



OFFICE OF INSPECTOR GENERAL

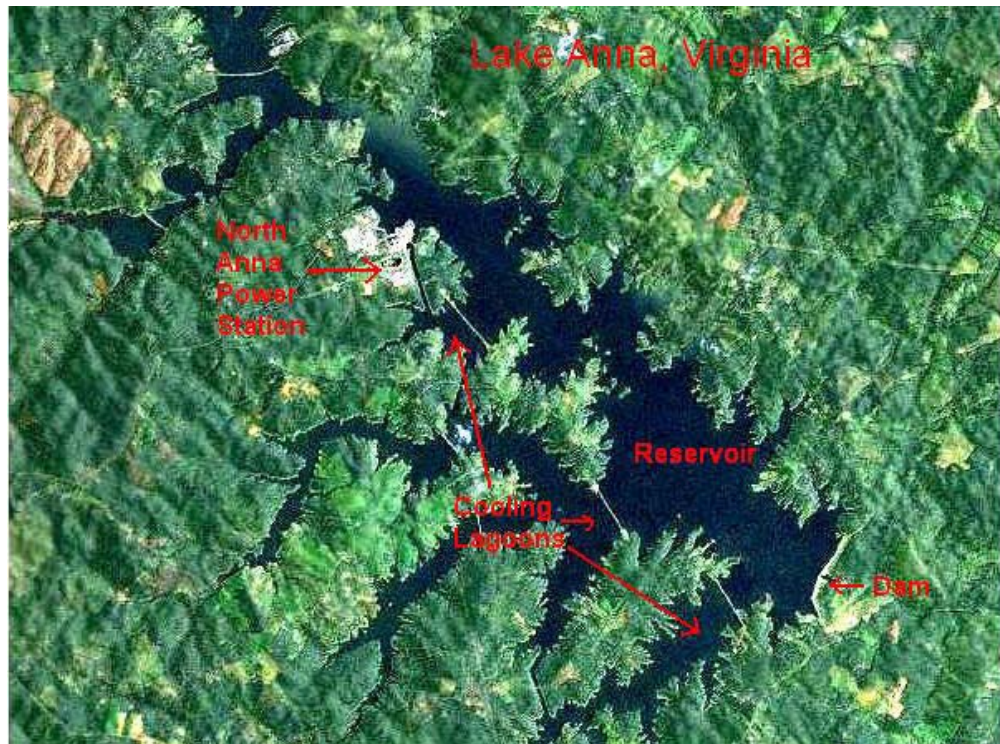
*Catalyst for Improving the Environment*

## Quick Reaction Report

# Decision Needed on Regulating the Cooling Lagoons at the North Anna Power Station

Report No. 2007-P-00038

September 20, 2007



**Report Contributors:**

Larry Dare  
Christine Baughman  
Michelle Brown

**Abbreviations**

Board	Virginia State Water Control Board
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FOLA	Friends of Lake Anna
MOU	Memorandum of Understanding
NAPS	North Anna Power Station
OIG	Office of Inspector General
VDEQ	Virginia Department of Environmental Quality
WHTF	Waste Heat Treatment Facility

**Cover picture:** A satellite image of Lake Anna in Virginia, obtained through the Website of MapQuest, Inc.



# At a Glance

*Catalyst for Improving the Environment*

## Why We Did This Review

We conducted this review in response to a complaint from the Friends of Lake Anna (FOLA), a citizens group, alleging that the water discharge permit for the North Anna Power Station (NAPS) inappropriately allows the cooling lagoons to be designated a waste heat treatment facility exempt from the Clean Water Act.

## Background

NAPS is located on Lake Anna, which has two parts: a 9,600 acre reservoir that provides water for the NAPS to operate, and 3,400 acres of lagoons to cool the water from the NAPS condensers before the water returns to the reservoir. Both parts of Lake Anna are used for recreation. By August 2005, FOLA identified concerns about the high water temperatures in the cooling lagoons.

For further information, contact our Office of Congressional and Public Liaison at (202) 566-2391.

To view the full report, click on the following link:  
[www.epa.gov/oig/reports/2007/20070920-2007-P-00038.pdf](http://www.epa.gov/oig/reports/2007/20070920-2007-P-00038.pdf)

## **Decision Needed on Regulating the Cooling Lagoons at the North Anna Power Station**

### **What We Found**

NAPS has a water discharge permit allowing it to discharge water from the cooling lagoons into the Lake Anna reservoir. Lake Anna is classified as Class III waters. The Virginia water quality standards for Class III waters include, among other factors, that the maximum temperature cannot exceed 32° Celsius, which is about 90° Fahrenheit. The current (and all prior) water discharge permits, as well as the draft permit being processed by the Virginia Department of Environmental Quality, exempts the cooling lagoons from the water quality standards because they are considered a waste treatment facility.

To protect those who use the cooling lagoons for recreational purposes, FOLA believes a water temperature limit should be placed on the cooling lagoons. For a variety of reasons, it believes the cooling lagoons are waters of the United States that can be regulated under the Clean Water Act. If so, the new water discharge permit can establish such limits.

Although the U.S. Environmental Protection Agency (EPA) authorized Virginia to administer the water discharge permit program in 1975, it retained the authority to review and, if needed, object to permits proposed by Virginia. The NAPS permit is the type that must be reviewed by EPA Region 3. Based on its review of the proposed permit, Region 3 officials may: not respond, object, or make comments or recommendations.

In view of the concerns raised by FOLA that the cooling lagoons should be designated waters of the United States, the permit review process by EPA is critical.

### **What We Recommend**

We recommend that the Region 3 Regional Administrator:

1. Decide whether additional time should be requested for the Region's review of the proposed permit for NAPS, in order to consider whether the cooling lagoons should be classified as waters of the United States under the Clean Water Act.
2. Consider communicating to the public that this review was performed.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
INSPECTOR GENERAL

September 20, 2007

**MEMORANDUM**

**SUBJECT:** Decision Needed on Regulating the Cooling Lagoons  
at the North Anna Power Station  
Report No. 2007-P-00038

**FROM:** Eileen McMahon *Eileen McMahon*  
Assistant Inspector General for Congressional and Public Liaison

**TO:** Donald S. Welsh, Regional Administrator  
Region 3

This is our report on the subject review conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established resolution procedures.

The estimated cost of this report – calculated by multiplying the project's staff days by the applicable daily full cost billing rates in effect at the time – is \$54,900

**Action Required**

In accordance with EPA Manual 2750, you are required to provide a written response to this report within 90 calendar days. You should include a corrective actions plan for agreed upon actions, including milestone dates. We have no objections to the further release of this report to the public. This report will be available at <http://www.epa.gov/oig>.

If you or your staff have any questions, please contact Paul McKechnie at 617-918-1471 or [mckechnie.paul@epa.gov](mailto:mckechnie.paul@epa.gov), or Larry Dare at 202-566-2138 or [dare.larry@epa.gov](mailto:dare.larry@epa.gov).

## **Purpose**

In November 2006, the U.S. Environmental Protection Agency (EPA) Office of Inspector General (OIG) Hotline received a complaint from the Friends of Lake Anna (FOLA). FOLA is a citizens group created to protect Lake Anna and its surrounding landscape. Based on their complaint, we performed work to determine whether EPA Region 3 provided oversight of the Virginia Department of Environmental Quality's (VDEQ's) actions affecting environmental factors at Lake Anna. Our primary objective was to answer the following question:

How should EPA respond to allegations that the water discharge permit for the North Anna Power Station inappropriately allows the cooling lagoons to be designated a waste heat treatment facility and, therefore, exempt from the Clean Water Act?

The North Anna Power Station (NAPS) is a nuclear power generating facility located next to Lake Anna, near Mineral, Virginia. VDEQ staff are reissuing the water discharge permit for NAPS. According to FOLA, the permit, as drafted, does not properly address the cooling lagoons associated with the NAPS: the NAPS cooling lagoons should be treated as waters of the United States, in accordance with the Clean Water Act.

## **Background**

Lake Anna is used for both recreational purposes and to provide water for the nuclear reactors at the NAPS. Formed from impounding the North Anna River, there are two parts to Lake Anna: a 9,600 acre reservoir and 3,400 acres of cooling lagoons. These cooling lagoons are also referred to as the waste heat treatment facility (WHTF), the "warm side," and the "private side" of Lake Anna. Three dikes separate the reservoir and cooling lagoons. Water needed by NAPS is withdrawn from the reservoir, passed through the condensers at the power station, released into the cooling lagoons to dissipate the heat, and ultimately discharged back into the reservoir. Reservoir water flows back into the North Anna River. At least 10 streams flow into the cooling lagoons.

On a summer weekend, approximately 8,000 people may be using the cooling lagoons for recreational purposes. Those with property on the cooling lagoons may go boating on them. However, boats cannot pass between the reservoir and cooling lagoons of Lake Anna. Although boat ramps are available so members of the public can launch boats into the reservoir, there are no public ramps into the cooling lagoons. No boats are allowed in the discharge canal carrying the water from the NAPS to the cooling lagoons. Several areas are available to allow the public to fish and swim in the cooling lagoons.

By August 2005, FOLA had identified concerns about the high water temperature in the NAPS cooling lagoons. Appendix A shows how high the water temperatures become during the summer months. For purposes of the NAPS water discharge permit, the lagoons are classified as a waste heat treatment facility under Virginia law. Accordingly, current permit temperature limits do not apply to the cooling lagoons. FOLA disagrees with this position. Regardless of when Virginia officials initially approved the original permit for the NAPS, FOLA asserts the

legal requirements are now different. The organization contends that the Clean Water Act applies to the cooling lagoons and requires that they be treated as waters of the United States.

The Clean Water Act provides for EPA oversight of actions by States authorized to implement the water discharge permit program. In 1975, EPA authorized the State Water Control Board to administer the permit program in Virginia. The EPA Administrator has the authority to review water discharge permits issued by an authorized State under Section 402 of the Clean Water Act. A permit may not be issued if the Administrator objects to it. According to a 1984 EPA delegation of authority, the Regional Administrator fulfills this responsibility by objecting to any permit proposed by a State that is outside the guidelines and requirements of the Clean Water Act. The Region 3 Regional Administrator re-delegated this authority to the Director, Water Protection Division. Throughout this report, statutory or regulatory references to the EPA Administrator should be deemed to refer to the Regional Administrator or his delegate.

### **Scope and Methodology**

We began our review in May 2007. We interviewed staff from EPA Region 3, the EPA Office of Water, VDEQ Northern Virginia Regional Office, VDEQ Division of Environmental Enhancement, and the U.S. Army Corps of Engineers. We reviewed various documents provided by these organizations, obtained from their Websites or from various other Websites, such as the Nuclear Regulatory Commission. We also reviewed documents provided by FOLA. We obtained information from EPA's data systems on similar water discharge permits, and on enforcement actions related to the existing permit for NAPS. Finally, we visited Lake Anna and toured a portion of the NAPS cooling lagoons.

We performed this review in accordance with generally accepted government auditing standards, issued by the Comptroller General of the United States, except that we limited our review of management controls and compliance to those directly relating to the issues identified in the complaint. Because computer-processed data were not significant to our findings, we did not determine if the data obtained were valid and reliable.

### **Lagoons Are Exempt from Water Quality Standards**

The Clean Water Act applies to navigable waters. The law defines navigable waters as waters of the United States. Federal regulations at Title 40 Code of Federal Regulations (CFR) 122.2 implementing the water discharge permit program define waters of the United States to include, in part, "(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams) ... (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes...." This definition also states "Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of C[lean] W[ater] A[ct] ... are not waters of the United States."

Virginia has classified Lake Anna as Class III waters and Lake Anna is also classified as waters of the United States. The water quality requirements for Class III waters include, among other things, that the maximum temperature cannot exceed 32° C (about 90° Fahrenheit). If the cooling lagoons were considered waters of the United States under the Clean Water Act, the

water temperature could not exceed 32° C without a variance. However, under the Virginia program, the cooling lagoons have been determined a waste treatment facility, so they are not subject to these water quality standards.

Virginia regulations provide an exclusion for waste treatment systems. Virginia has consistently applied the waste treatment system exclusion to the cooling lagoons at NAPS. In June 1968, before NAPS was built, the Virginia State Water Control Board (Board) considered potential thermal pollution to be the primary water quality issue resulting from the NAPS discharge. Treatment facilities proposed to prevent the thermal pollution of the North Anna River included constructing dikes to create three interconnected, heat dissipating impoundments totaling 3,500 acres. The Board's staff considered the proposed cooling system to be soundly based and conservative. The resulting permit was issued in accordance with a 1950 Virginia law. It allowed treated industrial waste from the proposed NAPS to be discharged into the North Anna River.

### **Region 3 Must Review the Proposed Permit**

Federal regulations require Region 3 to review the permit for NAPS. Title 40 CFR 123.24(d) provides that the Regional Administrator cannot waive the right to review certain permits prepared by an authorized State. Types of facilities that the Region must review are (1) those with discharges of uncontaminated cooling water that exceed 500 million gallons per day, (2) a major discharger, or (3) within any of 21 industrial categories listed in appendix A to Title 40 CFR Part 122. NAPS meets all of these requirements: it discharges more than 500 million gallons of cooling water a day, it is a major discharger, and it falls in the category of a steam electric power generating point source.

The 1975 memorandum of understanding<sup>1</sup> (MOU) between Region 3 and Virginia's Board contains this review requirement. This MOU was executed as part of EPA's 1975 authorization of Virginia's permit program. It provides that the Regional Administrator may comment on or object to a proposed permit if significant adverse comments were submitted about the draft permit during the public comment period. Such comments were submitted. The MOU also requires the Regional Administrator to submit any objection within 14 days after receiving the proposed permit. On September 7, 2007, a VDEQ official sent Region 3 the package on the proposed NAPS permit. Under the MOU, the Regional Administrator may take one of three actions regarding the proposed permit: not respond, object, or make comments or recommendations.

**Not respond.** The MOU provides that if the Regional Administrator does not provide any objections or significant comments on the proposed permit, after 14 days the staff (i.e., VDEQ) may submit its recommendations to the Board for action. In this case, unless the Board changes it, the permit proposed by VDEQ will be issued. Thus, if the Regional Administrator decides the status quo is appropriate, he may take no action. Once the permit is issued, any appeal would be governed by Virginia procedures.

---

<sup>1</sup> Titled *Memorandum of Understanding Regarding Permit and Enforcement Programs Between State Water Control Board and the Regional Administrator, Region 3, Environmental Protection Agency.*

**Object.** According to the Clean Water Act, section 402(a)(5), the Administrator may object to a permit proposed by an authorized State. In 1984, the Administrator delegated this authority to the Regional Administrators. Regulations at Title 40 CFR 123.44 identify the grounds on which the Regional Administrator may object. One basis for objecting is if the State Director misinterprets the Clean Water Act or any guidelines or regulations under that law, or misapplies them to the facts. Region 3 officials stated that they have discretion in reviewing water discharge permits and any decisions vetoing permits.

If Region 3 were to determine that the cooling lagoons should be regulated as waters of the United States, it may object to the proposed permit. Under the MOU, the Regional Administrator must inform Virginia officials of a possible objection within 14 days of receiving the proposed permit. Once notified, regulations at Title 40 CFR 123.44 provide that the Regional Administrator must send the State written details on the objection within 90 days of receiving the proposed permit. The Regional Administrator's objection should be resolved before VDEQ staff present the proposed permit to the Board for issuance. If the objection cannot be resolved, the Regional Administrator may need to issue the permit. In that case, Region 3 would administer the permit instead of VDEQ. Region 3 has indicated that this is not the preferred outcome with an authorized State. Region 3 officials indicated they would not object to this permit unless EPA's Office of General Counsel and Office of Water agreed that an objection was appropriate.

**Make comments or recommendations.** Without objecting to the proposed permit, Region 3 officials can provide comments or recommendations to the Board or VDEQ. In this case, the comments or recommendations might address the jurisdiction issue (as discussed previously) or issues about better protecting the recreational use of the cooling lagoons.

Region 3 officials could use the comment option to suggest additional steps for protecting people and the environment. For example, Region 3 officials might suggest that VDEQ work with the permit holder to voluntarily reduce water temperatures. Region 3 could suggest that the permit holder expand annual studies performed to verify that the temperature of the discharge is not causing any impairment to a healthy and diverse fish population in the lake or river. The studies might be expanded to include more sampling locations in the cooling lagoons, and a greater variety of aquatic life. For example, other aquatic species could be sampled in addition to fish.

## **Recommendations**

We recommend that the Region 3 Regional Administrator:

1. Decide whether additional time should be requested for the Region's review of the proposed permit for NAPS, in order to consider whether the cooling lagoons should be classified as waters of the United States under the Clean Water Act.
2. Consider communicating to the public that this review was performed.



## **Status of Recommendations and Potential Monetary Benefits**

RECOMMENDATIONS						POTENTIAL MONETARY BENEFITS (in \$000s)	
Rec. No.	Page No.	Subject	Status <sup>1</sup>	Action Official	Planned Completion Date	Claimed Amount	Agreed To Amount
1	4	Decide whether additional time should be requested for the Region's review of the proposed permit for NAPS, in order to consider whether the cooling lagoons should be classified as waters of the United States under the Clean Water Act.	O	Region 3 Regional Administrator			
2	4	Consider communicating to the public that this review was performed.	O	Region 3 Regional Administrator			

<sup>1</sup> O = recommendation is open with agreed-to corrective actions pending;  
 C = recommendation is closed with all agreed-to actions completed;  
 U = recommendation is undecided with resolution efforts in progress

***Water Temperatures in the Discharge Canal and Lagoons  
Regularly Exceed 32° C during the Summer***

Month	Highest Hourly Temperature (in Celsius)		
	Discharge Canal	WHTF Site 1	WHTF Site 2
June 1994	36.3	34.5	33.5
July 1994	37.4	35.8	34.4
August 1994	36.0	34.3	32.7
June 1997	*	34.1	32.2
July 1997	37.9	36.2	34.8
August 1997	37.7	35.6	33.6
September 1997	36.2	34.6	32.3
June 2000	37.4	36.6	32.3
July 2000	38.9	37.0	37.3
August 2000	37.3	35.0	33.8
June 2001	37.3	36.1	34.2
July 2001	37.3	35.0	33.1
August 2001	37.3	35.9	34.3
June 2002	37.4	36.1	34.4
July 2002	39.1	36.8	35.4
August 2002	39.5	37.3	35.3
July 2003	38.1	35.5	33.5
August 2003	38.5	36.4	34.7
September 2003	37.3	35.0	33.0
June 2004	35.7	33.8	32.4
July 2004	37.8	35.7	34.0
August 2004	37.6	35.6	33.7
September 2004	36.5	34.4	32.8
June 2005	36.7	34.7	33.1
July 2005	39.6	37.8	35.9
August 2005	39.8	37.6	35.6
September 2005	37.3	34.9	33.3
June 2006	36.3	34.3	32.7
July 2006	39.3	37.0	35.9
August 2006	40.5	38.0	36.7

\* = Missing data

Source: Attachment 11 to the Fact Sheet for draft permit VA0052451, obtained via [http://www.deq.virginia.gov/vpdes/northanna/VA0052451.Attachment\\_11.2007.pdf](http://www.deq.virginia.gov/vpdes/northanna/VA0052451.Attachment_11.2007.pdf)

***Distribution***

Office of the Administrator  
Assistant Administrator for Water  
Regional Administrator, Region 3  
Audit Followup Coordinator, Region 3  
Director, Water Protection Division, Region 3  
Regional Counsel, Region 3  
Director, Office of Public Affairs, Region 3  
General Counsel  
Agency Followup Official (the CFO)  
Agency Followup Coordinator  
Associate Administrator for Congressional and Intergovernmental Relations  
Associate Administrator for Public Affairs  
Director, Office of Regional Operations  
Acting Inspector General