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

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Groundwater Protection – Data Collection Questionnaire

Dear Mr. Richards:

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 NRC. The completed questionnaire for Byron Station is enclosed.

This submittal contains no new regulatory commitments.

Please contact me at (815) 406-3600 if you have questions about the enclosed information.

Sincerely,



David M. Hoots
Site Vice President
Byron Nuclear Generating Station

Enclosure

c: B. Bartlett, USNRC Senior Resident Inspector, Byron
Ralph Andersen, Nuclear Energy Institute
Manager, Licensing - Braidwood, Byron & LaSalle

**Industry Groundwater Protection Initiative
Voluntary Data Collection Questionnaire**

Plant: Byron Nuclear Generating 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.

- A review was performed on each plant system at Byron Nuclear Generating Station to evaluate their potential for releasing contamination to the environment. The review was performed by the Engineering System Managers for each plant system. Those plant systems that screened out as having the potential to introduce contamination to the environment were collegially reviewed and scored against a developed set of criteria. The collegial review was performed by station experts from Plant Operations, Radiation Protection, Engineering, Chemistry and Project Management. If a plant system's score exceeded a pre-determined amount, the review team worked with others at the station to identify actions that could be taken to mitigate the contamination risks.
- Byron Nuclear Generating Station has an operating Spent Fuel Leakage detection system that is used to monitor for leakage from the spent fuel pool.
- Engineers perform periodic walkdowns of the systems for which they are responsible. These rounds include reporting of identified spills and leaks. Spills and leaks are addressed through: immediate clean-up, notifying supervision for immediate assistance, writing a work request or initiating an Issue Report (Corrective Action Program).
- Operations personnel perform routine surveillance rounds shiftily. These rounds include reporting of identified spills and leaks. Spills and leaks are addressed through: immediate clean-up, notifying supervision for immediate assistance, writing a work request or initiating an Issue Report (Corrective Action Program). Also, Operations perform periodic leakage inspections of the Circulating Water Blowdown line.
- Outfalls that have the potential to affect dose to the public are identified in the Station's Offsite Dose Calculation Manual (ODCM). These outfalls identified in the ODCM and have the potential to release radioactivity to groundwater are monitored by inline radiation monitors (gamma detection) and compositors (tritium analysis). The primary release pathway the Circulating Water Blowdown (CWBD) line also has leakage monitors installed inside the relief valves (vacuum breakers) vaults of the CWBD line.
- The Radiological Environmental Monitoring Program (REMP) provides representative measurements of radiation and radioactive material in the environment. Six REMP monitoring wells have been established as part of this program to verify measurable radiological impacts from the power station on the environment are within expectations derived from the effluent measurements and calculations in the ODCM.
- Additionally, monitoring wells as described in question 2 provide a mechanism to identify active leaks.

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

- Byron Nuclear Generating Station has 31 monitoring wells on the owners property. Of these, 3 are in the plant protected area to monitor the reactor water

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storage tanks, circulating water flume, condenser pipe lines, the essential service water cooling tower basin, condensate polishing system, containment building sumps, waste water treatment system, and rad waste liquid system. In addition, there are 22 monitoring wells along the length of the circulating water make-up and blowdown lines to the Rock River. Of the 31 wells previously mentioned, the plan is to remove 12 shallow wells that are not in ground water.

- Byron Nuclear Generating Station implemented quarterly sampling of monitoring wells and wells in the PA for contamination. The plan uses Tritium as the analyte of interest for radionuclide detection. If tritium is detected, the station would test well samples for gamma and other beta radionuclides. Reporting the presence of a radiological release to the appropriate agencies would be performed in accordance with state and federal regulations.

The corporation is in the process of developing a fleetwide program to further identify actions to be taken and develop a standardized groundwater-monitoring program.

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).

- In April, 1986, the circulating water blowdown line developed leaks on three separate occasions. Response to all three leaks were to terminate all releases via this pathway until repairs were completed. After the third leak, the fiberglass line was replaced with a steel pipe.
- In 2000, the Unit 1 Containment Access Facility was found to have leaching from the contaminated area to the ground.
- The Treated Runoff ponds and the Sewage Treatment drying beds have had isotopically contaminated liquids present that may have leached into the concrete liner.
- In March 2006, tritium was identified in several of the six (6) vacuum breaker vaults along the Circulating Water Blowdown line. This water was available to be transported to the environment via migration of water in the vaults, through the drains to the groundwater.

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.

Response:

- Byron Station has not experienced any instances where either on-site or off-site monitoring well sample results indicated tritium levels in excess of the USEPA established limits.
- In March 2006, off-site wells (still within company property) indicated three locations where tritium concentration exceeded background detectable limits (200 pCi/l). The actual concentrations were a fraction (ranging from 350 to 3700 pCi/l) of the federal drinking water and were identified in only three of the off property wells.

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- 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.**

Response:

- Based on there being no circumstances where either on-site or off-site monitoring well sample results being in excess of USEPA drinking water limits, there have been no previous or planned remediation efforts.
- A remediation plan is not required for the March 2006 identification of tritium levels above background levels. Reviews of sample results and hydrology of the impacted area indicate that tritium concentrations above background levels will not be detected off of company property.