

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 96-001

Docket No. 040-00341 (Former)

Former License No. STC-133

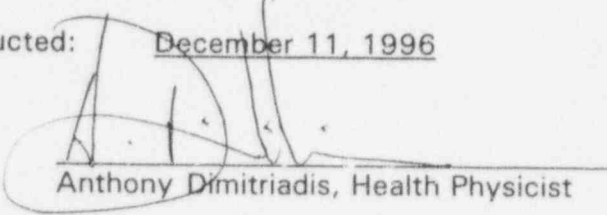
Former Licensee: Defense Logistics Agency
Defense National Stockpile Center
1745 Jefferson Davis Highway
Arlington, Virginia 22202

Facility Name: Curtis Bay Depot

Inspection at: Anne Arundel County Property
Route 710 (Arsenal Road)
Glen Burnie, Maryland

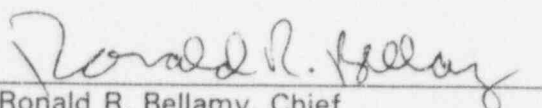
Inspection Conducted: December 11, 1996

Inspector:


Anthony Dimitriadis, Health Physicist

1/16/97
date

Approved by:


Ronald R. Bellamy, Chief
Decommissioning & Laboratory Branch

January 16, 1997
date

Inspection Summary: Routine announced inspection on December 11, 1996, Inspection Report No. 040-00341/96-001.

Areas Inspected: This inspection was limited to the following: Records of training and instruction of employees; radiation protection practices; instrumentation; radioactive waste packaging and transportation; personnel monitoring records; decommissioning practices; and independent measurements.

Results: The inspector observed that decommissioning activities were completed and confirmatory measurements were being performed. The licensee's survey techniques for radionuclides in the buildings and soil were capable of determining compliance with NRC's most restrictive residual contamination limits for thorium present in soil. No safety concerns were identified.

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DETAILS

1. Persons Contacted

- * F. Kevin Reilly - Environmental Protection Specialist, Defense Logistics Agency
Wade Adams - Project Manager, Oak Ridge Institute of Science and Education
Joseph Scholle, Depot Manager, Defense Logistics Agency
Dominic A. Orlando - Project Manager, U.S. NRC, NMSS, LLWM&D
- * indicates those present at exit interview

2. Background

Curtis Bay Depot was authorized by the Atomic Energy Commission to store monazite sands and thorium residues under License No. STC-133, (previously License No. D-195), since 1957 for stockpiling and resale purposes. Curtis Bay Depot is currently part of the National Defense Stockpile and is located at 710 Ordnance Road in Curtis Bay, a suburb of Baltimore in the northeast corner of Anne Arundel County, Maryland. The facility is located approximately 8 km (5 miles) northeast of the Baltimore-Washington International Airport, in an industrialized area. The land and warehouses were located on a 2.5 hectare (8 acre) plot of land in the northwest section of the Curtis Bay Depot and separated from the depot property by a chain link security fence.

In the late 1970s, the General Services Administration (GSA) stored thorium nitrate (mantle and reactor grades, average 47% $\text{Th}(\text{NO}_3)_2$) in fiber and steel drums in Buildings M-421 through M-424 and L-411 through L-415 at the Curtis Bay Depot under License No. STC-133. In 1977, GSA notified the NRC Region I Office of its intent to sell a 87 acre parcel of the Curtis Bay Depot to Anne Arundel County which included 19 abandoned structures, 9 of which were used to store thorium nitrate. The NRC performed a radiological survey which identified residual contamination in the wood flooring of the structures on the property. The licensee decontaminated portions of these structures by removing contaminated structural material (mainly wood). In 1977, no soil guidelines existed for residual thorium contamination. Soil analyses at the time identified thorium concentration in excess of the current guideline of 10 picocuries per gram under 6 of the structures. Based on the existing guidelines for release of buildings and facilities for that time, the 87 acre parcel was released for unrestricted use and subsequently sold to Anne Arundel County in 1978.

Administration of the Curtis Bay Depot was transferred to the Defense Logistics Agency (DLA) from GSA in 1988. Since purchasing the property, Anne Arundel County has been actively seeking development of the land. In 1992, local residents raised concerns about the presence of residual contamination during the

consideration of the site for a criminal detention center. In response, the NRC requested that the Oak Ridge Institute for Science and Education (ORISE) conduct a radiological survey of the structures on the county property and adjacent land to determine the current radiological condition of the site. As a result of their May 1992 survey, ORISE identified isolated thorium contamination in excess of the release guidelines for unrestricted use in eight of the structures.

The county and DLA jointly funded the remediation of the structures and surrounding soils. The removal of siding containing asbestos was funded by the county. DLA funded the radiological remediation portion of the project. DLA submitted a final radiological decommissioning plan which was approved by NRC on July 7, 1994. The State of Maryland approved the asbestos removal plan. Contractors began remediation in July 1994 and completed work in October 1995. The radiological contractor for DLA was RUST Federal Services which was subsequently purchased by OHM Remediation Services, Inc.

The inspector noted during the inspection that the structures had been dismantled and material removed from the site.

3. Training and Instruction of Employees

The inspector reviewed the licensee's program for training and instruction of workers, including contractor personnel, who perform the majority of the work. Contractor and subcontractor personnel receive annual radiation safety training in accordance with the training program prepared by RUST/OHM Remediation Services, Inc. Contractor employees receive approximately four to eight hours of radiation safety training prior to the start of work at the site, depending on the individual's background and previous training. At the conclusion of the training session, an examination is given to the participants to verify understanding of the course contents. No work is permitted on the site before the individual passes a physical and receives the training described above. A score of 80 or better is required on the written exam prior to commencing work on the site. Individuals entering a restricted area are required to read and sign a radiation work permit (RWP). This was often part of a morning safety briefing typically conducted daily.

The inspector reviewed training records of employees, the examinations given, results of examinations, and determined that the level of training was commensurate with the potential radiological hazards in the restricted area as required by 10 CFR 19.12.

No safety concerns were identified.

4. Radiation Protection Practices

Standard operating procedures require each individual to wear Level D protective clothing which includes a hard hat, dust mask, safety glasses and safety shoes when working on site.

No safety concerns were identified.

5. Instrumentation

The inspector reviewed the licensee's instrumentation program. A brief list of the instruments used by the licensee contractor include:

- a. Ludlum model 19 micro-R meter;
- b. Eberline Model Smart 1 and 2;
- c. Eberline model RM-20;
- c. Proteon Gas Proportional counter with mylar window;
- d. ESP-2 model smart-portable survey meter which may be used in conjunction with a model HP-260 pancake probe, or a model AC-3 alpha probe;
- e. Ludlum model 4221 data logger coupled to a model 4337 450 cm² gas proportional beta-gamma probe modified to be hand-held.
- f. Eberline ESP-1 connected to an Eberline SPA-3 NaI(Tl) probe was used for soil surveys. The probe is typically held approximately 1 inch above the ground during use.

Instrument calibration records were reviewed. The exposure rate and reference source serial numbers were clearly listed on each instrument calibration record. Calibration records included the date of calibration, various calibration points, detector model and serial number, geometry used, source(s) used, and detection efficiency. The input sensitivity and instrument voltage settings are clearly indicated on the calibration record. Typical efficiencies for an Eberline ESP-1/AC-3-7 range between 33% - 41% . Contractor personnel also performed and recorded a daily instrument check which included the background, battery, and response to a check source used for all instruments.

Smears of removable contamination that were conducted during decommissioning activities were counted in a low background gas proportional counter (Proteon) for gross alpha and gross beta activity. A response check was performed daily. NIST traceable alpha and beta check sources, Th-230 and Tc-99, were used for response in this instrument. Typical efficiencies are 16% for alpha and 25% for beta.

No safety concerns were identified.

6. Radioactive Waste Packaging and Transportation

Radioactive waste generated on site was shipped to an authorized waste disposal site located in Clive, Utah, operated by Envirocare, Inc. Radioactive waste shipped on October 17, 1995, was packed in 8 metal roll-off boxes. The typical metal roll-off boxes used for shipping the building debris have a volume of 25 ft³, with each weighing approximately 40,000 lbs. Each box contained approximately 0.31 mCi of Th-230 and 0.78 mCi of Th-232. The waste was shipped as LSA, UN-2912, in accordance with 49 CFR 172.101.

No safety concerns were identified.

7. Independent Measurements

During this inspection, DLA representatives discussed the status of site decommissioning activities with the inspector. At the time of the inspection, ORISE was on site performing confirmatory surveys for support of ultimate site release.

The inspector took gamma exposure rate measurements during the inspection, in one area of decommissioning. The measurements were made with a Ludlum Micro-R meter (NRC Serial No. 019634) calibrated to cesium-137. A background exposure rate for this instrument was 5-6 microRoentgens per hour (μ R/hr) in the fence area around the site. The highest gamma exposure rate measured in a restricted area was 7 μ R/hr.

No safety concerns were identified.

8. Exit Interviews

The results of the inspection were discussed with the individuals indicated in Section 1 of this report at the conclusion of the inspection.