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Three Mile Island Unit 1  
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An Exelon Company

5928-06-20493

July 31, 2006

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

**SUBJECT:** Groundwater Protection – Data Collection Questionnaire

**DOCKET NO:** 50-289

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 TMI Unit 1 is enclosed.

This submittal contains no new regulatory commitments.

Please contact Chris Baker, TMI-1 Chemistry Manager, at 717-948-8983 if you have questions about the enclosed information.

Sincerely,



Russell G. West  
Vice President TMI, Unit 1

Enclosure

c: USNRC Document Control Desk  
USNRC Regional Administrator – Region 1  
NRR Project Manager – TMI Unit 1  
USNRC Resident Inspector – TMI Unit 1  
Ralph Andersen, Nuclear Energy Institute  
Director PA BRP

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

**Plant: Three Mile Island 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.**

- As part of a fleet-wide systematic assessment, Three Mile Island 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 or 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 Three Mile Island are provided below:
  - Three Mile Island has a Fuel Pool Leakage detection system, which would indicate any leakage from its fuel pool.
  - The site storm drain system is routed to the East Dike holding pond prior to discharge to the river. This holding pond is sampled and analyzed prior to discharge.
  - Operations personnel perform routine surveillance rounds each shift. These rounds include the requirement to identify and report leaks and spills. Leaks and spills are addressed through: immediate clean-up, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - System Engineers perform periodic walkdowns of the systems for which they are responsible. These rounds include the requirement to identify and report leaks and spills. Leaks and spills are addressed through: immediate clean-up, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.

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

- The Three Mile Island groundwater monitoring system was comprised of 27 active monitoring wells sampled quarterly to detect low level of plant related radioactivity. As part of the fleet wide assessment, 32 new monitoring wells were installed and sampled.

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- 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)       | 15                  |
| 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).**

- Three Mile Island Unit 1 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:
  - Leaks from the Unit 2 Borated Water Storage Tank occurred between 1981 - 1987.
  - 1990 - Secondary Side water drained to roof from the Feed Water Heaters.
  - 1986/1996/1997 - Unit 1 Borated Water Storage Tank leaks.
  - 1999 - Unit 1 Liquid radwaste discharge line leakage.
  - 1995/2004 - Unit 1 Aux Boiler Blowdown sump leakage.
  - 2006 - Unit 1 Condensate Storage Tank - A, de-icing line leak.
- A copy of the detailed Three Mile Island Unit 1 hydrogeologic investigation report will be provided to the NRC.

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**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 Three Mile Island 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.**

- Following the installation of the new wells in May 2006 all new and existing wells were sampled for tritium, strontium-89/90 and gamma-emitting radionuclides. No gamma emitting or Sr-89/90 was detected in any of the well or surface water samples collected. The site maintains three production supply wells that are pumped continuously for supply water to various systems. The benefit of this is that the station recovers tritiated water beneath the site for use at the station.