



ENVIRONMENTAL IMPACTS OF NEW NUCLEAR REACTORS ON LAKE ANNA

Dominion is seeking to build up to two new reactors at its North Anna nuclear power station, which sits at the edge of Lake Anna in central Virginia. New reactors on Lake Anna threaten to push an already-tenuous lake ecosystem over the brink.



Dominion has applied with the U.S. Nuclear Regulatory Commission (NRC) for an Early Site Permit (ESP). If the ESP is granted, Dominion can apply for a combined construction and operation license for up to two new reactors at any time in the next 20 years.

Currently, two reactors are operating at Lake Anna, both of which use once-through cooling that withdraws a total of 1.9 million gallons of water per minute and discharges hot water back into the southern end of the lake. The health of the lake and the river downstream of the dam is negatively affected by the existing reactors. The addition of another reactor or two at the site would be detrimental.

- **Increased lake temperature threatens the striped bass population in the lake.** Hot water that is discharged back into the lake from the existing reactors negatively affects the striped bass, one of the most thermally-sensitive fish species in Lake Anna. The Virginia Department of Environmental Quality (VDEQ) calls the current conditions at Lake Anna “a tenuous situation” for the health of the striped bass population.¹ With an additional reactor using a once-through cooling system, the maximum daily surface temperature would increase by 3.6 degrees Fahrenheit near the dam and 2.8 degrees Fahrenheit near the intake pipe. According

to the Virginia Department of Game and Inland Fisheries (VDGIF), “it is likely that even a small increase in reservoir water temperature would have a dramatic effect – further reducing the already limited habitat and perhaps jeopardizing the entire striped bass fishery.”² In at least the summer and fall, the striped bass would be forced to move to the upper end of the lake with cooler waters, which could affect growth if the fish are not able to feed normally. Although the striped bass are stocked annually in the lake, additional stocking will have little effect if the fish do not grow and flourish in their habitat.

- **Lower lake levels negatively affect recreational activities and homeowners.** The size of the proposed Unit 3 would require withdrawing an additional 1.14 million gallons of water per minute – an increase of 60% over current conditions.³ According to VDEQ, the decreased water level “would adversely affect lake access and local economic conditions.”⁴ An estimated 43,000 people per year use Lake Anna for recreational fishing, and pleasure boating exceeds angler traffic by 10 to 15 times. Homeowners would experience adverse effects from lowered lake levels, such as decreased access to boat ramps and increased frequency of backyard mudflats. During the 2002 drought, the lake level dropped so low that boats could not be launched from most ramps.



Take Action! What you can do:

- Join PACE, the People's Alliance for Clean Energy. E-mail PACEvirginia@aol.com or call (202) 454-5130 for more information.
- Endorse our letter opposing new nuclear reactors at North Anna: http://www.citizen.org/cmep/energy_enviro_nuclear/nuclear_power_plants/nuclear_revival/esp/northanna/articles.cfm?ID=11601. Get other organizations and businesses to do the same.
- Contact your Senators and Representative (Capitol switchboard 202-224-3121) and ask them to oppose the construction of new nuclear facilities in Virginia; do the same for state and local officials.
- Write a letter to your local newspaper opposing new reactors on Lake Anna.
- Write a letter to or call Dominion asking them to focus on conservation, efficiency, and renewable energy rather than nuclear power; be sure to indicate if you are a Dominion customer or shareholder. Dominion, P.O. Box 26532, Richmond, VA 23261-6532, or 1-888-667-3000.

- **Increased water withdrawal endangers aquatic life in the lake.** The increased water withdrawal for an additional reactor will increase the mortality of fish and other aquatic species in the lake due to impingement or entrainment.⁵ According to VDGIF, measures taken to reduce impingement mortality for the two existing reactors are not sufficient to protect the Lake Anna fishery. With an additional reactor, the number of fish impinged on the mesh screen of the intake pipe would increase by 230% over current levels. The number of striped bass killed from impingement would nearly double. The number of entrained fish larvae would also double.
- **Decreased flow downstream of the dam threatens aquatic habitat.** An additional reactor would have severe impacts on aquatic life downstream of the North Anna Dam by increasing the frequency of reduced river flows from the dam. The result would be seriously degraded habitat for downstream aquatic life. With a third reactor, the frequency of low flow from the dam would increase from 5.3% to 11.8% of the year. VDEQ is concerned that "nearly perennial conditions of severe degradation will likely be created each fall" with an additional reactor.⁶ Periods of drought would exacerbate this problem.

- **Increased water withdrawals mean greater frequency of reactor shutdown.** When the lake level falls below 244 feet above mean sea level (ft msl), the existing plants are required to shut down. During the 2002 drought, the lake level was only one foot above the shutdown point. With an additional Unit 3, the level would have dropped 2.5 feet lower, which would have required the reactor to shut down. With another reactor, lake levels would fall to or below 244 ft msl 1.1% of the time. Dominion states that it could lower the shutdown elevation for the existing units to 242 ft msl, but this would further increase the frequency of low flow from the dam.

Footnotes:

- ¹ VDEQ, February 10, 2004 letter to Dominion page 5.
- ² VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 3.
- ³ When the lake level is 250 feet above mean sea level (ft msl).
- ⁴ VDEQ, February 10, 2004 letter to Dominion, page 11.
- ⁵ Impingement is the accumulation of fish and other aquatic life caught against the cooling water intake screen. Entrainment is the forced influx of aquatic life into the cooling system through the cooling water intake screen.
- ⁶ VDEQ, January 15, 2004 memo to VDEQ, page 4.

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Public Citizen, a non-profit consumer advocacy organization, has been fighting nuclear power for over 30 years.

