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Braidwood Station  
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July 28, 2006  
BW060073

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

Braidwood Station, Units 1 and 2  
Facility Operating License Nos. NPF-72 and NPF-77  
NRC Docket Nos. 50-456 and 50-457

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 the NRC. The completed questionnaire for Braidwood Station is enclosed.

This submittal contains no new regulatory commitments.

Please contact Mr. Dale Ambler, Regulatory Assurance Manager, at (815) 417-2800 if you have questions regarding the enclosed information.

Respectfully,



Keith J. Polson  
Site Vice President  
Braidwood Nuclear Generating Station

MC/vk  
Enclosure

cc:      J. Caldwell, US NRC Regional Administrator – Region III  
         S. Ray, US NRC Resident Inspector  
         G. Roach, US, NRC Resident Inspector  
         Ralph Andersen, Nuclear Energy Institute

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

**Plant:** Braidwood 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.**

- As part of a fleet-wide systematic assessment, Braidwood Station performed a technical review of each plant system and structure to determine if inadvertent releases from these systems could potentially impact the environment. Each system was evaluated and those system components that contain or could potentially contain radioactively contaminated liquids were identified and assessed to determine if a potential pathway to the environment existed. A cross-functional collegial team made up of personnel from Operations, Engineering, Chemistry, and Radiation Protection performed the technical review.
- The plant systems, structures, processes, and components that have a potential for an inadvertent release are routinely monitored to detect leakage or spills through an expansive radiation monitoring system (RMS), operator rounds and employee observations. Additionally, engineering control systems such as secondary containment, spill prevention, overflow detection and leak detection are used to detect and prevent releases from entering the environment.
- Examples of the surveillance programs and engineering controls employed at Braidwood are provided below:
  - The Circulating Water Blow Down (CWBD) line has leak detectors installed inside vaults for each Vacuum Breaker (VB) valve. The Vacuum Breakers serve to protect the CWBD line piping integrity and each vault is sealed from the environment. Automatic alarm features notify the control room if leakage is detected in the VB vaults.
  - The site oil/water separator and plant ditches are manually sampled on a routine frequency.
  - The Operations Department performs periodic leakage surveillances for the CWBD line, the FRAC Tanks, and temporary berms. In addition, inspections of FRAC Tank transfer hoses and wastewater processing equipment are performed on a shiftly basis.
  - The System Engineering Department performs preventive maintenance surveillances on tanks and underground piping. The preventative maintenance program covers the frequency of these inspections.
  - Plant water usage is trended via Radwaste Processing and any adverse trend is addressed immediately as this water is currently being recycled.
- All inadvertent releases are captured in the Corrective Action Program (CAP).

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

- Twenty-one monitoring wells have been installed to monitor for tritium in the groundwater, in the immediate vicinity of the station. These monitoring wells are part of the REMP program and part of a separate ground water monitoring program.
- Per the REMP Program residential wells are included and sampled quarterly.
- From November 2005 through June 2006, over 200 temporary monitoring wells were installed to further characterize onsite and offsite groundwater.
- The Lower Limits of Detection (LLDs) used during the fleet wide assessment were:

Nuclide	Typical MDA (pCi/l)
Tritium (H-3)	200
Total Strontium – 89/90	2
Manganese (MN-54)	15
Ferrous Citrate (FE-59)	30
Cobalt (CO-58)	15
Cobalt (CO-60)	15
Zinc (ZN-65)	30
Zirconium (ZR-95)	30
Niobium (NB-95)	15
Cesium (CS-134)	15
Cesium (CS-137)	18
Barium (BA-140)	60
Lanthanum (LA-140)	15

**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).**

- The Braidwood Station records inadvertent release of radioactive liquids in accordance with 10 CFR 50.75(g). As part of the fleet wide assessment, a third party environmental engineering firm was contracted to evaluate historic releases, if any, and determine if a potential pathway to the environment existed. Those releases that were determined to have potentially impacted groundwater were subsequently investigated as part of the fleet wide assessment. Based on the results of the hydrogeologic investigation, the historical releases that may have a current impact on groundwater are:
  - A heating system relief valve discharged to the Oil/Water Separator in December 1990
  - A leak from Circulating Water Vacuum Breaker Valve OCW060 in November 1998
  - A leak from Circulating Water Vacuum Breaker Valve CW0557/58 Vault in November 2000

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- A leak from Circulating Water Vacuum Breaker Valve OCW138 in August 2003
  - Steam release from the west side of the Turbine Building in April 2006
  - A copy of the detailed Braidwood hydrogeologic investigation report will be provided to the NRC.
- 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.**
- In 1996, 1998 and 2000, leaks from the Circulating Water Blow Down (CWBD) Vacuum Breakers resulted in localized groundwater tritium concentrations exceeding the USEPA limits for drinking water.
  - These areas have been thoroughly characterized in detailed reports provided to the Illinois Environmental Protection Agency.
- 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.**
- An Illinois Environmental Protection Agency approved remediation action plan has been implemented to remediate the tritium in the groundwater. A copy of the remediation action plan is posted on the NRC website.