

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 9999990001/94-017

License No. None

Docket No. None

Inspection At: U.S. General Service Administration
Federal Property Resources Center
670 Arsenal Street
Watertown, Massachusetts

Inspection Conducted: August 29 and 30, 1994

Inspector:

Mark R. Bouwens
Mark R. Bouwens
Health Physicist
Project Manager

9-30-94
date

Andrew J. Schwartz
Andrew J. Schwartz
Physical Science Aide

9/30/94
date

Approved by:

John D. Kinneman
John D. Kinneman, Chief
Site Decommissioning Section

10-4-94
date

Inspection Summary: Routine, announced safety inspection conducted
August 29 and 30, 1994 (Inspection
No. 99990001/94-017).

Areas Inspected: Organization for decommissioning; facilities and equipment; posting and labelling; instrumentation and calibration; training; and characterization activities.

Results: One deviation from approved procedures was identified: failure to restrict access to the restricted area of the site to individuals who were briefed on the RWP for the restricted area and who signed the RWP briefing sheet for the restricted area.

DETAILS

1. Persons Contacted

*Dennis Waskiewicz, Project Manager, U.S. Army Corps of Engineers, New England Division (NED)

Beverly Lawrence, Project Engineer, NED

*Peter Cornetta, Radiation Safety Officer, U.S. Army Research Laboratory (ARL)

Robert Chase, Technical Monitor, ARL

Carolyn Burns, Quality Assurance Evaluator/Health Physicist (QAE/HP), ccB Enterprises

*Mark Helstrom, Project Manager, Morrison Knudsen (MK)

John Anstead, Hydrogeologist, MK

Daryl Samuels, Radiological Control and Safety Officer, Scientific Ecology Group (SEG)

*John Andrews, Senior Health Physicist, SEG

Ron Baldry, Health Physicist, Micrad

* Denotes those present at exit interview.

2. Background

The Watertown Arsenal GSA Property (GSA Property) is northeast of the current U.S. Army Research Laboratory (ARL) and was formerly the northeastern part of the Watertown Arsenal. The GSA Property is about five hectares (12 acres) and includes five buildings and an area known as the 'burn pit'. The property was used by the U.S. Atomic Energy Commission (AEC), the Manhattan Engineer District (MED), and the Department of the Army for the packaging and storing of radioactive waste, burning of uranium scrap, and staging of radioactive waste shipments from the 1940's to the 1960's. The burning of uranium scrap took place in the burn pit. The use of source material was authorized at the GSA Property by AEC License No. SUB-238 from May 9, 1961 to January 17, 1974 when the area was released for unrestricted use by the AEC. Title to the property was transferred to the U.S. General Services Administration (GSA) on August 16, 1968.

The U.S. Department of Energy (DOE) surveyed the GSA Property from July 13, 1981 to September 4, 1981 as part of a program to determine the condition of sites formerly utilized by MED and AEC for work involving the handling of radioactive materials. The results of the survey were published in a DOE report, dated October 1983 (DOE Report).

At the request of GSA, the U.S. Army contracted Chem-Nuclear Systems, Inc. (CNSI) to remediate the GSA Property. CNSI conducted remediation and characterization activities at the site from October 1988 to August 6, 1990. The project was terminated because the allotted funds were depleted.

In May 1992, at the request of GSA, the U.S. Army Corps of Engineers, New England Division (NED), agreed to remediate the GSA Property. NED submitted a Scope of Work (SOW) for remediating the site on October 27, 1992 and began remediation activities in January 1993.

Region I determined that the SOW was acceptable on April 15, 1993 and inspected the remediation activities on June 15 and 16, 1993. NED suspended remediation activities on July 9, 1993 due to the excessive volume of waste being generated and the potential for the remediation activities to spread contamination into uncontaminated areas.

NED determined that additional characterization of the burn pit was warranted, and on June 1, 1994 submitted to the NRC the Draft Work Plan for Additional GSA Site Characterization, dated May 24, 1994. The Draft Work Plan includes a characterization of the burn pit area and Property 20. Property 20 was the northern tip of the GSA Property that the former Watertown Arsenal was granted by the Commonwealth of Massachusetts until August 22, 1951. On June 22, 1994, NED submitted the General Services Administration Radiological Characterization Report, Draft 1, dated June 1994 (GSA Site Characterization). NRC approved the Draft Work Plan and the GSA Site Characterization on July 7, 1994 with a request for NED to add two additional areas to the Work Plan. On July 26, 1994, NED submitted the Work Plan, Revision I to the NRC. The Work Plan, Revision I includes the two additional areas and other improvements and minor changes.

3. Organization for Decommissioning

NED agreed to remediate the GSA Property for GSA in May 1992. The remediation activities are funded through the Formerly Used Defense Sites program (FUDS). NED keeps ARL apprised of the status of the site. NED has contracted Morisson-Knudsen (MK) to conduct the remediation activities. MK has contracted Westinghouse Scientific Ecology Group (SEG) to provide health physics services necessary for the remediation activities on the site. The MK and SEG personnel conducting remediation activities at the GSA property are also conducting remediation activities at ARL.

No safety concerns were identified.

4. Facilities and Equipment

Trailers and buildings at ARL provide space for offices, analytical equipment, radiation survey instrumentation, training, and storage for MK and SEG. Building 237 at the GSA Property is a shed that is used as a dress out area and for storage. The site is enclosed by a fence that approximates the perimeter boundary; there is about one acre outside of the fence on the northeast side of the property. Property 20 is about a one acre parcel that connects to the northeast side of the GSA Property. A swamp covers approximately 30% of Property 20 on its northeast side. A second fence separates the area of the three large buildings from the majority of the site, including the burn pit area. The two fences appeared intact. An additional fence defining the burn pit area has been partially dismantled to permit remediation activities.

No safety concerns were identified.

5. Posting and Labelling

The burn pit area and the path leading from the dress out area to the burn pit are roped off or fenced and appropriately posted. The perimeter fence of the site was appropriately posted.

No safety concerns were identified.

6. Instrumentation and Calibration

Surveys were conducted by the inspectors with two Ludlum Model 14C survey instruments equipped with GM end window survey probes and GM pancake survey probes and two Ludlum Model 19 microR meters. The Model 14C survey instruments (NRC Serial Nos. 033504 and 033509) were calibrated by EG&G on June 10, 1994. The Model 19 survey instruments (NRC Serial Nos. 033511 and 033515) were calibrated by EG&G on January 14, 1994. Background at the GSA Property for the Model 14C and Model 19 survey instruments was determined to be approximately 40 cpm and 20 microrentgen per hour ($\mu\text{R/hr}$), respectively.

A portable hi-purity germanium detector, Canberra Model #GR3020 is used with a gamma spectroscopy system to measure radionuclide concentrations in an approximately 100 m² area. The detector is capable of detecting the low energies of natural and depleted uranium radiation. The system is calibrated by the manufacturer and supplied with computer generated efficiency curves. Daily quality control checks are performed with a NIST traceable mixed gamma source to assure proper functionality of the system. The system is set to scan for the same library of radionuclides as used by ARL, including natural uranium.

No safety concerns were identified.

7. Training

The annex in Building 235 is used to control access to the restricted area of the site by having each individual entering and leaving the restricted area pass through the annex. An individual entering the restricted area for the first time is briefed on the Radiation Work Permit (RWP) for the restricted area. A sign-off sheet is signed by the individual indicating that the person was briefed. Additionally, every individual who enters or leaves the restricted area, must sign-in or sign-out, respectively, on a sign-in/out sheet located in the annex. The inspector compared a representative sample of signatures on the RWP sign-in/out sheets between August 22-30, 1994 with the RWP briefing sign-off sheet. Four of the names that appeared on the RWP sign-in/off sheet dated August 25, 1994 were not on the RWP briefing sign-off sheet. Providing access to the restricted area of the site to individuals who were not briefed on the RWP for the restricted area and who did not sign the RWP briefing sheet for the restricted area is a deviation from the approved procedures in the Work Plan.

The inspectors reviewed the radiation training records of the four individuals who had not signed the RWP briefing sign-off sheet. Each of the four individuals appeared to have adequate radiological training for their function. Their radiological training consisted of a minimum of a two hour course and a test. The course curriculum and test were reviewed by the inspector. The materials appeared appropriate.

One deviation of approved procedures was identified.

8. Characterization Activities

To enter the restricted area (the burn pit area) booties and rubber foot covers are worn by workers and observers. Additional protective clothing is necessary for some workers. When exiting the area, the rubber foot covers and the booties are removed. The booties are disposed as radioactive waste and the foot covers are left for reuse. Hands and feet are frisked with a GM detector equipped with a pancake probe before exiting the burn pit area. Workers were observed following the proper procedures while entering and exiting the restricted area.

Approximately six large concrete blocks were removed from the bottom of the burn pit during the 1993 excavations. The blocks were set in a separate area adjacent to the burn pit and remediated by scabbling the surfaces. The blocks ranged in size from about 0.3 to 4 m³ (10 to 140 ft³). Prior to remediation of the blocks, chips from the surface of the blocks were reported as having elevated concentrations of radioactive materials indicating the presence of DU and natural radioactive materials. The inspectors surveyed a representative surface area of three blocks with a microR meter and a GM meter. Elevated measurements were not identified.

The inspectors surveyed two areas of the site previously identified in the ANL Report as having elevated radiation levels. The first location is approximately in the center of the northwest perimeter fence of the burn pit area. Elevated measurements as high as 50 μ R/hr and 300 cpm were identified at the surface with the microR meter and the GM meter, respectively. The area of elevated measurements is about one m². The second location is about 150 ft south of Building 237 and near well W-6A. Elevated measurements as high as 40 μ R/hr were identified at the surface with the microR meter. Elevated measurements were not identified with the GM detector. The area of elevated measurements is about four m². The contractor marked both locations and stated that additional radiological characterization would be conducted in those locations.

NED took 13 borings around the burn pit to determine the extent of the subsurface contamination. Preliminary results from some of the borings indicates radiological contamination down to 11 ft in locations along the perimeter of the burn pit. Concentrations of radium were detected in some of the boring samples. NED is determining if the radium concentrations are from natural sources.

Building 653 is a small pumphouse outside of the front gate of the GSA Property. Outside surfaces of some of the pipes and equipment in the pumphouse were surveyed by the inspector. Elevated radiation readings were not identified.

The northeast tip of the site outside of the perimeter fence and Property 20 were investigated by the inspectors. The area is overgrown with extremely dense vegetation that includes obstacles such as briars and poison ivy. NED removed some vegetation from this area to conduct radiological characterization activities. The swamp on Property 20 is approximately five feet below the surface of the surrounding property. A 1974 aerial photograph in the Preliminary Assessment, dated October 1993 appears to show that the surrounding property was filled to what is now the swamp perimeter.

One of two partially buried metal barrels that were previously identified by the Commonwealth of Massachusetts was identified by the inspector. There were no external markings on the barrel or any indication of the barrels previous use. NED plans to excavate and open the drums when their contractor ABB conducts a chemical hazard characterization; the characterization of the barrels will include a radiological characterization.

NED conducted a land survey to locate the property lines of the GSA Property and Property 20 and establish a grid. NED was unable to establish a full grid on the northeast tip of the site or on Property 20 due to large inaccessible areas of overgrown vegetation; however, large paths were cut through the vegetation allowing adequate access to the site so that the majority of the property can be surveyed. The areas are surveyed with a hi-purity germanium detector called the INSPECTOR. The INSPECTOR is capable of surveying a 100 m² area by being placed one meter above the surface and in the center of the area. The only part of the property that was identified as not accessible to the INSPECTOR was a portion of the swamp.

No safety concerns were identified.

9. Exit Interview

The results of the inspection were discussed with the licensee representatives identified in Section 1.