	.73	20.0	1914.0	447.35	678.70	.00
Number of zero days	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Base flow	.15	.98	.07	1.00	.15	.94	.04	1.00	.12	.20	-.13

Table 3. IHA Non-Parametric RVA Scorecard, North Anna River

	Pre-impact period: 1979-2002				Post-impact period: 2003-2026				RVA Categories		Hydrologic Alteration (Middle Category)
	Medians Coeff. of Variance		Range Limits Low	Range Limits High	Medians Coeff. of Variance		Range Limits Low	Range Limits High	Low	High	
Parameter Group #3											
Date of minimum	275.0	.00	153.0	313.0	275.0	.00	153.0	285.0	275.00	275.00	-.06
Date of maximum	85.0	.36	13.0	343.0	83.0	.30	13.0	343.0	80.50	217.50	.38
Parameter Group #4											
Low Pulse Count	.0	.00	.0	1.0	.0	.00	.0	2.0	.00	.00	-.32
Low Pulse Duration	.0	.00	.0	351.0	.0	.00	.0	107.0	.00	.00	-.23
High Pulse Count	4.0	.94	.0	10.0	4.0	.75	.0	8.0	3.00	5.75	.09
High Pulse Duration	17.6	.76	.0	46.0	15.7	.54	.0	39.0	15.00	20.04	-.30
The low pulse threshold is 40.00											
The high pulse level is 349.79											
Parameter Group #5											
Rise rate	35.3	.77	.0	94.9	35.2	.68	.0	96.3	29.86	42.13	-.25
Fall rate	-34.8	-.79	-72.8	.0	-38.3	-.68	-77.8	.0	-47.35	-22.93	.63
Number of reversals	19.0	.43	.0	27.0	15.0	.58	.0	24.0	15.00	20.75	-.20

Table 3. IHA Non-Parametric RVA Scorecard, North Anna River

Assessment of Hydrologic Alteration

	Middle RVA Category			High RVA Category			Low RVA Category		
	Expected	Observed	Alter.	Expected	Observed	Alter.	Expected	Observed	Alter.
Parameter Group #1									
October	15.00	13.00	-.13	8.00	5.00	-.38	1.00	6.00	5.00
November	14.00	13.00	-.07	8.00	6.00	-.25	2.00	5.00	1.50
December	8.00	7.00	-.13	8.00	7.00	-.13	8.00	10.00	.25
January	8.00	9.00	.13	8.00	6.00	-.25	8.00	9.00	.13
February	8.00	8.00	.00	8.00	7.00	-.13	8.00	9.00	.13
March	8.00	8.00	.00	8.00	6.00	-.25	8.00	10.00	.25
April	8.00	7.00	-.13	8.00	7.00	-.13	8.00	10.00	.25
May	8.00	6.00	-.25	8.00	7.00	-.13	8.00	11.00	.38
June	8.00	9.00	.13	8.00	5.00	-.38	8.00	10.00	.25
July	15.00	16.00	.07	8.00	5.00	-.38	1.00	3.00	2.00
August	15.00	15.00	.00	8.00	6.00	-.25	1.00	3.00	2.00
September	17.00	13.00	-.24	6.00	5.00	-.17	1.00	6.00	5.00
Parameter Group #2									
1-day minimum	22.00	15.00	-.32	.00	.00	.00	2.00	9.00	3.50
3-day minimum	22.00	15.00	-.32	.00	.00	.00	2.00	9.00	3.50
7-day minimum	22.00	13.00	-.41	.00	.00	.00	2.00	11.00	4.50
30-day minimum	20.00	12.00	-.40	1.00	1.00	.00	3.00	11.00	2.67
90-day minimum	12.00	10.00	-.17	8.00	5.00	-.38	4.00	9.00	1.25
1-day maximum	8.00	8.00	.00	8.00	8.00	.00	8.00	8.00	.00
3-day maximum	8.00	8.00	.00	8.00	7.00	-.13	8.00	9.00	.13
7-day maximum	8.00	9.00	.13	8.00	7.00	-.13	8.00	8.00	.00
30-day maximum	8.00	8.00	.00	8.00	7.00	-.13	8.00	9.00	.13
90-day maximum	8.00	8.00	.00	8.00	7.00	-.13	8.00	9.00	.13
Number of zero days	24.00	24.00	.00	.00	.00	.00	.00	.00	.00
Base flow	8.00	7.00	-.13	8.00	7.00	-.13	8.00	10.00	.25

Table 3. IHA Non-Parametric RVA Scorecard, North Anna River

Assessment of Hydrologic Alteration

	Middle RVA Category			High RVA Category			Low RVA Category		
	Expected	Observed	Alter.	Expected	Observed	Alter.	Expected	Observed	Alter.
Parameter Group #3									
Date of minimum	17.00	16.00	-.06	4.00	4.00	.00	3.00	4.00	.33
Date of maximum	8.00	11.00	.38	8.00	6.00	-.25	8.00	7.00	-.13
Parameter Group #4									
Low Pulse Count	22.00	15.00	-.32	2.00	9.00	3.50	.00	.00	.00
Low Pulse Duration	22.00	17.00	-.23	2.00	7.00	2.50	.00	.00	.00
High Pulse Count	11.00	12.00	.09	8.00	7.00	-.13	5.00	5.00	.00
High Pulse Duration	10.00	7.00	-.30	8.00	8.00	.00	6.00	9.00	.50
Parameter Group #5									
Rise rate	8.00	6.00	-.25	8.00	9.00	.13	8.00	9.00	.13
Fall rate	8.00	13.00	.63	8.00	4.00	-.50	8.00	7.00	-.13
Number of reversals	10.00	8.00	-.20	8.00	5.00	-.38	6.00	11.00	.83

VDEQ Comment AA2

> *2. In-stream Studies: Usable Habitat as a Function of Flow.* DEQ's Office of Wetlands and Water Protection may also recommend further in-stream studies as a supplement to the Draft EIS or as pre-requisite to any permit issuance, depending on confirmation of the concerns expressed above regarding near-perennial low-flow conditions (see "Federal Consistency...," item 2(c), above). This work should characterize weighted usable habitat as a function of flow for the indigenous fishery species in the North Anna River.
>
> DEQ's Office of Wetlands and Water Protection requests the daily output of the simulation models used by Dominion, if it is available in Excel worksheet format, to predict the frequency and duration of the lake drawdown, inflows, evaporation losses, and outflows that were used to develop Tables 5.2.3 and 5.2.4 in the Application.
>
> A statistical analysis of the indicators of hydrologic alteration should be performed, and the results presented in the Draft EIS, according to DEQ's Office of Wetlands and Water Protection.

Response

Bechtel Calculation No. 24830-G-018 (submitted to the NRC in Reference 1) includes the water balance model that was used to assess impacts on lake levels and outflows, which are reported in ER Section 5.2.2. The water balance model was developed using Excel spreadsheets. These spreadsheets are included with the calculation in electronic format. As noted in ER Section 5.2.2.1.3, the water balance modeling was conducted on a weekly basis. The inflows, evaporation losses, outflows, and lake levels used in the model represent weekly (7-day) averages. Daily output is not available.

With respect to the VDEQ's recommendation to conduct a statistical analysis of the indicators of hydrologic alteration, this analysis has been completed and is described in the response to VDEQ Comment AA1.

References

1. March 19, 2004 Letter from Eugene S. Grecheck, Vice President, Nuclear Support Services, Dominion, to U. S. Nuclear Regulatory Commission, Document Control Desk, "North Anna Early Site Permit Application, Lake Anna Modeling Calculations", NRC Accession Number ML040910433.

Application Revision

None.

VDEQ Comment AA3

> *3. Impact on Recreational Uses of Lake Anna.* The Application does not thoroughly address the water-based recreational uses of Lake Anna. While Table 5.2.4 demonstrates the frequency with which the Lake will fall below certain levels (see "Federal Consistency...," item 2(c) and "Advisory Policies...," item 2, above), we do not know the time of year this occurs and what impact it has on lake recreation. This information should be developed for the Draft EIS for the proposed project.

Response

See the response to VDEQ Comment AP2.

Application Revision

None.

VDEQ Comment AA4

> *4. Submerged Intake Structure.* The Department of Game and Inland Fisheries (DGIF) recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations (see "Federal Consistency...,"item 1(a), above). Results of this analysis should be provided in the Draft EIS for this project.

Response

If a decision is made to proceed with new units, Dominion would evaluate the use of a submerged intake as a temperature mitigation option as described in ER Section 9.4.1.1.3. ER Section 5.3.1.2.5 indicates that a submerged intake, consisting of a solid skimmer wall or a flexible floating curtain in the North Anna Reservoir, could reduce impingement and entrainment rates.

The design of the intake structure would be reviewed by VDEQ in support of a 316(b) determination, which Dominion would seek if it decides to proceed with new units.

Application Revision

None.

VDEQ Comment AA5

> *5. Federal Consistency Certification.* Dominion's re-submission of the federal consistency certification may be accomplished separately or, as we would recommend, in conjunction with either the Draft or the Final EIS for this project but would, in any case, be subject to the requirements applicable to consistency certifications for federally licensed projects. These appear in the Federal Consistency Regulations at Title 15, Code of Federal Regulations, Part 930, sub-part D ("Consistency for Activities Requiring a Federal License or Permit," sections 930.50 through 930.66). The new consistency certification should reflect not only further development of the project proposal, but also appropriate additional analysis as detailed in this letter. Questions on consistency may be addressed to this Office (Charles Ellis, telephone 698-4488).

Response

Dominion recognizes the need for consultation with the VDEQ and compliance with its Coastal Resources Management Program, in accordance with 15CFR930. Dominion will resubmit the Federal Consistency Certification for the North Anna ESP site during the time period in which the Draft Environmental Impact Statement (EIS) is published and available for review and comment. This consistency submittal will reflect appropriate analyses conducted and conclusions reached to address the relevant coastal zone issues.

Application Revision

None.

VDEQ Comment AA6

> *6. Draft Environmental Impact Statement.* Although not required to satisfy the Federal Consistency Regulations, for administrative purposes we recommend that the federal consistency certification be submitted at the same time as the Draft EIS. This would allow for concurrent reviews of the two documents, and the information and analysis in the Draft EIS can support the analysis of the consistency certification. If you have questions about the interplay of the Draft EIS and the consistency certification requirement, please feel free to contact me at telephone 698-4325.

Response

See the response to VDEQ Comment AA5.

Application Revision

None.

VDEQ Comment RC1

Regulatory and Coordination Needs Summary

1. Water Resources Permitting. As indicated previously, the proposed addition of either one or both of the proposed new generating units at the North Anna Power Station will require Virginia Water Protection Permits and, to the extent the land disturbance exceeds one acre, VPDES Stormwater General Permit coverage for construction activities. For water withdrawals requiring Virginia Water Protection Permits, Dominion must apply to DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone 698-4072). Results of the studies requested or recommended in regard to water resources (see "Additional Analysis Needs," items 1 and 2, above) should be submitted to that Office at 629 East Main Street, 9th floor, Richmond, Virginia 23219, Attn: Joseph P. Hassell. Copies of these study results should be submitted to the Department of Game and Inland Fisheries, attn: Gary Martel (Director, Fisheries Division), 4010 West Broad Street, Richmond, Virginia 23230.

For land disturbance involving one acre or more, Dominion should apply to DEQ's Northern Virginia Regional Office (John Bowden, Deputy Regional Director, telephone (703) 583-3880) for coverage under the VPDES Stormwater General Permit for construction activities. Similarly, the issue of impingement and entrainment effects is to be addressed under new regulations implementing section 316(b) of the Clean Water Act; advice on this matter may be obtained from the same Office or from DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone (804) 698-4072).

Response

No response is needed for this comment.

Application Revision

None.

VDEQ Comment RC2

> *2. Air Permitting.* Questions relating to air quality rules and air permitting, for activities ranging from open burning to operation of concrete batch plants or other fuel-burning equipment, should be addressed to DEQ's Northern Virginia Regional Office (Mr. Terry Darton, Air Permits Manager, telephone (703) 583-3845).

Response

No response is needed for this comment.

Application Revision

None.

VDEQ Comment RC3

> *3. Erosion and Sediment Control; Stormwater Management.* Questions relating to the fulfillment of the Erosion and Sediment Control Plan and Stormwater Management Plan requirements should be addressed to the Department of Conservation and Recreation's Soil and Water Conservation Division (Lee Hill, telephone 786-3998). Questions on fulfillment of local erosion control requirements should be addressed to Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401).

Response

No response is needed for this comment.

Application Revision

None.

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L. Cuoco
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CONCURRENCE

C. L. Funderburk	ZZZ 6-28-04
D. A. Sommers	[signature] 6-24-04
P. F. Faggert	PFaggert
M. L. Smith	M L Smith
L. Cuoco/D. Lewis	[signature] for D Lewis/L Cuoco

VERIFICATION OF ACCURACY

REVIEW AND EXPERTISE FROM DOMINION ELECTRIC ENVIRONMENTAL SERVICES.

ACTION PLAN/COMMITMENTS (STATED OR IMPLIED):

1. Revise the North Anna ESP application consistent with the RAI responses in this and other letters by **August 31, 2004** (this is an existing action item).

REQUIRED CHANGES TO THE NORTH ANNA ESP APPLICATION

1. Revise the North Anna ESP application to reflect responses to VDEQ comment letter.