

U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
CT Radium Orphan Sources - Removal Polrep
Final Removal Polrep



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I

Subject: POLREP #2
Final
CT Radium Orphan Sources
01MZ
Windsor, CT
Latitude: 41.8018840 Longitude: -72.6616340

To:
From: Michael Barry, OSC
Date: 9/29/2016
Reporting Period: 9/23 to 9/29/2016

1. Introduction

1.1 Background

Site Number:	01MZ	Contract Number:	EP-S1-16-01
D.O. Number:	008	Action Memo Date:	5/19/2016
Response Authority:	CERCLA	Response Type:	Time-Critical
Response Lead:	EPA	Incident Category:	Removal Action
NPL Status:	Non NPL	Operable Unit:	
Mobilization Date:	9/23/2016	Start Date:	9/23/2016
Demob Date:	9/29/2016	Completion Date:	9/29/2016
CERCLIS ID:	N/A	RCRIS ID:	
ERNS No.:		State Notification:	
FPN#:		Reimbursable Account #:	

1.1.1 Incident Category

Time-Critical Removal Action

1.1.2 Site Description

On 01 October 2015, Connecticut Department of Energy and Environmental Protection (CT DEEP) responded to a call from a residential property owner regarding radioactive materials discovered on the property located in Middlebury, Connecticut. The property owner had inherited the residence from her deceased father, a retired surgeon, who had apparently brought the radioactive materials from the facility where he had his medical practice to his residence at some time prior to when he retired in 1986, but likely several decades earlier.

A CT DEEP Radiation Control Physicist mobilized to the Site with hand-held radiation monitoring instruments. Gamma radiation monitoring of the source exceeded the upper range of an Eberline RO-20 hand-held ion-chamber instrument. Screening with an identiFINDER field gamma spectrometer determined that the isotope was Radium 226 (Ra-226). The Radiation Control Physicist contacted additional CT DEEP personnel for assistance with containerizing, securing, and removing the sources from the residential property to the CT DEEP Radiation Laboratory. The decision by CT DEEP to perform an emergency removal was based on their assessment that the orphan medical sources presented an immediate, imminent, substantial and reasonable threat of radiation and radioactive contamination to the environment, homeowner, and the public. After removing the orphan medical sources, CT DEEP radiation personnel conducted radiation and contamination surveys to determine no radiological contamination remained above background conditions at the residential property.

On 02 October 2015, CT DEEP contacted EPA to obtain technical assistance in regards to the Ra-226 orphan medical sources now located within the CT DEEP radiation laboratory. A temporary storage location and container within the laboratory was engineered in order to secure the sources as CT DEEP began to explore options for transportation and disposal. From October through January, CT DEEP consulted regularly with EPA. On 28 January, 2016, CT DEEP made a formal request to EPA for assistance with proper transportation and disposal of the Ra-226 sources.

On 09 March 2016, EPA OSCs Mike Barry and Natalie McClaine, EPA Health & Safety Officer/Radiation Safety Officer Tony Honnell, and START members Eric Ackerman and Paul Callahan performed a PA/SI and documented the temporary storage conditions and verified the characteristics of the Ra-226 orphan medical sources.

1.1.2.1 Location

The Site is located at the CT DEEP radiation program laboratory at 9 Windsor Avenue in Windsor, Hartford County, Connecticut. The geographic coordinates of the Site are:

42° 48' 7.5" North latitude; and
72° 39' 40.2" West longitude.

1.1.2.2 Description of Threat

The CERCLA hazardous substances, according to 40 CFR Ch. 1 §302.4 - Radionuclides, that are being released, or for which there is a threat of release, are listed in table 1 below:

Table 1: Orphan Medical Sources Inventory

Source	Quantity	Dimensions		Measured Dose Rate at 1 meter (mrem/hr)	Calculated Activity (mCi = mg)	Per Source Activity (mCi = mg)
Ra-226 Tubes	2	3" length	3/16" diameter	120	145	72.5
Ra-226 Needles	9	½" length	1/16" diameter	12	15	1.7
Ra-226 Plaque	1	1"x1" square	3/16" thick	30	36	36

CT DEEP personnel detected gamma radiation as high as 120 millirem per hour (mrem/hr) at one meter distance from the orphan medical sources, as well as elevated alpha radiation levels. Using the Specific Gamma Ray Dose Constant for Ra-226, CT DEEP personnel calculated the total source strength to be approximately 196 milliCuries (mCi); the CERCLA reportable quantity of Ra-226 is 100 milliCuries (mCi).

1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

On March 9, 2016, EPA and START conducted a PA/SI and discovered the following inspection results:

Table 2: Measured Radiation Levels on 09 March 2016

Matrix/Analytical Parameter	Gamma Radiation, micro Rem per hour (urem/hr)	Alpha Radiation, Counts per Minute (CPM)
Background Readings	8-10	0
Hallway	20	N/A
Door to room	50	N/A
Over pit/vault	150,000	0
On floor next to pit/vault	N/A	80

N/A = Not monitored at this location

If CT DEEP personnel were permitted access to the storage room containing the temporary Ra-226 orphan medical sources subsurface pit they could exceed their annual limit of radiation exposure for both radiation and non-radiation workers. Within the storage room and the temporary containment structure, the Ra-226 continues to decay to radon gas and then into daughter products via alpha decay. This alpha decay has and will continue to contaminate the areas nearest to the storage pit until the parent Ra-226 materials are properly disposed of.

2. Current Activities

2.1 Operations Section

2.1.1 Narrative

On March 9, 2016 EPA, START and CT DEEP met at the Site to conduct a PA/SI.

On May 16, 2016, an Action Memorandum was signed by the Office Director of the Office of Site Remediation and Restoration authorizing a removal action with the extramural removal project ceiling of \$326,700.

On 9/23/2016, EPA, START, CT DEEP, ERRS, and the ERRS subcontractor mobilized to the Site to conduct a removal action "mock-up", setup the transfer/repackaging area and perform rehearsals.

On 9/24/2016, the radium sources were transferred from the temporary storage area and packaging and packed in approved Type A packages and shipped off site to the disposal facility. The CTDEEP lab temporary storage and packaging area was decontaminated, radiation surveys were performed and released for unrestricted use. Subcontractor tools and equipment used during the removal remained in custody at the CTDEEP radiation lab to allow radioactive residual contamination to decay away to background levels. CTDEEP personnel performed radiation surveys and provide Health Physics support. All personnel demobilized from the scene at the completion of site activities.

On 9/28/2016 the 55 gallon-drum of miscellaneous low-level radioactive material comprised of used PPE, the

original and temporary packaging material (a lead-lined wood box and a steel pipe) and other miscellaneous materials was removed and transported to a licensed radioactive material storage facility.

On 9/29/2016 the subcontractor's tools and equipment staged for decay of residual radioactivity were cleared by CT DEEP radiation program personnel at background levels and were picked up by the subcontractor.

2.1.2 Response Actions to Date

- Conducted a Site walk with EPA contractors to determine appropriate equipment, personnel and utilities required.
- Developed a draft work procedure and Site Health and Safety Plan.
- Evaluated options for packaging sources.
- Obtained end disposal clearance at a certified facility.
- Procured and fabricated radioactive shipping packaging per radioactive materials shipping regulations.
- Finalized the work plan and health and safety plan.
- Rehearsed removal with mock-ups to minimize exposure and contamination.
- Mobilized personnel and equipment to the site.
- Delineated work zones and decontamination areas.
- Secured & controlled access by the public and project personnel to site and active work areas to keep radiation exposure as low as reasonably achievable (ALARA).
- Removed, packaged, labeled and shipped the Ra-226 sources and 55-gallon drum of PPE and misc packaging materials to licensed disposal facilities.
- CTDEEP lab was decontaminated and radiation surveys cleared areas impacted at background levels.
- The subcontractor, Cabrera, picked up their tools and equipment after clearance by CTDEEP to background levels.

2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

EPA obtained signed access agreements from the Director of the Radiation Division at CT DEEP.

2.1.4 Progress Metrics

Waste Stream	Medium	Quantity	Manifest #	Treatment	Disposal
Ra-226 orphan medical sources, packages in three Type A Packages, UN2915 Radioactive material	Source Material	3	RS152	N/A	Rad Soultions LLC 2955 Farrar Ave Modesto, CA 95354
55-gallon drum of Low-level radioactive waste consisting of discarded original and temporary source packaging, PPE, and miscellaneous waste materials	Packaging and PPE	1	TO-2016-313	N/A	TOXCO, Inc. 109 Flint Road Oak Ridge, TN 37830

2.2 Planning Section

2.2.1 Anticipated Activities

Removal activities on site are complete and no further activities are anticipated. This Final POLREP will be updated final trailing costs when they are available and the ERRS Task Order and START TDD will be closed after all administrative activities are completed. The removal action report will be drafted, finalized and distributed to the project team and site file. When all activities are completed the site file will be archived and the Administrative Record generated and filed.

2.2.1.1 Planned Response Activities: see above

2.2.1.2 Next Steps: see above

See above.

2.2.2 Issues: None

2.3 Logistics Section

None

2.4 Finance Section

No information available at this time.

2.5 Other Command Staff

2.5.1 Safety Officer

Mike Firsick - Supervising Radiation Control Physicist, Radiation Division at CT DEEP

Tony Honnellio, EPRB - Radiation Program & Safety Officer

2.5.2 Liaison Officer

Initial coordination with the CTDEEP Commissioner's Office was performed by the EPA LNO. On 9/27/2016 CTDEEP Commissioner's Office and Radiation Program expressed thanks for EPA's work on this site.

2.5.3 Information Officer

None

3. Participating Entities

3.1 Unified Command

EPA-OSC

EPA-Radiation Program Lead

CTDEEP-Radiation Program Manager

ERRS RM and Radiation Subcontractor Manager

3.2 Cooperating Agencies

None additional to above.

4. Personnel On Site

EPA OSC Mike Barry

EPA OSC Natalie McClaine

EPA Safety Officer/Radiation Program Contact Tony Honnellio

ERRS - Removal Manager

START - 1

Cabrera - Two Radiation Control Technicians (RCT)

Chase Environmental - 2

CTDEEP Radiation Program - 3

Total personnel on site:

EPA-3, ERRS & Subcontractors-4, START-1, CTDEEP-3, Total-11

5. Definition of Terms

None

6. Additional sources of information

6.1 Internet location of additional information/report

:

https://www.epaosc.org/site/site_profile.aspx?site_id=11446

6.2 Reporting Schedule

Removal Action Report when available.

7. Situational Reference Materials

None