

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



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region I

**Subject:** POLREP #1  
Initial  
CT Radium Orphan Sources  
01MZ  
Windsor, CT  
Latitude: 41.8018840 Longitude: -72.6616340

**To:** Polrep Distribution, USEPA-R1

**From:** Michael Barry, OSC

**Date:** 9/23/2016

**Reporting Period:** 9/23/2016

## 1. Introduction

### 1.1 Background

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

#### 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 Honnellio, 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".

On 9/24/2016, the removal action will commence and the radium sources will be removed on that day. Subcontractor tools and equipment used in the removal will remain in custody at the CTDEEP Radiation lab to allow radioactive residual contamination to decay away to non-detect and the subcontractor will remove them on or about 9/28/2016 pending clearance by the CTDEEP radiation lab program. Also on or about 9/27/2016, the remaining 55 gallon-drum of miscellaneous low level radioactive material comprising of used PPE and the original radium sources lead lined wood box packaging will be removed to a licensed radioactive material stowage facility.

**2.1.2 Response Actions to Date, prior to mobilization on 9/23/2016**

- 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. .

**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**

<i>Waste Stream</i>	<i>Medium</i>	<i>Quantity</i>	<i>Manifest #</i>	<i>Treatment</i>	<i>Disposal</i>

**2.2 Planning Section**

**2.2.1 Anticipated Activities**

**2.2.1.1 Planned Response Activities**

Approved response activities consist of the following:

- Finalize the work plan and health and safety plan;
- Rehearse removal with mock-ups to minimize exposure;
- Mobilize personnel and equipment to the Site;
- Delineate work zones and decontamination areas, as necessary;
- Install measures to prevent access by the public to contamination at the Site, as necessary;
- Remove Ra-226 sources;
- Facilitate disposal of hazardous substances at EPA and/or Nuclear Regulatory Commission approved off-site radioactive waste disposal facilities;
- Repair response-related damages and decontaminate as necessary the work spaces.

**2.2.1.2 Next Steps**

See above.

**2.2.2 Issues**

N/A

**2.3 Logistics Section**

N/A

**2.4 Finance Section**

**2.4.1 Narrative**

A task order of \$225,000 has been issued to ERRS.

<b>COST CATEGORY</b>		<b>CEILING</b>
<i>REGIONAL REMOVAL ALLOWANCE COSTS:</i>		
ERRS Contractor		\$225,000.00
Interagency Agreement		\$0,000.00
<i>OTHER EXTRAMURAL COSTS NOT FUNDED FROM THE REGIONAL ALLOWANCE:</i>		
START Contractor		\$20,000.00
Extramural Subtotal		\$245,000.00
Extramural Contingency	33%	\$81,700.00
<b>TOTAL, REMOVAL ACTION CEILING</b>		<b>\$326,700.00</b>

The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report

was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

**Estimated Costs \***

	<b>Budgeted</b>	<b>Total To Date</b>	<b>Remaining</b>	<b>% Remaining</b>
<b>Extramural Costs</b>				
ERRS - Cleanup Contractor	\$225,000.00	\$2,400.00	\$222,600.00	98.93%
TAT/START	\$20,000.00	\$841.00	\$19,159.00	95.80%
<b>Intramural Costs</b>				
USEPA - Direct	\$14,000.00	\$2,000.00	\$12,000.00	85.71%
USEPA - InDirect	\$176,857.37	\$0.00	\$176,857.37	100.00%
<b>Total Site Costs</b>				
	\$435,857.37	\$5,241.00	\$430,616.37	98.80%

\* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

**2.5 Other Command Staff**

**2.5.1 Safety Officer**

Mike Firsick - Director of the Radiation Division at CT DEEP

Tony Honnellio, EPRB - Radiation Program & Safety Officer

**2.5.2 Liaison Officer**

N/A

**2.5.3 Information Officer**

N/A

**3. Participating Entities**

**3.1 Unified Command**

EPA-OSC

EPA-Radiation Program Contact

CTDEEP-Radiation Program Manager

**3.2 Cooperating Agencies**

**4. Personnel On Site**

EPA OSC Mike Barry

EPA OSC Natalie McClaine

EPA Health and Safety Officer Tony Honnellio

ERRS - Removal Manager

START - 1

Cabrera - Two Radiation Control Technicians (RCT)

CTDEEP Radiation Program - 2

**5. Definition of Terms**

N/A

**6. Additional sources of information**

**6.1 Internet location of additional information/report**

N/A

**6.2 Reporting Schedule**

N/A

**7. Situational Reference Materials**

N/A

POLREP #1 Last Updated 9/29/2016