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memorandum

TO: Steve Hanson, CST-13, MS E518
Steve Rao, ESH-18, MS K497

DATE: February 3, 1995

FROM: Robin Reynolds, CST-13/ESH-18

MAIL STOP/TELEPHONE: K497/7-4689

SUBJECT: ESH-18/WQ&H-95-0055

ACCELERATOR PRODUCED TRITIUM SURVEY FOR THE TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

In accordance with your request, I have completed a review of all tritium liquid waste producers identified in the recent Merrick Radioactive Liquid Waste Collection System Study Questionnaire. This study was completed for all operations discharging to the TA-50 Treatment Facility. Attached is a summary of my review.

According to the Merrick Study and verified by myself, a total of 11 of 13 source points of tritium were found to be reactor produced. The two remaining source points are possibly accelerator produced. In my conversation with Richard Carlson, Group Leader for ESA-3, he indicated to me that a member of his group is currently conducting an experiment which measures the amount of tritium gas produced from a specific experimental section of the LAMPF beam operation. These tritium measurements are currently being conducted at TA-21 to demonstrate the production of tritium from an accelerator in support of a National Defense Program initiative. The experiment will demonstrate the capabilities of the proposed Accelerator Produced Tritium (APT) Project to be initiated at the TA-53 LAMP Facility some time in the future.

During the running of past experiments, the Room 137 activity in question has generated liquid waste at the rate of 3-5 gallons per experiment. Approximately 8 of these experiments were conducted between October 1, 1993 October 31, 1994. Also the liquid waste generated from the cleaning of contaminated glassware and hand washing could potentially be contaminated with accelerator produced tritium. This practice could have possibly introduced very minute levels of tritium to the TA-21-257 Treatment Facility which in turn discharges to the TA-50 Treatment Facility. I have made arrangements for any new liquid waste produced from this experiment to be transported to the TA-53 Radioactive Lagoon for disposal by evaporation. I am also working on initiating administrative requirements along the lines of posting signs at each of these locations. These signs will prohibit the discharge of any accelerator produced tritium for any and all drains to the TA-50 Treatment Facility.

Therefore, based upon my review and to the best of my knowledge, all tritium discharges currently entering the TA-50 Treatment Facility have been determined to be reactor produced. Please advise if further information would be helpful.



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ATTACHMENT 1
**Review of Merrick Radioactive
Liquid Waste Collection
System (RLWCS) Study:
Radioactive Isotope Survey Section
February 3, 1995**

1. **Name of Source:** Solid Waste Disposal Facility **Building:** TA-54-11-00
Name of Owner: Steve Francis **Group:** CST-7
Phone: 667-6095 **Number of Sources:** 1
Description: Solid tritium sources and contaminated solid wastes from various Laboratory facilities are disposed of at this facility. Solid waste is disposed of in accordance with low, medium, and high level requirements. Low level waste is disposed of in the tritium waste disposal pit. Once in the pit and covered, there is little chance that material will come in contact with rain or storm water runoff. Medium and high level waste are disposed of in un-lined and lined shafts respectively. The construction of these shafts and associated access lids with security covers prohibit any contact with rain water. Although there is no rain water collected from any of these disposal locations, additional administrative requirements should be immediately incorporated in the WAC that would control the disposal of any accelerator produced tritium liquid waste generated from the interim storage and /or disposal of these materials.

As far as internal controls are concerned, the waste acceptance criteria in place for the Solid Waste Disposal Facility mandates that no waste will be accepted for disposal or storage which contains free liquids. Also, the Disposal Facility located at TA-54 is not physically connected to the TA-50 Waste Treatment Facility's RLWCS and therefore could not discharge any amount of uncontrolled liquid waste into the collection system. Occasional rainwater is collected from transportainers and other waste container packages stored throughout this facility. The rain water is collected, sampled and is hauled under the waste profile and batch waste acceptance criteria for the TA-50 Treatment Facility

Disposal Practice: N/A.

2. **Name of Source:** Health Physics Analysis Lab **Building:** TA-55-02-PF4
Name of Owner: David Barnes **Group:** ESH-4
Phone: 667-3049 **Number of Sources:** 1
Description: A big part of the work load for this Lab is to analyze area radiological survey swipes and nose swipes via use of "Fluor" liquid scintillation cocktail media and associated counting equipment. Liquid wastes and cocktail solutions which are generated from the analysis process are sent back to the requester for disposal.

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During our phone conversation, David Barnes indicated to me that there are no accelerator produced tritium contaminated liquid wastes generated from this operation. This was also verified in a conversation between Steve Rae and Bob Martin. Dave also mentioned that pre treatment operational requirements in place at TA-55, PF-4 prohibit the discarding of contaminated scintillation cocktail solutions into the industrial RLWCS leaving TA-55 in route to the TA-50 Treatment Facility
Disposal Practice: All discharges of liquid waste from this facility currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.

3. **Name of Source:** Analytical Laboratory **Building:** TA-21-209-00
Name of Owner: Kandy Frame **Group:** ESA-3
Phone: 665-2386 **Number of Sources:** 1

Description: Currently, experiments run in this room which generate liquid waste are utilizing a reactor produced tritium source regulated under the Atomic Energy Act for work associated with the Nuclear Defense Program initiative. Currently, as far as Kandy Frame knows, there are no plans for the experiments in this room to use sources other than those that are reactor produced.

Disposal Practice: All discharges of liquid waste from this facility currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria

4. **Name of Source:** Analytical Laboratory **Building:** TA-21-155-209
Name of Owner: Richard V. Carlson **Group:** ESA-3
Phone: 665-2386 **Number of Sources:** 1

Description: In my conversation with Richard Carlson, he indicated to me that Dave Christiansen of ESA-3, TA-21, Room 137, is currently conducting an experiment which measures the amount of tritium gas produced from a specific experimental section of the LAMP Facility beam operation. These tritium measurements are being conducted to demonstrate the production of tritium from an accelerator in support of a National Defense Program initiative. The experiment will demonstrate the capabilities of the proposed APT Project to be initiated at the TA-53 LAMP Facility some time in the future. The experiment in question has generated liquid waste at the rate of 3-5 gallons per experiment. I have discovered some evidence that the cleaning of contaminated glassware and hand washing has occurred during the running of past experiments. This practice could have possibly introduced very minute levels of accelerator produced tritium to the TA-21-257 Treatment Facility. I have made arrangements for any additional liquid waste produced from their use to be hauled to the TA-53 Radioactive Lagoon for disposal by evaporation. I am also working on initiating administrative requirements along the lines of posting signs at each of these locations. These signs will prohibit the discharge of accelerator produced tritium for any and all drains to the TA-50 Treatment Facility.

Disposal Practice: All discharges of liquid waste from this facility currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.

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5. **Name of Source:** Van de Graph Facility **Building:** TA-03-16-45
Name of Owner: Gregg Chaparro **Group:** P-15
Phone: 667-5211 **Number of Sources:** 1
Description: Currently there are no experiments run in this room or at this facility which would utilize or generate accelerator produced tritium. All experiments that have generated liquid waste in the past were utilizing a reactor produced (AEA) tritium source from the Savannah River Project. The source has since been relinquished to the new Tritium Facility (WETF) located at TA-16, Building 205. The only remaining tritium at the facility is in the form of contact contamination in vacuum tubes and associated lines.
Disposal Practice: All discharges of liquid waste from this facility currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.
6. **Name of Source:** New Tritium Facility **Building:** TA-16-248 & 205
Name of Owner: Jay R. Carnes **Group:** ESA-5
Phone: 665-1228 **Number of Sources:** 2
Description: Building 248: Experiments run in this building generate little if any liquid waste and are utilizing a reactor produced tritium source from the Savannah River Project. All liquid waste generated from this room are placed in a holding tank located outside of Building 205.
Building 205: Experiments run in this building which generate liquid waste are utilizing a reactor produced tritium source from the Savannah River Project. All liquid waste generated from this building flow to the holding tank located outside where it is sampled and pre-characterized to meet the TA-50 waste acceptance criteria of <30,000 pCi/L. After preliminary review and approval by CST-13 officials, the batch liquid waste is pumped to a tanker truck and transported to the TA-50 Treatment Facility if tritium is not detected or levels are below administrative controls. The TA-53 Radioactive Lagoon could be used for disposal in the event that tritium levels were above those set forth in the TA-50 WAC but this practice has yet to be established.
Disposal Practice: All discharges of liquid waste from these two buildings currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.
7. **Name of Source:** TA-48 **Building:** TA-48-many rooms
Name of Owner: Miles Corrie **Group:** CST-CFM
Phone: 665-3465 **Number of Sources:** 5
Description: Tritium waste generation from this facility originate from the following rooms:
Room 19A: Laboratory
Room 208: Count Room
Room 210: Count Room
Room 308: Laboratory
Room 312: Laboratory

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Liquid waste generated throughout these various rooms are from sources utilizing reactor produced tritium source from the Savannah River Project. APT work is not performed in the Hot Cell facility per my conversation with Dick Heaton, project manager for the Radiochemistry Facility Hot Cell. There are at least two other "count labs" located in the facility that do limited general (AEA) tritium survey work. I spoke with Malcolm Fowler and he stated that his operations do not work with or discharge accelerator produced tritium to the RLWCS.

Disposal Practice: All discharges of liquid waste from these rooms currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.

8. **Name of Source:** Count Laboratory **Building:** TA-50-1-48
Name of Owner: Randa Brown **Group:** ESH-3
Phone: 665-0698 **Number of Sources:** 1
Description: A big part of the work load for this Lab is to analyze area radiological survey swipes and nose swipes via the use of "Fluor" liquid scintillation cocktail media and associated counting equipment.

During our phone conversation, Randa Brown indicated to me that once analysis is completed, the unused portions of the remaining samples are traditionally sent back to the requester for final disposal. I have discovered that past samples analyzed at the TA-50, Room 48 count room, some of which originated from the TA-53 LAMP Facility, may have been discharged to the RLWCS. These samples were generated between October, 1992 to October 1994 and possibly contained trace or minute amounts of accelerator produced tritium, but I might add that these samples were analyzed prior to discharge and routinely found to contain No Detectable Amount (NDA) of tritium.

I have made arrangements with Randa for the immediate revision of ESH-4 policies and procedures governing count lab operations and the implementation of and adherence to the TA-50 Liquid Waste Operations WAC as well as all discharge requirements which effectively prohibits the discharge of any accelerator produced tritium to the RLWCS.

Disposal Practice: All discharges of liquid waste from this operation currently meet the TA-50 Liquid Waste Treatment Facility Waste Acceptance Criteria.

9. **Name of Source:** EM/ER/D & D Activities **Building:** Multiple WorkSights
Name of Owner: Miguel Salazar **Group:** EM/ER/D&D
Phone: 665-3056 **Number of Sources:** Not Known
Description: There is some question concerning the waste disposal practices of Decontamination and Decommissioning Activities at D&D Sites. Of particular interest are liquid waste generated from D&D sites by the washdown of contaminated structures as well as rinse water from field activities. Also of concern is the purge water from contaminated wells where tritium is known to exist.

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Disposal Practice: Prompt actions must be undertaken immediately by Facility Management and respective Group Leaders for full compliance with all facets of the proper disposal criteria governing discharge of liquid waste to the Radioactive Liquid Waste Collection System. Additionally, administrative requirements should be immediately incorporated into the EM/ER/D&D waste disposal procedures that would prohibit the disposal of any accelerator produced tritium liquid waste generated from the interim storage and /or disposal of these materials. ESH-18, Water Quality and Hydrology personnel are available to assist the responsible parties involved in their efforts to establish these regulatory requirements.