


August 23, 2001

MEMORANDUM TO: William Reamer, Chief
High-Level Waste Branch
Division of Waste Management, NMSS

FROM: Melvyn Leach, Chief 
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

SUBJECT: TECHNICAL ASSISTANCE REQUEST - REVIEW OF GROUNDWATER
TEST RESULTS SUBMITTED BY VIRGINIA POWER CO. FOR ITS
CATEGORY I SERVICE WATER POND DAM AT NORTH ANNA

The FCSS Fuel Cycle Licensing Branch requests technical assistance in reviewing the following project:

Project: Dam Safety Inspection - North Anna Category I Service Water Pond Geochemistry

RITS/TAC No: 201112E/A10277

Requested Action: Reviewer shall determine if information submitted by Virginia Power Co. (VPC) is sufficient to determine if impounded water can be related chemically to water from piezometer P-22 and/or surface water from a wet area below the SWR dike. If licensee-provided information is insufficient, reviewer shall provide written recommendations for appropriate testing to make such determination. If the information provided is sufficient, then reviewer shall make a written opinion regarding any relationship of the water from the three sources.

Background: In 1997, 1999, and 2001, NRC has observed apparent seepage water below the SWR embankment. VPC has stated that the water is runoff, unrelated to seepage. On January 12, 1998, VPC took water samples from the SWR, piezometer P-22, and ponded water below the SWR dike. VPC ran conductivity tests and concluded that the water from P-22 and below the SWR dike did not originate from the reservoir. A technical review of the test results and conclusions is requested.

Please provide the information requested below and return a completed copy to the Licensing Assistant (LA) or Project Manager (PM).

Name of Reviewer: Bill Dam

DWM'S Projected Completion Date: _____

HLW Branch Chief Signature: _____

Mr. W. Reamer

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Contacts: PM: Daniel Rom (301) 415-6704
LA: Anne Ramirez (301) 415-6631

The above TAC No. should be referenced in future correspondence related to this request and on the RITS Report for recording staff time expended on this effort.

Attachment: 1. Virginia Power Company's Response #4 to NRC's 1997 Dam Safety Audit
(dated 1-28-98)
2. Dike and test location diagram

SHORT TERM ACTION FINDINGS (continued)

4. Virginia Power Corporate staff indicated that analysis of seepage water could determine whether seepage was from the SWR. Once the weirs are operational, water samples should be taken to see if the water source is in fact the SWR.

Action: Water samples were taken from three areas around the SWR on January 12, 1998 to measure conductivity. These included water from the service water reservoir, water from piezometer P-22 casing during bailing, and ponded water at the weir wall in the wet area below the SWR dike and adjacent roadway (Attachment 2, Figure 1).

Sample results are as follows:

Piezometer P-22	99 micromhos
Weir Wall	123 micromhos
Service Water Reservoir	922 micromhos

Conductivity is a measure of a solutions capacity to conduct electric current and depends on the presence of ions. The more dissolved salts/ions that are present in the solution the higher the conductivity that would be expected. The substantially higher conductivity values obtained from the SWR sample is due to the biocidal and other chemical treatment used in the reservoir.

These conductivity tests clearly indicate the water obtained from piezometer P-22 and the drainage area did not originate from the reservoir and therefore are not the result of seepage from the reservoir. As a comparison, the conductivity of distilled (de-ionized) water ranges from 0.05 to 2.0 micromhos.

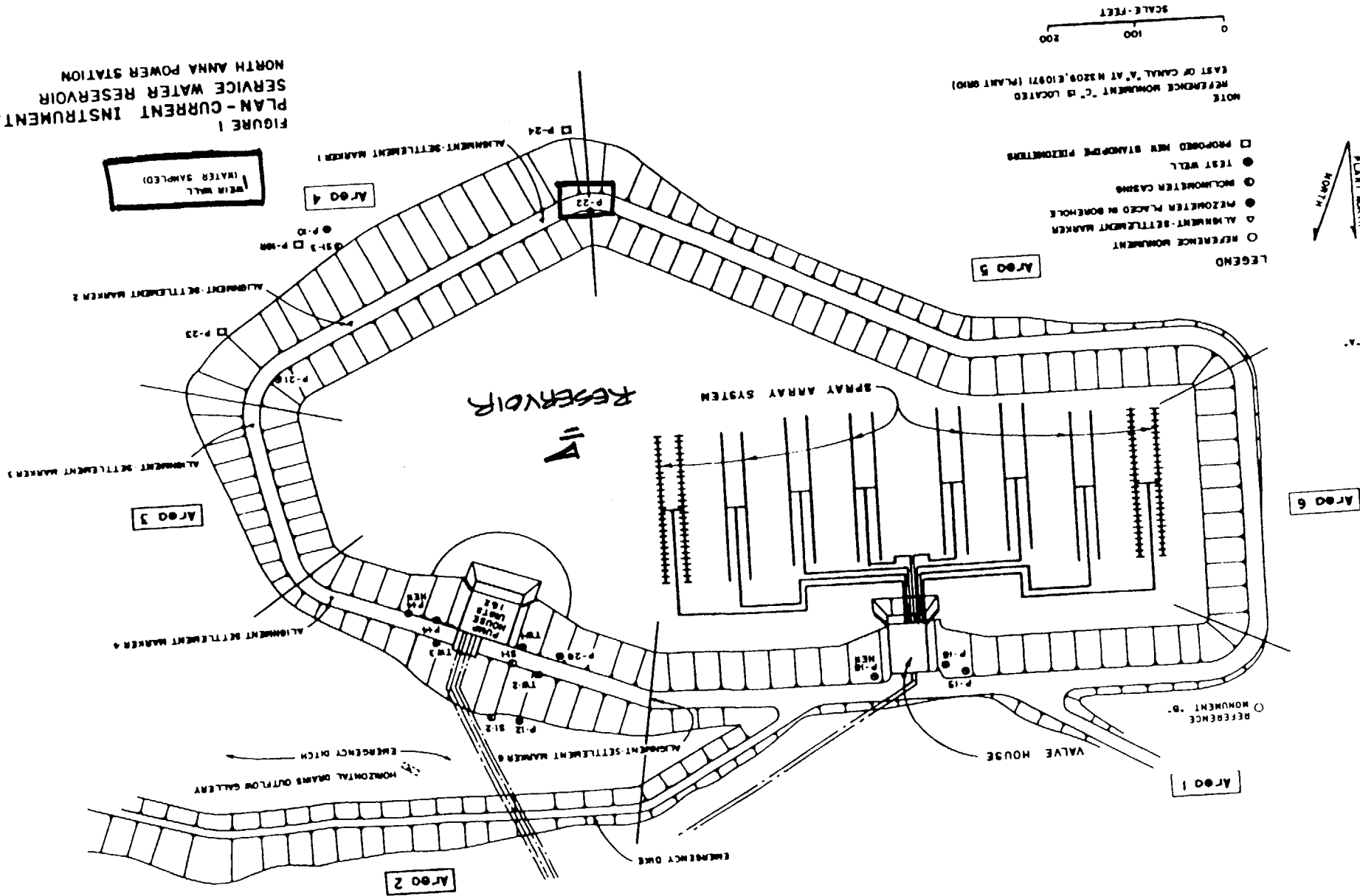
Due Date: Complete, no further actions required.

5. Reactivate weirs for flow measurements. Those that cannot be made functional should be removed and new weirs established.

Action: Results of the conductivity tests on a water sample taken from the weir wall which is located downstream or downgradient from the other weirs, clearly indicates that the water did not emanate from the reservoir. Therefore, reactivating weir flow measurements would only measure runoff and groundwater movement which would provide extraneous data not pertaining to SWR seepage or stability. In our opinion, such effort is unwarranted.

Due Date: No further actions required or planned at this time.

FIGURE 1
PLAN-CURRENT INSTRUMENTATION
SERVICE WATER RESERVOIR
NORTH ANNA POWER STATION



NOTE: REFERENCE MONUMENT "C" IS LOCATED EAST OF CAUL "A" AT N3209.810971 (PLANT GRID)

- LEGEND
- REFERENCE MONUMENT
 - △ ALIGNMENT SETTLEMENT MARKER
 - PIEZOMETER PLACED IN BOREHOLE
 - RECLOMETER CASING
 - TEST WELL
 - PROPOSED NEW STANDPIPE PIEZOMETERS



○ MONUMENT "A"

○ MONUMENT "B"

WEIR WALL (WATER SAMPLED)

Area 4

Area 5

Area 3

Area 6

Area 2

Area 1

RESERVOIR

SPRAY ARRAY SYSTEM

VALVE HOUSE

PUMP HOUSE

HORIZONTAL DRAWS OUTFLOW GALLERY

EMERGENCY DITCH

EMERGENCY DRAIN

ALIGNMENT SETTLEMENT MARKER 1

ALIGNMENT SETTLEMENT MARKER 2

ALIGNMENT SETTLEMENT MARKER 3

ALIGNMENT SETTLEMENT MARKER 4

ALIGNMENT SETTLEMENT MARKER 5

ALIGNMENT SETTLEMENT MARKER 6



SCALE - FEET
0 100 200

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