



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

JUN 26 1996

Docket No. 040-01266

License No. SUB-466 (Retired)

SECOR International Incorporated
ATTN: Thomas M. Kreutz, P.E.
Senior Engineer
355 Union Boulevard
Suite 200
Lakewood, Colorado 80228-1500

SUBJECT: WORK PLAN FOR RADIOACTIVE MATERIALS SCREENING AND REMEDIATION
TENNECO POLYMERS, INC. SITE, FORDS, NEW JERSEY

Dear Mr. Kreutz:

This refers to the subject report that was submitted with your letter dated August 7, 1995. In order to continue our review, we need the following additional information:

1. Section 3.2, Page 3-1, and Sections I.F.3, Page 2, and II.E, Page 4, of the Health and Safety Plan (HSP) state that you will use a clean-up limit of 35 picocuries per gram (pCi/g) for uranium-238. The ratios of the activity of the protactinium-234m to uranium-235 isotopes in the soil samples collected by NRC Region I during the March 15-16, 1995 inspection indicate the soil is contaminated with natural uranium, uranium depleted in the uranium-235 isotope, and uranium enriched in the uranium-235 isotope. The appropriate guidelines for natural uranium, depleted uranium, and enriched uranium are listed in "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" (enclosed) and are 10 picocuries per gram (pCi/g) (U-234 plus U-238), 35 pCi/g (U-234 plus U-235 plus U-238), and 30 pCi/g (U-234 plus U-235 plus U-238), respectively. If the soil contains two or more radioactive contaminants, the unity rule should be used to determine if the soil concentrations are below established criteria. The unity rule is described in 10 CFR 20, Appendix B, Footnote 4 (enclosed). Please provide the soil concentration criteria that you will use.
2. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or termination of License for Byproduct, Source, or Special Nuclear Material" (enclosed) provides guidelines for the remediation of surface contamination. The appropriate guidelines for depleted, enriched, and natural uranium are:

5,000 disintegrations per minute per 100 square centimeters
(dpm/100 cm²) for the average alpha emissions;

15,000 dpm/100 cm² for the maximum alpha emissions; and

B/g

1,000 dpm/100 cm² for removable alpha emissions.

Although the guidelines are for alpha emissions, alpha radiation may undergo significant and inconsistent attenuation/absorption when the contaminated surface is porous, rough, dirty, damp, etc. Measurement of alpha radiations may, therefore, not be a reliable indicator of the true activity present. Since, beta radiations are less subject to surface losses, beta measurements usually provide a more accurate determination of surface activity; and, therefore, may be used. If beta measurements are used in lieu of alpha measurements, beta to alpha emission ratios must be considered when determining the surface activity for comparison with the guideline value.

3. Section 1.0, Page 1-1 states that removal of contaminated materials will be to approximate background levels. Section 3.1, Page 3-1 states that NRC guidelines and concurrence will be utilized to demonstrate that the site is free from radioactive contamination. Please specify whether you will remediate to background levels or to a set of specified criteria.
4. Section 3.2, Page 3-1 and II.E, Page 4 of the HSP provides a guideline limit for radium-226. The NRC does not have regulatory authority for radium-226. Although the NRC's guideline for natural uranium concentrations in soil is based on radium-226, a radium-226 guideline is inappropriate for use for uranium contamination in soil. Please remove the guideline from the plan or amend the plan, if needed, to meet any state guideline.
5. Section 3.8.1, Page 3-5 and Section 4.1.4, Page 4-2 provides the procedure for determining background gamma exposure rates. Please provide your procedure for determining the background concentrations of uranium in soil.
6. Section 3.8.5, Page 3-7 states that unaffected buildings exhibiting exposure rates not within the statistical range of background values will be subject to further evaluation. Please specify the statistical range (in standard deviations) that you will use as your trigger level and the type of activities you will include in your evaluation.
7. Section 3.9.1, Page 3-7 discusses your soil sampling techniques. Please provide the counting geometry, the size of the paint can, the minimum detectable activity (MDA) of the counting system for this geometry, instrument type, and calibration procedures.
8. Section 3.9.3, Page 3-9 states that areas with elevated gamma exposure rate readings will be wiped to determine the amount of removable surface activity. Section 4.3.2, Page 4-7 states that a minimum of 30 wipes will be collected within the affected areas. Fixed surface contamination measurements were not addressed. Section 4.2.3 of NUREG/CR-5849 (enclosed) states that 100 percent of affected area floor and lower wall surfaces are performed for all radiations which may be emitted from the radionuclides of interest. The overhead structures in Buildings K-12 and 12A should also be surveyed. Please provide your final survey plan for determining fixed and removable surface

*Response
in 3.10.2*

contamination activity on building surfaces and equipment.

9. Section 4.2.1, Page 4-3 states that final confirmatory soil samples will be obtained from excavations at a statistically-valid frequency. Section 4.3.1, Page 4-7 states affected areas with the highest gamma exposure rate readings will be sampled for analysis. Soil concentrations on the order of guideline values may not be detectable by gamma exposure rate measurements. Please provide a specific soil sampling plan for affected and unaffected areas that is commensurate with the guidance provided in NUREG/CR-5849. *Section 4/3*
10. Section 3.9.4, Page 3-9 describes groundwater sampling if field activities indicate that groundwater may have been impacted by radioactive materials. Describe how you will demonstrate that groundwater has not been contaminated without performing additional groundwater sampling. Please provide the most recent groundwater data from wells M23S-1 and M23S-2. *3.10.11*
11. Table 1 and Figure 2 indicate that Samples 1 and 2 are borings of the soil beneath the concrete floor of Building 12A. Both samples indicate elevated levels of uranium-238.
- a. Describe how you will survey the soil beneath the concrete floors in Buildings K-12 and 12A and the concrete foundation at the former Building K-7 location to determine the uranium concentration in soil. Indicate the most likely pathway the uranium contamination traveled to get beneath the concrete.
- b. Describe how contaminated soil under the concrete will be remediated.

Final survey procedures for soil within buildings can be the same as those used for outdoor areas.

12. Section 2.1, Page 2-1 states that operations were limited to one area of the facility. Please provide a determination of whether there were any other locations of use, including storage areas, that were utilized during previous licensed activities. Please specifically identify the affected and unaffected areas in the outdoor areas and within the buildings of the facility.
13. Section 2.2, Page 2-1 states that water from the portion of the facility near Buildings K-12 and K-7 was collected in catch basins, piped to a central sump, and pumped to a POTW.
- a. Was the collected water affected by licensed operations?

- b. Do any of the pipes in this system connect to the on-site wastewater treatment plant?
14. Was radioactive contaminated water treated in the on-site wastewater treatment plant? If yes, where was radioactive contaminated sludge resulting from the treatment of the contaminated water disposed?
15. Please describe any pipes, drains, and catch basins associated with the affected structures. Provide a survey plan for the pipes, drains, and catch basins in affected areas.
16. Section 3.5, Page 3-3 and Section 4.1.5, Page 4-2 states that signs will be posted in work areas. Confirm that the postings will comply with 10 CFR 20.1902.
17. Confirm the gates of the perimeter fences are locked or monitored at all times.
18. Section 4.2.1, Page 4-4 states that if no remaining radioactive material exists, segregated soils will be placed back into the excavations, followed by fill soils. Please confirm that excavations will not be filled until after the NRC's confirmatory survey.
19. Section 4.2.2, Page 4-4 describes the use of concrete saws for removal of concrete. If wet saws are used, describe how the water effluent will be collected, sampled, and disposed. If dry saws are used, describe how dust will be controlled.
20. Section 4.2.4, Page 4-5 states that Supersacks filled with contaminated concrete and soil will be placed within a secure storage area. 4.2.4
- a. Provide the location of the storage area.
- b. Provide a survey plan for the storage area to demonstrate that it will meet NRC's criteria for release for unrestricted use.
21. Section IV.A, Page 6 of the HSP provides the Predominant Potential Site Chemical Hazards.
- a. Will mixed waste be generated during remediation?
- b. How will mixed waste be analyzed and disposed?
- c. Will mixed waste be processed on-site? If so, provide the procedure for processing the waste.
22. Describe your air sampling program to monitor and control airborne contamination. Include instrument specifications and sample collection and analysis procedures.

23. ✓ The title page of the HSP identifies Thomas M. Kreutz as the Health and Safety Officer (HSO). Please indicate whether Mr. Kreutz is the Site Health and Safety Officer (SH&SO) and describe the SH&SO's formal training in the following areas:
- principles and practices of radiation protection;
 - radioactivity measurements standardization and monitoring techniques and instruments;
 - mathematics and calculations basic to the use and measurement of radioactivity; and
 - biological effects of radiation.

In addition, describe the specific isotopes the individual has handled, the maximum quantities of materials handled, where the experience was gained, the duration of the experience, and the type of use.

24. ✓ Section I.A, Page 1 of the HSP provides the duties and responsibilities of the SH&SO. Please confirm that the typical duties of the site SH&SO are:

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- To assess radiological hazards and prescribe, and ensure the implementation of, appropriate radiation safety precautions.
 - To ensure that the remediation operations will be by or under the direct supervision of the SH&SO.
 - To ensure that all users (where appropriate) were personnel monitoring equipment when using NRC regulated materials.
 - To ensure that all required records are maintained.

25. ✓ Please describe the reporting and communication relationship that on-site personnel, including the SH&SO, will have with Tenneco management.

26. ✓ Section V.C., Page 10 of HSP states that if soil or concrete dust aerosols are generated, workers will wear respirators with radionuclide cartridges. Please confirm that in accordance with 10 CFR 20.1701, you will use, to the extent practical, process or other engineering controls to control the concentrations of radioactive material in air.

- If it is not practical to apply process or engineering controls and you determine that your respiratory protection equipment must be used, be sure to make the notification required by 10 CFR 20.1703(d).
- Confirm that if you use respiratory protection equipment, you will comply with 10 CFR 20.1703.

T. Kreutz
SECOR International Incorporated

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27. Confirm that all activities with NRC regulated material will be conducted in compliance with 10 CFR Parts 19, 20, and 71.0 through 71.10 (enclosed).
28. Please submit a copy of your QA/QC procedures for sample collection and analysis. ← 3.10.8
29. Provide the following for all radiation detection and measurement equipment: 3.10.8
 - a. Describe the type, number, and use of available instruments, including the manufacturer and model number of each type.
 - b. Submit a description of the calibration procedures. If your instruments are calibrated by another company, include their name and the NRC or Agreement State License Number.
 - c. Confirm that survey instruments will be checked with a dedicated check source for proper operation at the beginning of each day of use and that records of the daily check will be maintained.
 - d. State the lower limit of detection (LLD) and efficiency for each piece of radiation detection equipment. Please provide your method for determining an instrument's LLD.
30. Confirm that all final survey data will be provided with the final report.
31. Section 2.1, Page 2-1 states that the facility processed 200 to 400 pounds of uranyl nitrate per year. The enclosed letter dated March 24, 1961 from Tenneco Chemicals, Incorporated dated March 24, 1961 indicates that the facility lost 200 to 400 pounds of uranyl nitrate per year. Please confirm that this information is accurate.

Sincerely,

Mari Miller
for
Ronald R. Bellamy, Chief
Decommissioning and Lab Branch

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T. Kreutz
SECOR International Incorporated

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Enclosures:

1. Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations
2. 10 CFR 20
3. Guidelines for Decontamination of Facilities and Equipment Prior to release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material
4. NUREG/CR-5849
5. 10 CFR 19
6. 10 CFR 71
7. Tenneco letter dated March 24, 1961

cc:

State of New Jersey

T. Kreutz
SECOR International Incorporated

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