Summer

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Mr. Stuart A. Richards, Director
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Richards:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
GROUNDWATER PROTECTION – DATA COLLECTION QUESTIONNAIRE

The nuclear industry, in conjunction with the Nuclear Energy Institute, has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with the NRC. The completed questionnaire for V. C. Summer Nuclear Station is enclosed.

This submittal contains no new regulatory commitments.

Please contact Mr. Paul Mothena of my staff at (803) 345-4642 if you have questions about the enclosed information.

Very truly yours,

Jeffrey B. Archie

SBR/JBA/dr
Enclosure

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Industry Groundwater Protection Initiative Questionnaire

Plant: VC Summer Nuclear Station

1. **Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.**

- Liquid Radioactive Waste Effluent Monitoring and Detection - The primary discharge point for liquid radioactive waste after processing is the Fairfield Pumped Storage penstocks. The liquid effluent discharge is routed through a buried double wall pipe that passes through manholes containing leak collection pots and level switches. Automatic discharge valves are located at each penstock with their own individual containment structures to collect any potential leakage.

  If an increase in level is detected in the collection pots, an annunciator is actuated to notify plant personnel of a potential leak. The affected level switch pot(s) is then drained and tested for radioactivity to determine if additional action is necessary. In accordance with established preventive maintenance procedures, each manhole is inspected monthly and each discharge valve containment structure is inspected quarterly for potential leakage. Any identified leakage is collected, tested and processed in accordance with plant procedures.

- Spent Fuel Pool Leakage Monitoring and Detection - There are nine monitor points for leakage from the Spent Fuel Pool liner. These "tell tales" drains are monitored quarterly in accordance with plant surveillance procedures.

- Steam Generator Blowdown to the Circulating Water System - An alternate path is provided for steam generator blowdown to the Monticello Reservoir via the return piping for the Circulating Water System. In the event high radioactivity is detected, a radiation monitor will terminate this discharge. This release path is not a direct communication to groundwater.

- Refueling Water Storage Tank (RWST) Pit Collection and Monitoring - Rainwater and/or any leakage which would collect in the RWST Pit is collected and pumped into the RWST Pit Drain Tank. The liquid is sampled and either released or processed as radwaste. The RWST Pit Drain Tank is located in a curbed area where any leakage from it would be contained and drained back to the RWST pit sump for processing.

- Condensate Storage Tank (CST) and Piping - The CST is located within the plant's Protected Area and is monitored by operations personnel each 12 hour shift for any abnormalities and leaks. Additionally, the tank level is recorded using two CST level instruments each 12 hour shift.

  The Emergency Feedwater and Condensate System Engineers also perform periodic walkdowns of the CST area to look for any abnormalities, including leaks. A sample is collected daily of the outfalls from yard storm drains and monitored monthly per the Radiological Environmental Monitoring Program (REMP).

- Turbine Building Sump Discharge - Non-radioactive wastes from the Turbine Building, Intermediate Building and Tendon Access area are collected in the Turbine Building Sump. A liquid radiation monitor is provided to automatically terminate discharge from this sump if its setpoint is reached. A continuous composite sample is collected and analyzed weekly and tracked in the Radioactive Effluent Tracking System. Wastes from this sump are sent to an outside collecting sump and then forwarded to the Plant Waste Surge Basin for eventual discharge. Monitoring of leakage from the Plant Waste Surge Basin is performed in accordance with the REMP.

- Condensate Polisher Backwash and Disposal - During plant startup and up to 50% reactor power, a condensate polisher is used to remove ionic and particulate impurities from the condensate. The condensate polisher resin is removed by backwashing after it is exhausted. This resin slurry is collected in a tank and after sampling for radioactivity is normally pumped to the Alum Sludge Lagoon where the resin settles out and the liquid is discharged. If radioactivity is present, the resin slurry is sent to a high integrity container where it is dewatered and the resin disposed of as radioactive waste. During transfer of the resin slurry to the Alum Sludge Lagoon, a radiation monitor continuously monitors the slurry and will terminate the transfer if its setpoint is reached. Monitoring for leakage from the Alum Sludge Lagoon is performed in accordance with the REMP.

2. **Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.**

   VCSNS has three (3) onsite groundwater monitoring wells included in the REMP. These wells are:

- Two (2) onsite wells within 200 yards of the plant as required by the Offsite Dose Calculation Manual (ODCM).

- One (1) onsite well located near the site boundary in the quadrant of our Maximum Exposed Individual.

These wells are sampled quarterly and analyzed for radionuclides (including tritium).

In addition, VCSNS samples the local municipal drinking water system monthly.

VCSNS has 16 additional onsite wells which are not currently included in the REMP. These wells are:

- Five (5) onsite wells used for monitoring near the Waste Treatment Ponds.
- Eleven (11) additional onsite wells installed for groundwater remediation.

These wells are sampled semiannually and analyzed for radionuclides (including tritium).

Listed in the table below are the nuclides required by the ODCM to be monitored and the respective counting sensitivity, along with the highest minimum detectable activity (MDA) reported in 2005.

Nuclide	ODCM required LLD (pCi/l)	Max MDA reported in 2005 (pCi/l)
H-3	2000	566.00
Mn-54	15	3.49
Co-58	15	3.67
Fe-59	30	6.90
Co-60	15	3.93
Zn-65	30	7.86
Zr-95	30	4.69
Nb-95	15	6.29
Cs-134	15	3.52
Cs-137	18	3.50
Ba-140	60	15.30
La-140	15	6.47

3. **If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).**

- 02/02/87- An inadvertent activation of the Fire Service System caused the flooding of the Fuel Handling Building charcoal plenum with a subsequent release to the RCA yard and storm drains. (Reference: ONO 87-009)

- 08/05/92 - Activity was identified in and around a liquid radwaste discharge line leak detection manhole. (Reference: Radiological Incident Report 92-32)

- 05/22/95 - Present - Tritium below the USEPA maximum concentration level has been detected in four (4) of the five (5) NPDES monitoring wells around the Waste Treatment Ponds. The highest level detected was 12,700 pCi/l identified in November of 1996. Since February 2000 only one well has identified tritium levels above MDA. Four (4) of the thirteen (13) samples taken from that well have identified tritium in the range of 891 to 1830 pCi/l. (Reference: CER 06-0032, CER 06-1912)

4. **If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the USEPA for drinking water.**

- There have been no identified instances of radioactivity released from the VCSNS that resulted in groundwater concentrations exceeding the USEPA maximum contaminant levels for drinking water.

5. **Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.**

- 10/28/85 - A hose used for S/G sludge lancing leaked approximately four (4) gallons of contaminated water on the ground outside the RCA. The contaminated soil was removed and disposed of as radwaste. (Reference Health Physics Problem Report 85-48)

- 06/20/94 – A liner containing spent condensate resin was punctured causing a fifteen (15) gallon spill outside the protected area. The contaminated soil was removed and disposed of as radwaste. (Reference Radiological Deficiency Report 94-027-D)