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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 8, 1980

INFORMATION REPORT

SECY-80-181

For: The Commissioners
Thru: Executive Director for Operations *WRC for W. J. D.*
From: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Subject: TRITIUM CONCENTRATIONS IN GROUNDWATER MONITORING WELLS AROUND
THE THREE MILE ISLAND UNIT 2 REACTOR CONTAINMENT BUILDING

Purpose: To inform the Commission of measured tritium concentrations above
background levels in the groundwater monitoring wells around the
TMI-2 reactor containment building.

Discussion: At the request of the NRC staff in July 1979, the licensee, Metro-
politan Edison Company, agreed to install groundwater monitoring
wells around the TMI-2 reactor containment building. The purpose
of the wells was to provide early detection of radioactivity in
the groundwater adjacent to the TMI-2 reactor containment building
due to the unlikely event of leakage of highly contaminated sump
water from the building. The licensee planned for the installation
of eight monitoring wells at various locations around the TMI-2 re-
actor containment and adjacent buildings. Enclosure 1 depicts the
locations of these wells. The first wells (monitoring wells 4 and
7) were completed in late January of this year and groundwater
samples were drawn for analysis of tritium concentrations. The
remaining wells were completed in February and March and corres-
ponding groundwater samples were drawn following well completion.
With the exception of well MW-2 (2500 pCi/l), the concentrations
were in the 100-600 pCi/l range. Although a firm background con-
centration for tritium in the groundwater has not yet been estab-
lished, the staff estimates that it is probably in the range of
200 pCi/l to 300 pCi/l. Thus, the highest measured groundwater
tritium concentration to date is approximately 8 to 12 times expected
background levels. It should be noted that a tritium concentration
of 2500 pCi/l is approximately 1000 times less than the maximum
permissible concentration (MPC) of tritium in unrestricted area
water (see 10 CFR Part 20, Appendix B, Table II, Column 2).

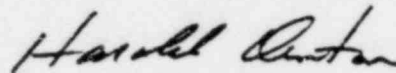
The location of the well (MW-2) indicating the highest tritium
concentration is adjacent to the Unit 2 borated water storage tank
(BWST). The staff has learned that the tank has been a source of
minor leakage (i.e., there has been no observable change in tank
level) to the surrounding ground and that at least some of the
water in the tank originated in Unit 1. Thus, the Unit 2 BWST

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remains a likely, but unsubstantiated, source of groundwater contamination.

Additionally, the color (dark brown) of fluid pumped from wells MW-3 and MW-8 is inconsistent with that obtained from other wells on site. There is no apparent relationship between the color change and tritium concentration. While still unsubstantiated, the discoloration does not appear to be associated with biological contaminants.

Based on the preliminary results of the groundwater monitoring program, the staff has initiated an intensive program to locate the source of the apparent radioactivity and further quantify the physical characteristics, levels, and magnitude of the contamination. The staff has outlined a list of action items to be initiated by the licensee no later than Monday, April 7. The staff's formal request, including the list of action items, is contained in Enclosure 2. As additional information is obtained and evaluated, the staff will inform the Commission of its findings.



Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:

1. Plot plan of TMI-2 containment groundwater monitoring wells
2. Memorandum fm. B. Snyder to J. Collins dtd 4/3/80, action request to evaluate groundwater conditions at TMI

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 3, 1980

MEMORANDUM FOR: John T. Collins, Deputy Program Manager
TMI Program Office, NRR

FROM: Bernard J. Snyder, Program Manager
TMI Program Office, NRR

SUBJECT: ACTIONS REQUESTED TO EVALUATE GROUND WATER CONDITIONS AT TMI

As discussed last night and today with you, we have reviewed the currently available data obtained from the wells at the site. As a result of the somewhat higher than expected readings of tritium in the ground water samples, I am requesting that you have Met Ed take, as a minimum, the actions as listed in the attachment. It is requested that Met Ed be asked to proceed immediately to get these actions underway with the actual work to start as soon as possible, but no later than Monday morning, April 7. Harold Denton has reviewed the requested actions and concurs in this approach. I understand that you will be issuing today a PN on this matter.

A handwritten signature in cursive script, appearing to read "B. J. Snyder".

Bernard J. Snyder, Program Manager
TMI Program Office
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc: Harold R. Denton
Richard H. Vollmer
Joseph J. Fouchard

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REQUESTS FOR ACTION PLAN TO
EVALUATE GROUNDWATER CONDITIONS AT TMI

1. Take soil and groundwater samples from holes at a minimum of 4 locations using an auger, and located as close to the reactor building as physically possible (closer than MW-2, MW-3, or MW-8). In addition, take soil and groundwater samples in the vicinity of the leaking BWST and near the auxiliary building. Shelby tube samples should be used below groundwater level.
2. Run tritium and isotopic gamma scans on all samples.
3. Provide concentrations, activities, and history of concentrations of BWST which is located near MW-2.
4. Provide nuclide data from the sampling programs that were performed at MW-1 and at the monitoring well located near the interim solid waste storage area.
5. Provide the results of recent sampling of Susquehanna River water with regard to tritium and gamma scans.
6. Provide the containment water level history.
7. Provide groundwater elevations from recent monitor well tests and from other available information.
8. Provide recent tritium and gamma scan analyses of recent samples taken from MW-8.
9. Provide detailed evaluations and conclusions regarding the source of leakage, particularly the possibility of leakage from the containment and auxiliary buildings after the accident which may have resulted in nuclide migration away from the building. Include the location of piping and possible pipe leaks in your analysis.
10. Maintain ongoing records and analyses of the well monitoring program and related monitoring programs.
11. Determine constituents of brown water samples from MW-3 and MW-8