



Department of Energy

Incoming: 9306337

Richland Operations Office
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OCT 5 1993

93-LWB-128



Ms. Dru Butler, Program Manager
Nuclear and Mixed Waste Management
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Butler:

TRITIUM CONCENTRATIONS IN THE EFFLUENT FROM THE 200 AREA EFFLUENT TREATMENT FACILITY (PROJECT C-018H)

The purpose of this letter is to provide the Washington State Department of Ecology (Ecology) with a clarification regarding the expected tritium levels in the ETF effluent. Over the past several months, the amount of tritium that will be disposed to the soil from the 200 Area Effluent Treatment Facility (ETF) has become an area of confusion and concern for your staff. Confusion over this issue is a result of several of the Department of Energy reports submitted to Ecology containing different tritium concentrations, depending on the time the report was prepared and/or the purpose of the report.

The ETF is designed to treat 242-A Evaporator process condensate, plutonium uranium extraction (PUREX) process distillate discharge and PUREX ammonia scrubber distillate. However, in January 1993, the DOE announced the PUREX Plant would be closed and prepared for decontamination and decommissioning. As a result, there is no intention to treat the two PUREX Plant effluents in the ETF.

With the elimination of the PUREX Plant effluents from the ETF design basis, the amount of tritium to be released from the ETF is significantly reduced. Most of the reports transmitted to Ecology contain the average PUREX Plant tritium concentration of 60,000,000 picocuries per liter (pCi/l). With the elimination of the PUREX Plant effluents from the scope of the ETF, the tritium releases should now be based upon the data for the 242-A Evaporator process condensate.

The waste that is available for processing through the 242-A Evaporator is currently stored in the Double-Shell Tank (DST) System. Operations at Hanford Facility no longer produce tritium.

The concentration of tritium varies from DST to DST. As a result, the feed to the ETF will be variable and will depend on the tritium content of the DST that was the source of the 242-A Evaporator process condensate. There is no known, feasible method of removing tritium from the ETF effluent, therefore



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all the tritium in the feed to the ETF will pass through the facility and be disposed of to the soil column.

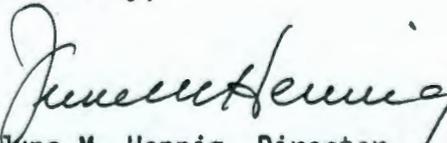
Data from 83 samples of the 242-A Evaporator process condensate taken between 1977 and 1988, indicate that tritium levels in the process condensate averaged 5,600,000 pCi/l with a maximum of 24,000,000 Pci/l. The 90 percent confidence interval value of 6,300,000 pCi/l was used as the design basis for the ETF.

The 242-A Evaporator is projected to operate through the year 2015. During this period it is estimated that 526 million liters of process condensate will be produced. Using the 90 percent confidence interval as a conservative (high) estimate of the tritium concentration there will be an estimated 3300 Ci of tritium discharged from the ETF. This estimate does not account for the decay (half-life 12.3 years) of the tritium. The contribution of tritium from sources other than the DSTs, such as clean-out of old facilities, is anticipated to have a negligible impact upon the total amount of tritium released from the ETF.

In conclusion, the amount of tritium in the effluent from the ETF will vary with time, but the total tritium disposed of is not anticipated to exceed 3,300 curies. If radioactive decay is factored into the tritium inventory values, the 3,300 Curies of tritium will have decayed to approximately 960 curies by the year 2015. Most, if not all, of the reports submitted to Ecology have been based on much higher tritium levels. As a result, these reports should present a very conservative (high) estimate of the tritium releases from the ETF.

Should you have any questions, please contact Mr. D. C. Bryson on (509) 372-0738.

Sincerely,


June M. Hennig, Director
Waste Management Division

LWB:DCB

cc:

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