



## Virginia Doesn't Need New Reactors at North Anna

Dominion is in the process of applying for an Early Site Permit to site up to two new reactors at the North Anna site in central Virginia. The North Anna site sits on the shores of Lake Anna. Despite a long process of public intervention and a recent revision of the cooling system for the reactors, serious issues remain. Building new reactors will have negative impacts on the lake community and the region, and are not necessary to meet Virginia's electricity needs.

### **STRESS ON LOCAL AND REGIONAL WATER RESOURCES**

#### *Increased water evaporation*

The North Anna Power Station is already the largest water user in Louisa County. Building new reactors at Lake Anna will increase water evaporation and lower lake water levels. Dominion initially proposed a once through cooling system – a process which uses a large amount of water to directly cool the reactor and then dumps the hot water back into the lake for the third reactor. This system would have evaporated water at a rate of 26 cubic feet per second (cfs). In June 2006, Dominion revised its license application to use a cooling tower system instead of the once-through system. Although the hybrid cooling tower system will intake much less water overall and reduce the heat dumped into the lake, it will increase the overall amount of water lost to evaporation. In its most common mode, the cooling system will lose 37.2 cfs to evaporation. In its maximum water conservation (WCM) mode, the new cooling tower system will lose 25.7 cfs – about the same as the once through system.<sup>1</sup> This level of water evaporation during droughts will have unacceptable impacts for those who live near the lake and downstream. The Spotsylvania County Board of Supervisors - which passed a resolution in February 2005 expressing displeasure with the ESP process and raising concerns about the impacts of water loss on lake residents – continues to oppose the reactors for these reasons.

#### *Negative impact on lake recreation and fishing*

Increased water evaporation will decrease the level of the lake, especially during the summer and early fall. An estimated 43,000 people per year use Lake Anna for recreational fishing, and 10 to 15 times as many people use the lake for boating. In the 2002 drought, the water level dropped to 245 feet above mean sea level, which is 5 feet lower than normal. Boats could not be launched from ramps on the lake, and the backyards of homes around the lake were mudflats. Any decline of the lake for recreation and fishing could also threaten Lake Anna property values.

#### *Threat to downstream fisheries*

High water evaporation will also lower the water levels of the North Anna River downstream from the lake. In a letter to DEQ in June, the Virginia Department of Conservation and Recreation said, “We continue to be concerned about the affects water consumption at the project will have on downstream flow rates in the North Anna River during low flow periods.” The legal minimal flow rate of water that must be maintained over the North Anna dam (between the lake and the river) is only 5.4% of the natural flow. Additional reactors would increase the frequency and duration of these low flow periods, possibly threatening the American shad and stripped bass downstream. The hybrid cooling tower system is no better than the once through system in addressing these concerns, and in fact, may be worse. Because fish require a certain amount of water in which to spawn, frequent low water levels could have a negative impact on these populations and the health of Virginia's fisheries. Dominion has not collected sufficient data concerning these populations, so it is impossible to fully evaluate the potential impacts.

#### *Increased drinking water conflicts*

Four downstream counties (including Hanover) are considering using the North Anna River or the Pamunkey River as future water sources to meet projected growth. While presently none have pursued this course, future water shortages

could mean increased competition for water and further stress on river water levels. Dominion has failed to consider future community water needs and has ignored the fact that the North Anna site is adjacent to one of the fastest growing regions of Virginia.

#### *Problems with hot side of the lake*

Dominion has taken no steps to reduce the thermal impacts from the existing reactors on the south side of the lake, often referred to as the “hot side of the lake.” Dominion’s claim that this area is its private Waste Heat Treatment Facility and its assertion that regulation and monitoring of water temperatures do not apply there is private misuse of a public resource. Many residents live on the hot side of the lake. There is no reason for that part of the lake to be treated differently; water temperature and water quality should be monitored and regulations enforced.

#### *What should you ask the Virginia Department of Environmental Quality to do?*

**DEQ should hold to the standards necessary to protect local water by requiring Dominion to use a dry cooling tower for both of the proposed reactors, which would avoid increased water evaporation.**<sup>2</sup> As the Virginia Department of Conservation and Recreation states in a letter to DEQ on July 27, “Every effort should be made in design of the two new units to minimize the amount of water that will be required to operate them.” There is no reason Dominion should not take this step to protect lake residents, the community water supply, and downstream fisheries.

#### *What should you ask of the Nuclear Regulatory Commission?*

**NRC should not grant Dominion an Early Site Permit for new reactors at North Anna.** NRC should improve and clarify its analysis of water evaporation in the Supplemental Draft Environmental Impact Statement and require Dominion to better protect local water.<sup>3</sup> NRC should also evaluate issues like waste and security in the ESP process, and should reevaluate the potential of renewable energy resources in Virginia.

## **UNRESOLVED WASTE AND SECURITY RISKS**

#### *More waste pile up at North Anna*

Building two new reactors at North Anna will also mean additional waste will be generated and stored near the lake. Each reactor generates approximately 20 metric tons of highly radioactive waste per year – material that is extremely dangerous to human health. Over 54,000 metric tons of irradiated fuel have already accumulated at commercial nuclear reactors across the United States.

#### *No solution for nuclear waste*

No country in the world, including the United States, has a solution for permanently and safely managing its nuclear waste. Yucca Mountain - the only proposed permanent repository for nuclear waste in the United States - is beset with numerous unresolved scientific problems concerning its geologic and hydrologic suitability, and may never open. Reprocessing - the chemical process of extracting plutonium from irradiated fuel after it is removed from a reactor – is extremely expensive, poses a security threat, contaminates the environment, and does not eliminate the need for a repository.

#### *Radioactive waste leaks*

France - the world leader in nuclear power - has waste leaking storage sites in the Normandy and Champagne regions threatening wine and dairy production. In the U.S., tritium - a radioactive isotope of hydrogen – has leaked from nuclear power plants into the groundwater at the Braidwood, Byron, and Dresden reactors in Illinois, the Palo Verde reactors in Arizona, and the Indian Point nuclear plant near New York City. In some cases, the nuclear industry knew about these leaks years in advance, but did not tell the Nuclear Regulatory Commission or the local communities near the plants.

#### *New reactors mean additional safety risks*

New reactors at North Anna would also bring increased security risks to the region, including the possibility of attacks and accidents. Considering the devastation that could result from a successful terrorist attack on a nuclear plant, ensuring their protection should be a priority in a post-September 11 environment. However, the U.S. Nuclear Regulatory Commission (NRC) and nuclear industry are leaving plants vulnerable. Reactors still have inadequate defenses and security tests. Investigations have found a serious mismanagement at several reactor facilities, where the emphasis was put on the corporate bottom line and not safety, and the NRC was found to be complicit.

## RENEWABLE ENERGY CAN BETTER MEET VIRGINIA'S NEEDS

Virginia's choices are not limited to new nuclear and coal plants. In fact, it is technically and economically feasible for a diverse mix of existing renewable energy technologies to completely meet Virginia's electricity needs over the coming decades. These renewable resources can be harnessed effectively and reliably, and without producing carbon emissions, radioactive waste, or other significant pollution. According to National Renewable Energy Laboratory (NREL) data in a recent Virginia Center for Coal and Energy Research (VCCER) study, Virginia's electricity needs can be fully met in the coming decades by wind, solar, advanced hydroelectric power, and geothermal heat pumps. According to NREL's data:

- Virginia's wind potential comes to over 104.4 million megawatt hours (MWh) – over 92% of Virginia's total annual electricity consumption
- Virginia's PV solar potential is 25,225 megawatts by 2025, which would generate over 46 million MWh annually – about 41% of Virginia's electricity use
- Geothermal heat pumps could also be used in Virginia to reduce the energy used for heating and cooling buildings by 30 to 60%.

For more information on how renewable energy can meet Virginia's electricity needs in the coming decades, see <http://www.citizen.org/documents/RenewableEnergyVirginia.pdf>

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## REFERENCES

<sup>1</sup> According to Dominion's revised ESP application (Part 3, the Environmental Report, p 3-5-6), the evaporation rate for the newly proposed wet/dry hybrid cooling tower is 37.2 cfs under its normal mode and 25.7 cfs under the Maximum Water Conservation (MWC) mode, which will only be used when water levels fall below 250 ft mean sea level. Although this 25.7–37.2 cfs range is equal or greater to the evaporation rate from the once through system, Dominion insists that the evaporation in the MWC mode (drought conditions) is all that is important. Dominion also asserts that the 25.7 cfs is a maximum instantaneous evaporation rate for the MWC mode, and that the “real” evaporation rate in that mode will be less, ranging from 19.4–23.4 cfs. They offer, however, no detailed analysis supporting this.

<sup>2</sup> The Virginia Department of Game and Inland Fisheries has recommended to DEQ that they raise the level of Lake Anna in order to increase water storage and lower the threshold lake level at which downstream flow is reduced. The Department, along with the Division of Water Resources, has also advised using the dry component of the cooling tower system more frequently than Dominion proposes, for instance in winter and spring months when it is not required by the lake level but would conserve water for the coming drier seasons. While these measures are positive and DEQ should definitely consider them, these measures would have their own impacts and would only marginally improve the situation.

<sup>3</sup> There are several problems with NRC's evaporation analysis in the SDEIS. The first confusing aspect is discussed in footnote one of this document. Another important example, however, is the NRC's presentation of the projected difference in “20 cfs events” between the present, the proposed cooling tower system, and original once-through system. In the SDEIS, NRC presents Dominion's brief analysis of this difference right before its own more detailed work, and yet when the two drastically differ, fails to mention or explain the situation. As a result, several state agencies are quoting Dominion's findings that, “The new cooling design is a significant improvement over the once through design in terms of limiting the total number of 20 cfs events created by operation of the third unit. The third unit causes small increases in the total number of days with flows of 20 cfs (7.3% vs. 5.2% of the time).” This seems to clearly be incorrect and in contradiction to NRC's own analysis.