

FRIENDS OF LAKE ANNA, VIRGINIA

FAX TRANSMITTAL

10 MAR 2011

TO: TAMSEN DOZIER (301) 415-2272

FAX TO NUMBER 301-415-5397

TOTAL # of PAGES (including this form) 17

FROM: Harry Ruth for the Friends of Lake Anna Virginia

PHONE 540-872-3632

Please call if you have received this fax in error

RE: 10 MAR 2011 EMAIL CONCERNING ENVIRONMENTAL SAFETY REVIEWS FI NORTH ANNA UNIT 3 - LAKE ANNA, VIRGINIA.

PLEASE CALL 540-872-3632 WHEN YOU HAVE RECEIVED THIS FAX.

Thanks, Harry Ruth

Date 3/27/08

To: Boards of Supervisors (Louisa, Spotsylvania and Orange Counties) Dominion Resources
 VA Dept of Environmental Quality VA State Water Control Board VA Dept of Game & Inland Fisheries
 VA Dept of Conservation & Recreation VA Dept of Health U.S. & Virginia State Legislators
 U.S. Federal Nuclear Regulatory Comm. U.S. Environmental Protection Agency U.S. National Oceanic & Atmospheric Administration

SUBJECT: Concerns re declining lake levels at Lake Anna, Virginia

We the undersigned persons who recreate on the 13,000 acre Lake Anna Virginia and/or own property adjacent to the main reservoir and/or cooling lagoons of the lake or nearby areas and/or own or manage businesses that are affected by Lake Anna are very concerned about the declining water levels, increased water temperatures during the summer months and associated impacts to all forms of recreation in/on Lake Anna. We are also concerned that these declining water levels will:

- (a) create many boating hazards with previously submerged items (rocks, sandbars, etc.) and create major safety hazards for recreational users when their boats hit these submerged items;
- (b) cause the water to get hotter faster in the summer months to unsafe water temperatures causing negative impacts to humans, fish, wildlife, aquatic life, clams and mussels;
- (c) create a major fire safety hazard for lake homes/communities by making the dry fire hydrants unusable;
- (d) increase shoreline stabilization problems and
- (e) negatively impact many lake businesses with loss of customers.

Dominion states the addition of the 3rd nuclear reactor, will cause up to an additional 24 million gallons per day to be evaporated from the lake causing a doubling of the drought cycle and further lake level declines. Other alternative cooling methods (i.e. dry cooling that Dominion proposed for the 4th reactor) would not impact the lake level. It is requested that you use all available means at your disposal to find the methods to negate each of our concerns. We also request public participation in each step/review of the Instream Flow Incremental Methodology (IFIM) study for Lake Anna and the North Anna River being conducted as part of Virginia and the U.S. North Anna Early Site Permit (ESP) approval process. BUSINESS NAME (if applicable): _____

NAME (Print)	SIGNATURE	ADDRESS (St., City, State)	Type
BARBARA W KERR	<i>Barbara W Kerr</i>	104 Lake Ct Bumpass VA	H
Kathleen Young	<i>Kathleen Young</i>	313 Bear Castle Dr Bumpass VA	H
Ronald Young	<i>Ronald Young</i>	313 Bear Castle Dr Bumpass VA	H
Ronald Young	<i>Ronald W. Young</i>	313 Bear Castle Dr Bumpass VA	H
Kathy Gardner	<i>Kathy Gardner</i>	" " " " " "	H

Lake Anna Lake Level Task Force

Type = BR - Business (Real Estate) - BC (Business Construction) BL (Business Lake Recreation) BS - (Business Service)
 H = Homeowner DU = Day User (Fill in one under Type)

Lake Anna Fact's

Prepared by the Friends of Lake Anna (Jan 2011)

(Phone 540-872-3632)

Overview: Lake Anna is a 13,000 acre lake (3rd largest in state) located in Louisa, Spotsylvania and Orange Counties, Virginia. The main reservoir has 9,600 acres of water, while the cooling lagoons have 3,400 acres. There are approximately 5,000 private residences adjacent to the entire 220 mile shoreline. Over 100 Businesses, Marinas, Campgrounds, Motels, Realtors, Lake Anna State Park, etc. depend on the quality of the water and water level within the lake. The three counties depend on the high real estate assessments/taxes received from lake property owners. Ninety-nine (99) % of the heated water from the adjacent power plant circulates at 2 million gallons per minute. It goes from the power plant, through the cooling lagoons, dike 3, and back upstream in the main reservoir returning to the power plant for another cycle. As a result, the water in the cooling lagoons directly impacts both sides of the lake. The lake provides recreation for close to 3 million visitor recreation days annually to residents of the surrounding counties, plus frequent visitors from throughout Virginia, Washington D.C. and Maryland. Annually, the main Reservoir has 2,382,494 visitors, while the cooling lagoons has 587,028. Access to the lake is gained from residences, businesses, Lake Anna State Park and also the many state roads and bridges that span both sides of the lake.

Recreation on both the Main Reservoir and Cooling Lagoons of Lake Anna depends on water quality/water level and includes: Boating, boat regatta's, jet-ski's (personal water craft), tubing, para-sailing, wake boarding, water skiing, sailing, canoeing, kayaking, swimming, tanning on the beaches, triathlons, fishing from both boats and on-shore, fishing tournaments, clamming, scuba diving and scuba diving training for our state police and fire/rescue personnel, gold panning, water critter studies, geo-caching, duck/goose hunting, 4th of July fireworks display, hiking on the shoreline, bird/eagle watching, picnics, sea-plane/ultra light landing areas and just fantastic relaxation opportunities to meditate, etc.

U.S. Government Agencies oversight of Lake Anna:

Nuclear Regulatory Commission (NRC)	Nuclear Power Plant + (Surrounding environment & safety) (appears primarily on-site)
Environmental Protection Agency (EPA)	Protecting Lake Anna Water- U.S. Clean Water Act for (Main Reservoir only) but Dominion has 316A Variance exemption so minimal protection. No protection for Cooling Lagoons. Oversight delegated to Virginia Dept of Environmental Quality. BREDL lawsuit is challenging no cooling lagoon protection. Va. Supreme Court to decide
Federal Energy Regulatory Commission (FERC)	Concerned with Lake Anna Dams & Dikes, plus electrical generators in dam
U.S. Army Corp of Engineers	Dredging within the lake + Wetland disturbance
National Oceanic Atmospheric Administration (NOAA)	Administers U.S. Coastal Zone Management Act - re any federal permits. Delegates Administration to VA. (Dept of Environmental Quality) - Has Enforceable/Advisory policies
Homeland Security	Terrorist protection
Commonwealth of Virginia oversight	
Department of Environmental Quality	Delegated administration of: U.S. Clean Water Act (NRC) + Coastal Zone Act (NOAA), National Environmental Policy Act (NEPA) .Executive Agency for the Va. State Water Control Board
Department of Health	Water Quality/Health of Individuals (Will post caution signs if water becomes unhealthy)
Department of Game & Inland Fisheries	Fishing/Clams/Hunting/Water Buoy's/Water Law Enforcement of Boating/Fishing laws, Eagle Habitat & other protected species.
Department of Conservation & Recreation	All forms of recreation, plus the Lake Anna State Park
Virginia Tourism Corporation	Promotes tourism within Virginia
Department of Transportation	Roads & Bridges that span both sides of the lake.
Department of Historic Resources	Historical Cemeteries
Louisa, Spotsylvania & Orange County Oversight	
Board of Supervisors	Protecting Health, Safety & Welfare of County Residents Building permits at Power Plant for future construction (Louisa) Nuclear Dry Cask Storage (Land Use Permits - Life ??) = (Louisa County protection ??) Land Disturbance at Power Plant for future construction (Louisa) Water Quality (Septic Fields, Wells, Tritium, run-off from adjacent land/farms) - Drinking Water Proposed Louisa county water/sewer system for future growth around the lake.
Spotsylvania & Louisa County Sheriff's	Law Enforcement on and surrounding the lake

Waste Heat Treatment Facility

10 JAN 2011

Cooling Lagoons

North Anna Power Station uses water from Lake Anna to condense steam back to water inside the station. The water is returned to the lake slightly warmer than when it was taken. The discharged water cools in a series of private cooling lagoons, known as the Waste Heat Treatment Facility (WHTF). When North Anna is in full operation, approximately 2,000,000 gallons of water pass through the station per minute.

Reservoir and WHTF Background

Lake Anna was developed to provide cooling water for North Anna.

It was originally timberland and some farmland. When construction of North Anna began, the area that would become the lake bottom was completely cleared in 1968 before filling with water.

In 1972, the North Anna River was impounded, forming Lake Anna and the adjacent Waste Heat Treatment Facility.



Lake Anna is 17 miles long, 1 1/2 miles wide, and offers 200 miles of shoreline. There are 9,600 acres in Lake Anna and 3,400 acres in the private WHTF. In 1972, the Commonwealth of Virginia stocked the lake with 5 1/2 million fish, and it is restocked periodically. Some 33 species of fish thrive in the lake, including largemouth bass, striped bass and catfish.

Lake Anna Conditions

Lake Anna's water level and temperature readings are updated once each weekday. The temperature is measured in water being drawn directly from the main lake into the station's intake. The lake level is based on feet above sea level as measured at the main dam.

Date	Temperature (deg. F)	Lake Level (ft.)	
1/10/2011	43	248.7	DOWN 15.5"

MAIN RESERVOIR

COOLING LAGOON'S DOWN 27"

APPROX - 1 FOOT DIFFERENCE IN LEVELS

Discharge Water Temperature

By design, the temperature of the discharge water is typically 14 degrees warmer than the intake water. Intake temperatures can fluctuate with seasons or weather conditions. View the current temperature of the discharge water below as it initially leaves the station. The data is updated approximately every 15 minutes. ("Refresh" your browser for the latest reading.)

Water Temperature - Station Discharge

Date	Time	Degrees F
Jan 10	1300	65.32
Jan 10	1245	65.34
Jan 10	1230	65.32
Jan 10	1215	65.29
Jan 10	1200	65.26
Jan 10	1145	65.23
Jan 10	1130	65.28

DISCHARGE TEMP 65.32

INPUT TEMP 43.00

22.320 DIFFERENCE

WATER HEATED BETWEEN MAIN RESERVOIR & COOLING LAGOONS

Cooling System

The process of generating electricity at North Anna begins with the fission, or splitting, of uranium atoms in the reactor vessel. The vessel is filled with water (not from the lake), which controls, or moderates, the fission process, and removes heat from the reactor core. This water is kept under very high pressure, which prevents it from boiling although it is heated to three times the normal boiling temperature.

This hot, pressurized water is pumped to nearby steel containers called steam generators. In the steam generators, the water passes through thousands of small U-shaped tubes — about the diameter of your little finger — transferring its heat to a second, slightly cooler water system. This secondary water becomes steam, which travels through large pipes to spin the turbines in the adjoining building.

Spinning at 1,800 RPM, the turbines drive a generator that produces electricity. The steam then is condensed back to a liquid by a third cooling system before it returns to the steam generator to start the process again. The third cooling system's water comes from Lake Anna, and flows through the private WHTF before returning to the lake.

• [View an animation of the cooling process.](#)

Louisa County Tax Revenues from Lake Anna Residential Properties versus Dominion Power

(does not include Lake Anna commercial business revenues also received by Louisa County)

Produced by Friends of Lake Anna (FOLA) Jan 2011 Phone 540-872-3632

	LAKE ANNA PROPERTY OWNERS		DOMINION POWER		TAX CONTRIBUTIONS
	FY 06 (Jul 05-Jun 06)	FY07 (Jul06-Jun07)	FY08 (Jul 07-Jun08)	FY09 (Jul 08-Jun 09)	FY10 (Jul09-Jun10)
Dominion Revenue	\$ 11.0M	\$ 10.9	\$ 10.7	\$ 10.9	\$ 11.2
Dominion as % of Total	33.9%	28.4%	26.4%	26.0%	26.7%
Lake Properties Revenue	\$ 6.4M	\$ 8.4	\$ 9.5	\$ 10.0	\$ 10.0
Lake Properties as % of Total	19.7%	21.9%	23.5%	23.7%	23.8%

Note: (1) All revenue numbers above indicate millions of dollars

(2) Lake Anna properties occupy 3.7% of the total county land, while the property owners contributed 23.8% of Louisa County revenue in FY10 (Jul 09-Jun 10) versus Dominion's contribution of 26.7% for a total of 50.50% of Louisa County revenues.

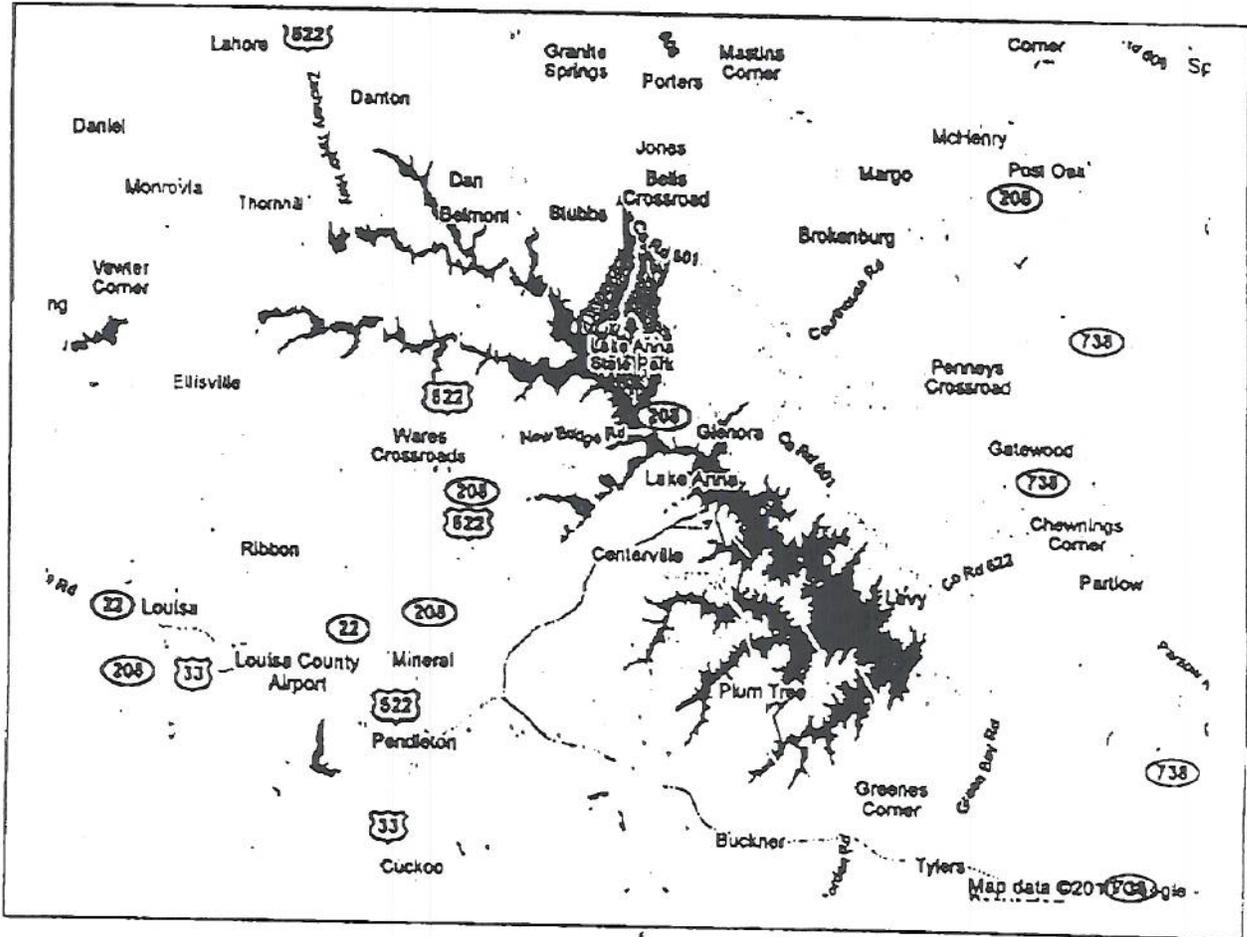
(3) Dominion revenues have remained fairly constant (10M – 11M) since 1997, while the Lake Anna Residential Properties revenue have increased from \$3.1M in FY02 to \$10.0M in FY10. A 223% increase in just 8 years.

(4) The Lake Anna Residential Properties which contributed 23.8% of Louisa County revenues are not mentioned as a separate line item in the Louisa County Comprehensive Annual Financial Report. Why ??

(5) Data received from Louisa county tax assessor and Louisa County Annual Financial Report



MAPS LAKE ANNA MAPS - LAKE ANNA, VIRGINIA



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Anna Coves	Public	Goldmine Cove	Private	Plum Tree Landing	Private
Anna Highview	Private	Gordon Sale	Public	Prince Dominion	Public
Anna Vista	Public	Governors Landing	Public	Pumunkey Point	Public
Anna Woods Estates	Public State Park	Grand View	Public	Purell Taylor	Public
Aspen Hill	Private	Hickory Landing	Private	Quarry Harbour	Public
Bear Castle I	Public	Holladay	Public	Rockland Creek Estate	Public
Bear Castle II	Public	Holladay Estate	Public	Rolling Woods	Public
Bear Castle III	Public	Holly Hill	Private	Rose Hill	Public
Bear Tree Cove	Public	Horseshoe Cove	Public	Rose Valley	Public
Beechwood	Private	Ioka Sunrise	Private	Rose Valley Cove	Public

Anna Coves	Public	Goldmine Cove	Private	Plum Tree Landing	Private
Anna Highview	Private	Gordon Sale	Public	Prince Dominion	Public
Anna Vista	Public	Governors Landing	Public	Pumunkey Point	Public
Anna Woods Estates	Public State Park	Grand View	Public	Purcell Taylor	Public
Aspen Hill	Private	Hickory Landing	Private	Quarry Harbour	Public
Bear Castle I	Public	Holladay	Public	Rockland Creek Estate	Public
Bear Castle II	Public	Holladay Estate	Public	Rolling Woods	Public
Bear Castle III	Public	Holly Hill	Private	Rose Hill	Public
Bear Tree Cove	Public	Horseshoe Cove	Public	Rose Valley	Public
Beechwood	Private	Ioka Sunrise	Private	Rose Valley Cove	Public
Bells Crossroad	Public	Irish Estates	Private	Runnymede	Public
Belmont	Public	Jay Lynn	No Access	Ruth Estates	Private
Belmont Shores	Public	Jerdone Island	Private	Sail Away Bay	Private
Belmont Woods	Public	Jones	No Access	Sailors Rest	Public
Blen Venue	Public	Kellys Landing	Public	Sandy Point	Private
Blounts Harbour	Public	Lake Anna Estates	Public	Scott McCoy I	Public
Bluewater	Public	Lake Anna Plaza	Public	Scott McCoy II	Public
Both Waters Estates	Public/Private	Lake Anna Woods	Public	Sec "A"	No Access
Boxwood Farm	Public	Lake Wind	Public	Sec "B"	No Access
Brandywood Estates	Private	Lakeridge Estates	No Access	Sec "C"	No Access
Buds Bridge	Public	Lakeshore Woods	Public	Seclusion Estates	Public
Bull Frog Bend	Public	Lakeside Woods	Public	Seclusion Shores	Private
Busbees Point Cove	Private	Lakeview Farms	Public	Seymour	Public
Cabin Cove	Private	Lakewood Estates	No Access	Shorewood	Public
Cartons Landing	Public	Lakewood Landing	Private	Sorble Cove	Private
Carolyn Hall	Public	Lands End	Public	South Wind Shores	Public
Cats Paw	Public	Levy	No Access	Stonewall Estates	Public
Centerville	No Access	Lewisdon	Public	Stubbs	Public
Cheryllington	No Access	Long Acres	Private	Stubbs Lakeview	Public
Childs Cove	Public	Longway	Private	Stubbs Overlook	Public
Clearview Shores	Public	Lorwood	No Access	Summer View Point	Public
Clearwater	Public	Lost Cove	Public	Sunning Hills	Public
Contrary Creek	Public	Magnolia Harbour	Public	Sunrise Bay	Public
Contrary Forest	Public	Maple Springs	Public	Sunset Harbour	Public
Countryside on Lake Anna	Public	Millpond Coves	Private	Sycamore Shoals	Public
Covenant Cove	Private	Mitchell	Public	Tall Pines	Public
Crosswinds	No Access	Moorfields Landing	Private	Tara Shores	Public
Crystal Cove	Private	Morgan I	Public	Tara Woods	Public
Cuckoos Nest	Private	Morgan II	Public	The Country	Public
Cutalong	Public	Mystic Point	Public	The Cove	Private
Don	No Access	Noah's Landing	Private	The Waters at Lake Anna	Private
Dovey Luck	Public	Oak Grove Estates	Public	Thella Shores	Public
Drye	Public	Oak Landing	Public	Thelma Winston	Private
Dukes Plantation	Public	Oakleigh I	Private	Twin Lakes Estate	Private/Public
Dukes Retreat	Public	Oakleigh II	Private	Twin Oaks	Public
Eagles Cove	Private	Oakridge	Public	Tyler View	Public
Edgewood Bay	Public	Overton Fork	Private	Valentine Woods	Public

Public - 36
PRIVATE - 11

32
15

37
10

47

Edna Johnson Moodys	Public	Panamint Shores	Private	Village of Lake Anna	Private
Equestrian Landing	Public Beach	Park Lane	No Access	Walters Quarter	Public
Faruki	Public	Paynes Shores	Public	Wares Crossroads	No Access
Fishermans Cove	Public	Peaceable Kingdom	Public	Water Side	Public
Forest Hills	Public	Pigeon Run Estates	Public	Waters Edge	Public
Fox Run Crossing	Public	Pine Forest Estates	Public	Whispering Pines	Public
Foxwood Manor	Private	Pine Harbour	Public	White Owl Landing	Public
Frazers Landing	Public	Pine Meadows	No Access	Wildwood on Lake Anna	Public
Fredericks Hall	No Access	Pine Point	Public	Windwood Coves	Public
Freshwater Estates	Public	Pleasant View	Public	Winston	Public
Georgetown	Public	Pleasure Island	Public	Woodberry Farms	Public
Glenora	Public	Plum Tree	Private	Wyndemere	Public

12

Public 11
 PRIVATE 1

10
 2

11
 1

For issues, support, suggestions, please feel free to contact us.

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SOURCE: WWW.LAKEANNA.MAPS.COM

47
 12

 59
 X3

 177

SUBDIVISIONS
 ON
 LAKE
 ANNA
 4/26/10

WATER GOING OVER DAM 300 CFS
 WHILE COOLING LAGOONS DOWN
 10", - MAIN RESERVOIR DOWN 2.4 INCHES

7 MAR 2011

Harry Ruth

193, 881, 600 GALS LOST
 OVER DAM

From: "Harry Ruth" <HC.RUTH@LOUISA.NET>
To: "Walter Michalski" <walterjoseph@hughes.net>
Cc: "Ken Remmers" <remmerskd@verizon.net>; "George & Gerry Heino" <Gmheino@earthlink.net>;
 "Bob & Jo Richards" <twolakelovers@yahoo.com>; "Steve (Ski) & Cheryl Monoski (Both Waters)"
 <swmonoski_101@yahoo.com>; "Dan Byers (LCBS - Jackson)" <lcbs_jd@louisiana.org>; "Willie Gentry
 (LCBS - CD)" <lcbs_cd@louisiana.org>
Sent: Monday, March 07, 2011 3:50 PM
Subject: Dominion currently releasing over 300 cubic feet per second, while cooling lagoons down 10".
 Wait,

See below for the original memo as requested, plus after the huge rain, Dominion is currently releasing over 300 cubic feet per second over the dam, while the cooling lagoons are down 10" from the design level of 251.5 MSL. See below website for online real-time data.

1. To find out the current water level on the cold side at the power plant and also the discharge water temperature on the warm side go to Dominion website.

<http://www.dom.com/about/stations/nuclear/north-anna/waste-heat-treatment-facility.jsp>

Currently the Main Reservoir is at the 249.8 MSL water level (2 inches below the design level of 250.0), and the Cooling Lagoons are 10 inches below the design level of 251.5 MSL. A difference of 8" in water level between the two sides. If Dominion was managing the water level correctly both sides would be at the design level now based on what they are releasing over the dam.

2. To find out how much water is going over the dam, go to U.S. G. S. website.

http://waterdata.usgs.gov/va/nwis/uv/?site_no=01670400&PARAMeter_cd=00065,00060,62620,00062

When the water level on the main reservoir is below 250 MSL, then Dominion is only supposed to release 40 Cubic Feet per second over the dam. Today according to this U.S. Govt website, Dominion is releasing 300 cubic feet per second. All of this is occurring while the cooling lagoons water level is down 10" from the design level of 251.5 MSL.

Harry

Waste Heat Treatment Facility

Cooling Lagoons

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Reservoir and WHTF Background

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Lake Anna Conditions

Lake Anna's water level and temperature readings are updated once each weekday. The temperature is measured in water being drawn directly from the main lake into the station's intake. The lake level is based on feet above sea level as measured at the main dam.

Date Temperature (deg. F) Lake Level (ft.)

3/7/2011 50 249.8

MAIN RESERVOIR
DESIGN LEVEL 250.0MSL
DOWN 2" FROM

COOLING LAGOON
DOWN 10" FROM DESIGN LEVEL
257.5 MSL

DIFFERENCE 8"↑

Discharge Water Temperature

By design, the temperature of the discharge water is typically 14 degrees warmer than the intake water. Intake temperatures can fluctuate with seasons or weather conditions. View the current temperature of the discharge water below as it initially leaves the station. The data is updated approximately every 15 minutes. ("Refresh" your browser for the latest reading.)

Water Temperature - Station Discharge

Date	Time	Degrees F
Mar 7	1430	72.9
Mar 7	1415	72.9
Mar 7	1400	72.9
Mar 7	1345	72.9
Mar 7	1330	72.9
Mar 7	1315	72.8
Mar 7	1300	72.8

Cooling System

The process of generating electricity at North Anna begins with the fission, or splitting, of uranium atoms in the reactor vessel. The vessel is filled with water (not from the lake), which controls, or moderates, the fission process, and removes heat from the reactor core. This water is kept under very high pressure, which prevents it from boiling although it is heated to three times the normal boiling temperature.

This hot, pressurized water is pumped to nearby steel containers called steam generators. In the steam generators, the water passes through thousands of small U-shaped tubes — about the diameter of your little finger — transferring its heat to a second, slightly cooler water system. This secondary water becomes steam, which travels through large pipes to spin the turbines in the adjoining building.

Spinning at 1,800 RPM, the turbines drive a generator that produces electricity. The steam then is condensed back to a liquid by a third cooling system before it returns to the steam generator to start the process again. The third cooling system's water comes from Lake Anna, and flows through the private WHTF before returning to the lake.

» [View an animation of the cooling process.](#)



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National Water Information System: Web Interface

[USGS Water Resources](#)

Data Category: Real-time Geographic Area: Virginia GO

[News](#) - updated November 2010

- Additional information:
 - Annual Water Data Reports: [Water Years 2002-09](#)
 - Historical instantaneous flow data for Virginia: [Instantaneous Data Archive - IDA](#)
 - National Weather Service Advanced Hydrologic Prediction Service: [River forecasts](#)

USGS 01670400 NORTH ANNA RIVER NEAR PARTLOW, VA PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site Time-series: Real-time data GO

Station operated in cooperation with Virginia
Dominion Power

Current shift adjusted stage-discharge rating table. These tab delimited tables are updated daily and can change frequently. If you use these ratings, it is important that you update often so that you have the most current version.

[What is a shift adjusted stage-discharge rating?](#)

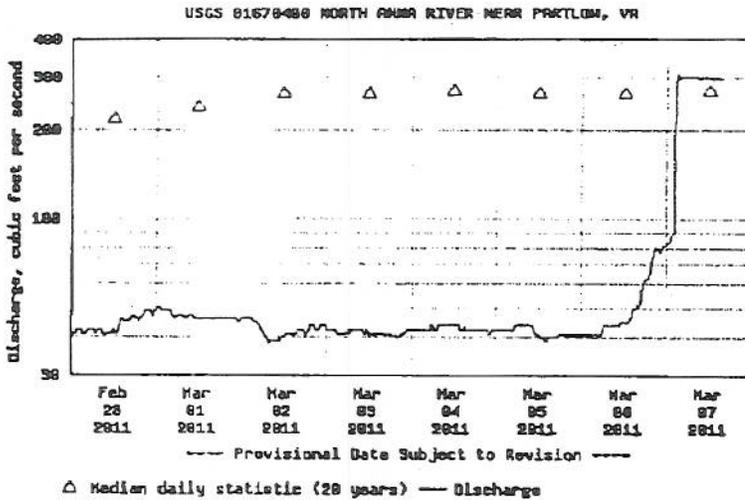
[Boating safety tips](#)

Available Parameters <input type="checkbox"/> All 2 Available Parameters for this site <input checked="" type="checkbox"/> 00060 Discharge <input checked="" type="checkbox"/> 00065 Gage height	Output format <input type="checkbox"/> Graph <input type="checkbox"/> Graph w/ stats <input type="checkbox"/> Graph w/o stats <input type="checkbox"/> Table <input type="checkbox"/> Tab-separated	Days <input type="text" value="7"/> (1-120)	GO
--	---	--	----

Summary of all available data for this site

Discharge, cubic feet per second

Most recent instantaneous value: 295 03-07-2011 15:15 EST



GRAPH - WATER GOING OVER LAKE ANNA DAM FEB 28 - MAR 7, 2011

300 CUBIC FEET PER SECOND
 $\times 448.8$
 134,640 GALS @ MINUTE
 $\times 60$
 8,078,400 GALS @ HOUR
 $\times 24$
 193,881,600 GALS @ DAY

Create presentation-quality / stand-alone graph. Subscribe to WaterAlert

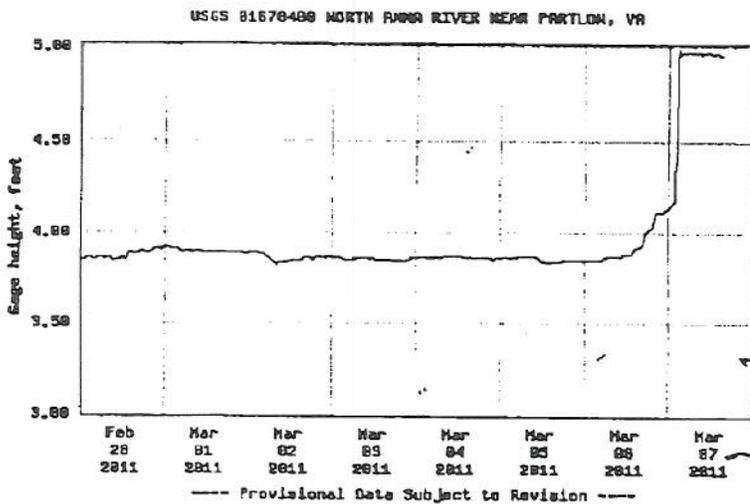
Daily discharge statistics, in cfs, for Mar 7 based on 20 years of record_morgs

Min (2009)	25th percentile	Median	Most Recent Instantaneous Value Mar 7	Mean	75th percentile	Max (1989)
44	188	269	295	587	647	2940

OVER DAM. WHILE MAIN RESERVOIR LAKE LEVEL DOWN 2.4 INCHES

Gage height, feet

Most recent instantaneous value: 4.96 03-07-2011 15:15 EST



COOLING LAKE DOWN 10 INCHES

CONVERT CUBIC FEET PER SECOND TO GALLONS PER MINUTE, HOUR, DAY

FACT: 7.48 GALS IN A CUBIC FOOT OF WATER
 CONVERSION FORMULA:
 $7.48 \times 60 \text{ SECONDS} = 448.8$

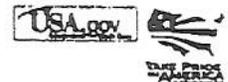
Create presentation-quality / stand-alone graph. Subscribe to WaterAlert

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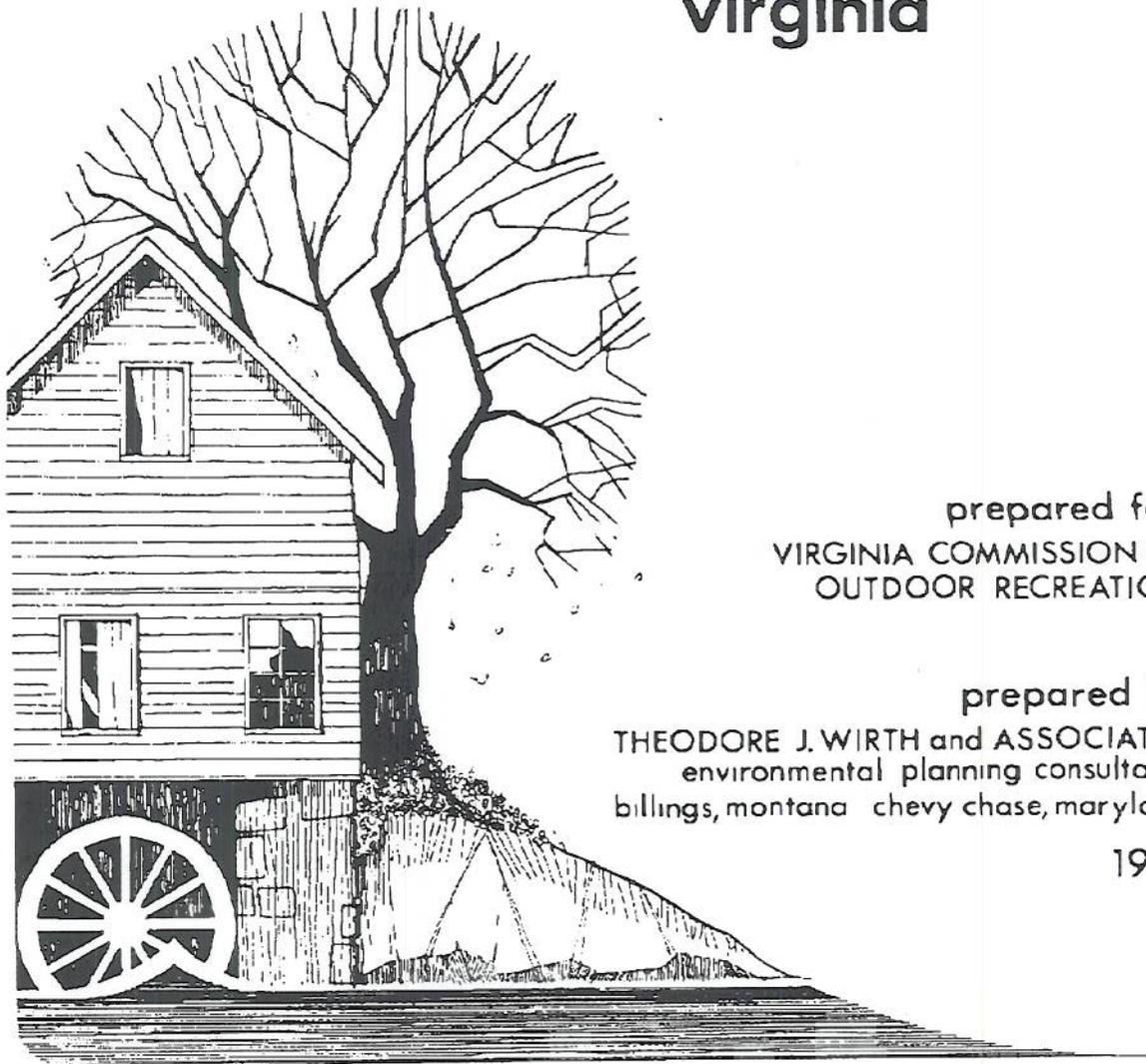
Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
 Title: USGS Real-Time Water Data for Virginia
 URL: <http://waterdata.usgs.gov/va/nwis/uv/>



Page Contact Information: [Virginia Water Data Support Team](#)
 Page Last Modified: 2011-03-07 15:31:05 EST
 2.37 2.38 vaww03

a land use plan for north anna reservoir virginia



prepared for
VIRGINIA COMMISSION OF
OUTDOOR RECREATION

prepared by
THEODORE J. WIRTH and ASSOCIATES
environmental planning consultants
billings, montana chevy chase, maryland

1971

acknowledgements

This Report was prepared by Theodore Wirth and Associates for the Commonwealth of Virginia, Commission of Outdoor Recreation. The consultant program was directed by Bruce Howlett. Contributing staff included Theodore Wirth, Conrad Wirth, Rodney Heller, Ben H. Thompson and Douglas Schofield. Dr. Gerald Lauer, Dr. Theodore Kneip and Dr. Edward Wren were responsible for studies of aquatic biology, water chemistry and radioactivity.

X
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competitive developments

The advent of the Salem Church project or the creation of new water based recreational developments nearby would, of course, completely change these prospects. Some of the market for North Anna would be siphoned off to other areas.

It should be borne in mind, however, that overall, the demand for recreation will continue to rise steadily. Increasing recreational demand is a statewide phenomenon. In total, the demand promises to exceed the supply for many years into the future. For North Anna, the advent of competitive recreation developments would act to slow the growth, but not entirely stop it.

vacation homes

Initially, the predominant type of development at North Anna Reservoir will be vacation homes.

The number of vacation homes that are built will lag behind lot sales. However, the rate of development will depend on the promotion activity of builders and the success of mobile home salesmen. Both of these types of housing can be expected to locate around the Reservoir. As the exterior appearance and size of mobile homes come to more closely resemble conventionally built homes, mobile homes may well become the predominant form of vacation residential development.

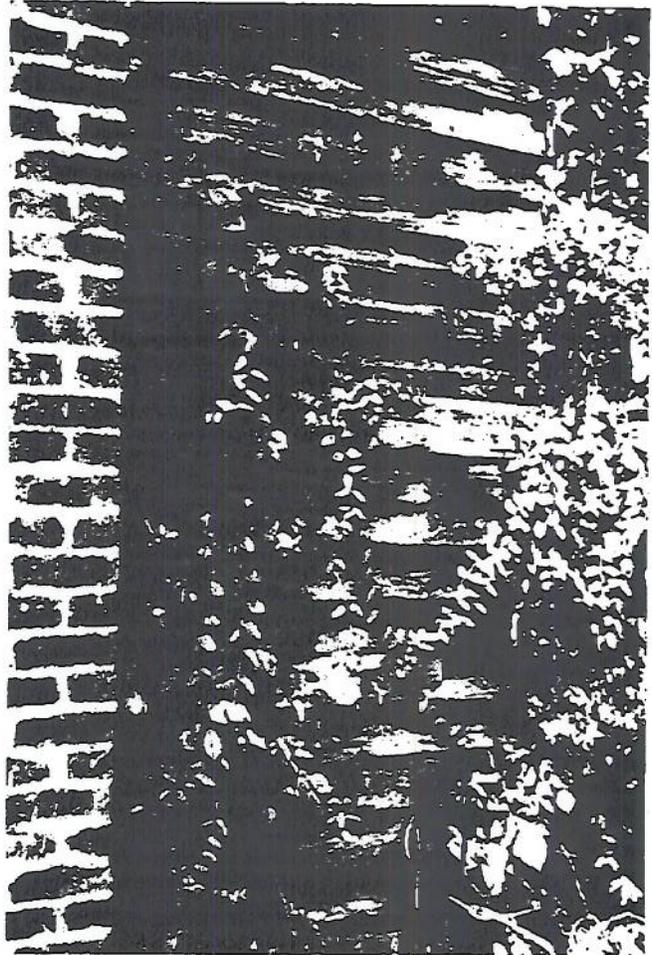
The value of vacation homes will vary in the extreme.

Inexpensive, minimal mobile homes or trailers will comprise the low end of the cost spectrum, while custom built homes costing many thousands of dollars will occupy the upper limits. From limited information secured about other recreational developments, the overall average value of future vacation structures around North Anna should be about \$10,000 to \$12,000 or more (including mobile homes in the average).

The number of vacation homes developed at North Anna Reservoir will vary from year to year depending on economic conditions, market demand and competitive opportunities. Demand will start somewhat slowly and grow as the Reservoir becomes better known and as travel times from major centers are reduced by improvements on highways leading to the Reservoir from the Interstate System.

A forecast of development potential must necessarily be conjectural for there is no precise way of knowing what the actual market demand will be. The competition that could arise (development of the Salem Church Reservoir for example) or future changes in county land use controls could completely upset any forecast. Under these circumstances, only a generalization of future prospects can be made.

With these conditions in mind, it is possible to conjecture a possible development of vacation homes around the Reservoir at between 4,500 to 6,000 by the year 2000.

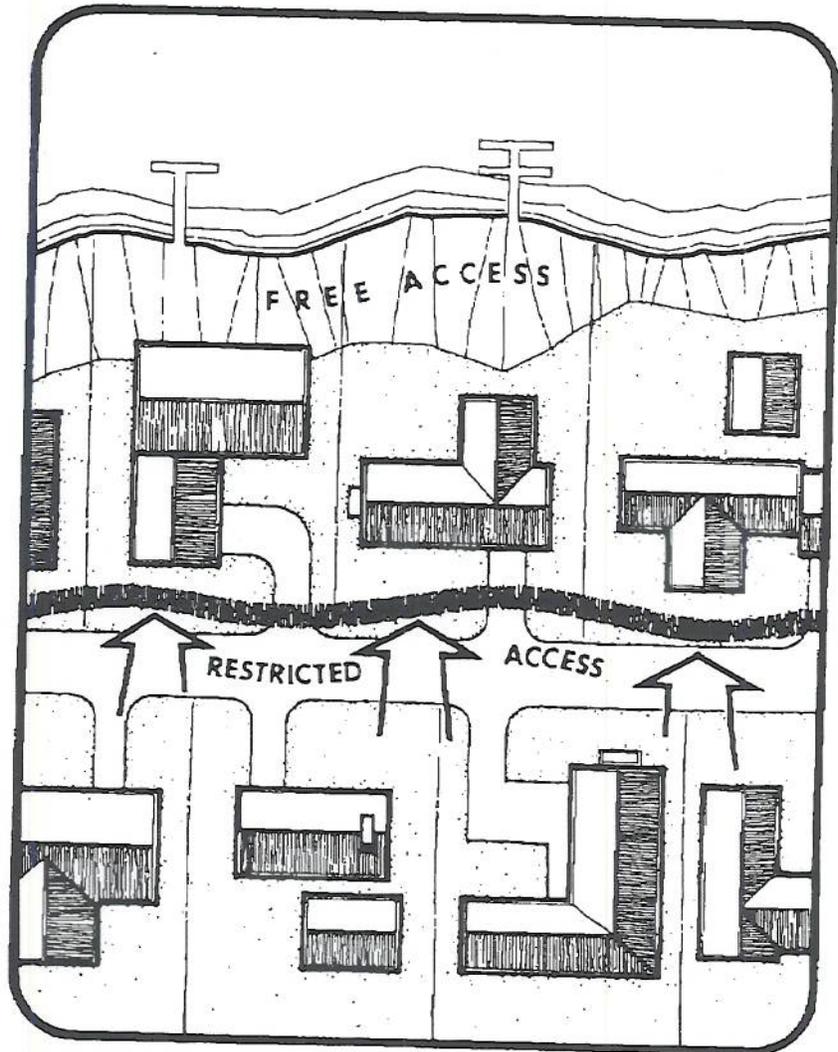


There is a caution to be borne in mind. If access to the shoreside is blocked by excessive sale of shorefront land to individual owners, then development will be throttled. If areas back of the shore cannot gain access to the water because the shorelands have been sold, then the only development that will occur will be one house deep all around the shoreline. This points to the need for good development procedures and the retention of points of access to the shore. Access should be provided both for the general public as well as for subdivisions which abut the shore. Examples of good land development procedures are contained in other sections of this Report.

permanent homes

A market for year round homes will also develop around North Anna Reservoir.

This market will develop slowly and will likely consist of employees from the VEPCO plant; some of the owners of new Reservoir related businesses; some residents from nearby communities (who will buy shoreside property, build, and eventually move to the Reservoir permanently); some people from Fredericksburg and Charlottesville who will build at the Reservoir and commute to work; and some retirees (whose number will increase over the years as the time comes for those who bought vacation homes to actually retire).



To some extent, this trend will depend on the availability of local services such as food, clothing, medical facilities and other necessities. At first, these needs will be satisfied by small stores that already exist around the Reservoir and by shops in Louisa, Mineral, Fredericksburg and Charlottesville. Major shopping trips will be made to Richmond or even Washington a few times each year. As time goes on and the permanent population grows, far more year round businesses will locate nearer the Reservoir.

From all sources for a permanent home population, it is reasonable to conjecture that about 200 permanent year round homes will exist around the Reservoir by 1980, in addition to summer home development. Another 300 or more should locate in the next five years with perhaps an additional 1,000 in the fifteen years following. For the most part, these residents will consist of two person families. Comparatively few permanent home families will have children.