U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
Oregon City Mercury Spill - Removal Polrep
Final Removal Polrep

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region X

Subject: **POLREP #3**
FINAL Polrep
Oregon City Mercury Spill

Oregon City, OR
Latitude: 45.3582359 Longitude: -122.6034892

To:
From: Jeffrey Fowlow, On-Scene Coordinator
Date: 6/3/2011
Reporting Period: April 19-May 11, 2011

1. Introduction

1.1 Background

Site Number:	10KH	**Contract Number:**	
D.O. Number:		**Action Memo Date:**	4/20/2011
Response Authority:	CERCLA	**Response Type:**	Emergency
Response Lead:	EPA	**Incident Category:**	Removal Action
NPL Status:	Non NPL	**Operable Unit:**	
Mobilization Date:	3/29/2011	**Start Date:**	3/29/2011
Demob Date:	5/11/2011	**Completion Date:**	5/11/2011
CERCLIS ID:	ORN 001002921	**RCRIS ID:**	
ERNS No.:		**State Notification:**	
FPN#:		**Reimbursable Account #:**	

1.1.1 Incident Category

Emergency Response and Removal Assessment

1.1.2 Site Description

On March 24, 2011, EPA received a report of a potential mercury spill in a driveway outside a vacant rental home in a historic residential area of Oregon City, Clackamas County, Oregon, a suburb of Portland. A prospective renter of the home who visited the property observed what appeared to be visible beads of mercury and called the Clackamas County Fire Department. The City of Gresham Hazmat Team #3 and Clackamas Fire Dept. responded to the incident and stabilized the site. During the response, the Operations Manager of Oregon City coordinated response efforts with Oregon Department of Environmental Quality (ODEQ) and the potentially responsible party (PRP), a non-resident homeowner who lives in Santa Fe, New Mexico. ODEQ also contacted the home owner, who then hired a contractor to respond to the site. Although the contractor later reported the mercury removed, Oregon City officials inspected the site, observed the presence of what appeared to be significant amounts of mercury on the ground, and reported this to ODEQ. On March 29, 2011, ODEQ reported that the cleanup was not complete, that mercury was still visible at the site, and requested EPA's assistance in assessing the site. EPA mobilized OSC Franklin and the EPA START-3 response contractors to the site on March 29-30 to conduct an investigation and site assessment.

1.1.2.1 Location

The site is located at 909 Washington Street, Oregon City, Clackamas County, Oregon. The spill site is located in a small, limited area at a house in a historic residential neighborhood, one of the oldest in Oregon, and is a short distance (less than 1/2 mile) from the Willamette River.

1.1.2.2 Description of Threat

There is a threat of exposure to mercury to the public from a spill of an unknown amount of mercury (initially estimated at 1 - 2 tablespoons) at the site. Mercury spilled onto soil and a driveway immediately adjacent to the house's detached garage, and areas outside the vacant house at this address. There are two storm drains at the site, one directly in the spill area and one in the adjacent alleyway. These drain to a city storm drain on Washington Street. Immediately adjacent to the site, and in very close proximity, is another

residence, which houses a family of six, including two adults and 4 children. The house and the adjacent neighbor's home is divided by a narrow, common city alleyway which also allows access to a church and church parking lot and neighboring homes to the rear or north/northwest. The mercury has migrated onto the neighbor's property and driveway (see below). Washington Street to the south is a moderately busy neighborhood thoroughfare in Oregon City. The primary threat is to the family living immediately adjacent to the spill, recent potential renters who have visited the property, persons from the adjacent church driving on/using the alleyway between the church parking lot and Washington Street, and vagrants or homeless persons who have been reported in the area and at the property.

1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

MARCH 30, 2011

On March 30, 2011, EPA conducted air monitoring at the site and adjacent property using two Lumex mercury vapor analyzers. Free beads of elemental mercury were observed over a wide area directly in front of the house's detached garage, but were concentrated in a distinct area approximately 4 foot by 4 foot in extent. Mercury vapors were detected along the ground south/southeast of the garage and near the northwest corner of the house at 1000 ng/m3. Mercury beads and vapors up to 1000 ng/m3 were also observed in the house's basement directly adjacent to a new boiler, and mercury vapors were detected in a nearby basement floor drain and one further away. Mercury was detected nowhere else in the basement or first floor of the house at concentrations greater than 100 ng/m3. Mercury vapors were also detected in only one location at low levels(100 ng/m3) on a walkway leading along the outside of the house from the basement door. No mercury vapors were detected along the other 3 sides of the house, or the house's backyard.

Along the alleyway and drive dividing the two homes, mercury vapor levels were observed to be from 100 to 200 ng/m3. No mercury vapors were detected in the front portion of the alleyway drive near Washington Street, or the sewer drain on Washington Street. Similarly, no mercury vapors were detected in a storm drain in the middle of the drive near the garage. None of the area of the drive or adjacent church parking lot beyond the rear of the property was evaluated, although mercury vapors were detected at low levels (100 ng/m3) on the drive at the property's rear edge.

On the concrete pad and driveway in front of the adjacent home's detached garage (911 Washington St.), mercury vapors were detected from the surface of the concrete and expansion joints from 400 to 6500 ng/m3. Mercury vapors inside this garage were detected along tire tracks at levels from 200 ng/m3 to 1200 ng/m3.

It is apparent that mercury contamination is localized in a relatively small area, and at the current time is not known to have migrated to other publlic areas. The local hazmat team has secured the site from further migration by placing a large tarp over the main area of concern and placed sandbags around it. The city also blockaded the rear access to the drive, and placed warning cones around the site. EPA also placed danger signed tape around the spill area.

APRIL 9 and 10, 2011

On Saturday, April 10, the EPA OSC was notified that the PRP was at the site conducting what sounded like an attempt to cleanup the site. The OSC was told that the PRP was "spreading a yellow powder" onto the driveway. One EPA OSC and two START contractors mobilized to the site location. After receiving Consent for Access from the 911 Washington Street homeowner (the Schweigers), START began conducting a survey with the Lumex MVA on the driveway of the 911 Washington Street home. Seven of the 34 locations surveyed by START were measured to have mercury contamination greater than 1,000 ng/m3, with a maximum concentration of 18,000 ng/m3. From the Schweiger property, the OSC could see a yellow powder (presumed to be sulfur) residue on the Roberts driveway and residue and footprints on the city-owned right-of-way (ROW). The START screened one of the footprints on the Schweiger property and the concentration of mercury detected with the Lumex was 9,000 ng/m3. Mr. Schweiger told me the footprint was caused by Mrs. Roberts walking through the contaminated area and onto the Schweiger property to speak. Yellow powder stained footprints and residue also were visible on the city ROW. START surveyed the ROW with the Lumex. Of the 11 locations surveyed, 7 locations had mercury contamination in excess of 1,000 ng/m3, with a maximum concentration of 20,000 ng/m3. The OSC called Mrs. Roberts who explained that she had attempted to decontaminate the property by spreading sulfur powder onto the pavement and scraping the residue up with a plastic dust pan. She performed this cycle of spreading sulfur and scraping with a dust pan 3 or 4 times, each time the scraped up residue was placed into a plastic 5-gallon bucket. The 5-gallon bucket of waste sulfur and mercury was then taken to a local waste transfer station. Mrs. Roberts stated she did not wear protective neoprene booties or any other standard personal protective equipment while she walked across the mercury contaminated surface while trying to scrape up the sulfur/mercury mixture. She admitted to the OSC that she walked from the most contaminated area directly across the city ROW and into her neighbor’s property to speak to him and that she tracked the contaminated sulfur onto his property. The OSC requested Mrs. Robert’s consent for access to her property to peel back the tarp which had been placed back over the contaminated area for the purpose of screening the area with our Lumex to determine the residual concentrations of mercury remaining on the driveway. Mrs. Roberts agreed to allow us access to perform the survey with the Lumex. Upon removal of the tarp, the asphalt driveway was revealed to be heavily stained by the sulfur powder. In the center of the tarped area, was a storm water drain covered with sandbags to prevent water and contaminants from entering the storm water discharge system. The EPA and START did not investigate the drain system because we did not want to allow any additional contaminants from entering the storm water system. The START used the Lumex to collect mercury vapor concentrations at 18 locations on the Roberts driveway. Of the 18 locations, one location was less than the ATSDR action level of 1,000 ng/m3, twelve locations had concentrations between 1,000 and 10,000 ng/m3, and five locations had concentrations between 10,000 ng/m3 and 55,000 ng/m3. There was one area with a sufficient number of mercury beads remaining as to be visible through the sulfur powder. After conducting the survey, the tarp was replaced and was weighted down with sand bags. It appeared that mercury contamination had spread over a larger area than was apparent from the March 30 investigation and the probable cause was the attempted cleanup conducted by the PRP.

On Sunday, April 10, Mrs. Roberts allowed EPA and START to enter the home in her presence to monitor the mercury contamiantion that had been observed in her basement in March by START and EPA responders. START, EPA, and Mrs. Roberts entered the basement and found that the new furnace was installed and operating and that sulfur had been spread in an area approximately 3 feet around the bottom of her furnace. The START conducted screening with the Lumex and found mercury readings were 300 ng/m3 or less. It is probable that the heat from the furnace operating closely over the spill area over a period of days had helped drive off the mercury observed previously detected in the basement.

The OSC informed Mrs. Roberts that she continued to have high levels of mercury contamination on her driveway with an area of large mercury beads still present, that her attempt to conduct cleanup had probably spread the contamination because she wasn't practicing contaminant control or decontamination, that she did not have the equipment necessary to monitor for health and safety nor measure the effectiveness of her cleanup, and that the contaminated properties were fully open and accessible to the public. The OSC informed Mrs. Roberts that the responsible choices were to hire a qualified and equipped contractor or allow access to EPA to conduct the cleanup. Mrs. Roberts told the OSC that she did not intend to sign the access agreement and that her intent was to conduct the cleanup herself. Mrs. Roberts was asked and she agreed to notify the OSC before she attempted any other cleanup activities.

2. Current Activities

2.1 Operations Section

2.1.1 Narrative

2.1.2 Response Actions to Date

On March 24, the Clackamas Fire Department and the City of Gresham Hazmat Team #3 responded to the site. The responders removed an unknown quantity of the mercury beads, placed them in a 5-gallon bucket, and left them on site.

The PRP hired IRS Environmental who removed the bucket and disposed of it. It does not appear any additional removal of mercury was conducted by IRS Environmental.

On April 9, the PRP attempted to remove mercury by spreading sulfur powder onto the driveway and scraping it up with a dust pan. A 5-gallon bucket of mercury-contaminated sulfur was generated and disposed of at a Clackamas County Waste Transfer Station.

On April 12, the PRP attempted removal of mercury by spreading sulfur powder on the driveway and then using a weed torch to burn the powder and mercury. It is unknown how much mercury had been volatilized into the atmosphere. The OSC had not notified prior to beginning this activity and, as a consequence, there was no air monitoring on site while the operation was being conducted.

On Tuesday, April 12, EPA sought and received a warrant from a magistrate judge to conduct the necessary cleanup activities at the PRP's property. On Wednesday, April 13, EPA ERRS contractors began removal of mercury from the asphalt driveway on the PRP's property. Free mercury beads were first removed using a mercury vacuum. When all free mercury was removed, dozens of tiny, pin-head sized beads remained in the asphalt that could not be removed by vacuum. ERRS also used a weed torch to create a monitored burn and help volatilize the mercury and a commercially-available mercury vapor reduction solution (HgX). In test areas, the results of these alternate removal solutions were mostly inconsistent. In some cases, concentrations of mercury were reduced, in other areas, they were not. In some cases, even after using the weed torch or the HgX solution, visible mercury beads were still present. The weather also made using burning or solutions less reliable because it was cold (45 degrees) and raining most of the day. The cold and the rain inhibited the effectiveness of the HgX solution and burning because temperatures could not be elevated sufficiently to enhance volatilization and the rain seemed to dilute the HgX solution. Because the mercury beads continued to present a risk to people walking across the driveway and tracking the mercury in their shoes or tires, the OSC directed the ERRS to remove the entire heavily contaminated asphalt driveway overcoat down to the concrete original driveway. Approximately 5 cubic yards of asphalt were removed and placed in a lined roll off box.

The drain, sump box, and grate cover on the Roberts property driveway were screened with the Lumex and concentrations of mercury were found at 45,000 ng/m3. These items were placed in a drum with the contents of the mercury vacuum (elemental mercury, highly contaminated sulfur residue, vacuum filters) for disposal as a separate waste stream.

EPA also received access to the city ROW to conduct removal of contaminated asphalt. Because the asphalt had high levels of contamination and the attempt to remove mercury from the Roberts driveway turned out to be inconsistent and ineffective, the OSC directed the ERRS to remove all portions of the asphalt that had previously found to be contaminated. The ERRS used a backhoe and loader to remove approximately 3 yards of contaminated asphalt. This asphalt was placed in the same lined roll off box as the asphalt from the Roberts driveway.

EPA attempted to conduct decontamination of the concrete driveway on the Schweiger property. The slabs and expansion joints were thoroughly vacuumed with the mercury vacuum. The driveway was warmed up using the weed torch and 2 applications of HgX were applied. Mercury concentrations were still high (as high as 37,000 ng/m3 in one location), however, no beads of mercury were ever observed on the Schweiger property. The OSC presented survey data to Mr. and Mrs. Schweiger who elected to not have their driveway removed at this time. They expressed a desire to wait until after the results of future monitoring (planned for the week of April 17-23 when more favorable weather conditions are forecasted) are known to discuss whether portions of their driveway need to be removed.

2.1.2.1 Response Actions This Reporting Period (April 19-May 11, 2011)

APRIL 19, 2011

START and EPA returned to the site to screen the Schweiger, City ROW, and Roberts properties. The weather in Oregon City from April 15-19 had been warmer and drier than the previous week and the purpose of the re-screening was to determine whether residual mercury was present at high concentrations.

The Schweiger property was screened at approximately 75 locations. At approximately 45 of those locations, the concentrations were less than 1,000 ng/m3. At the 30 locations that were greater than 1,000 ng/m3, none were greater than 10,000 ng/m3. The highest concentration encountered was 7,300 ng/m3. In general, the concentrations were greatly reduced from the previous week.

The City ROW was screened at approximately 60 locations. At approximately 24 locations, the concentrations exceeded 1,000 ng/m3, but none were greater than 10,000 ng/m3. The highest concentration in the City ROW was 5,700 ng/m3.

The Roberts property was screened at approximately 100 locations. At 25 locations, the concentrations were less than 1,000 ng/m3. At approximately 60 locations, the concentrations were between 1,000 and 10,000 ng/m3. At 16 locations, the concentrations were greater than 10,000 ng/m3. O those 16 locations, 5 were greater than 20,000 ng/m3 and the highest concentration encountered was 30,000 ng/m3. In general, the highest concentrations remained where areas of the asphalt driveway surface remained on the west side of the driveway and along the cracks in the original concrete driveway in front of the garage. Based on the results of the survey, EPA decided to re-mobilize and remove the contaminated asphalt and concrete on the Roberts property and to continue to treat areas on the Schweiger and City properties.

MAY 2-4, 2011

EPA, START, and ERRS with the intent of re-surveying and treating the Schweiger property, if necessary, and removing contaminated materials from the Roberts property.

START surveyed the Schweiger driveway with the Lumex. Only 2 or the 30 locations screened had mercury concentrations in excess of 1,000 ng/m3 with the highest concentration at 1,600 ng/m3. EPA determined that no additional treatment was necessary on the Schweiger property.

On the Roberts property, ERRS gently swept loose dust from the concrete driveway and placed the dust into a polyethylene drum liner. START monitored dust levels during the sweeping to ensure that our activities did not generate a dust plume. START screened the 2 bags of dust and debris from the driveway and the concentrations of mercury were 55,000 and 18,000 ng/m3. After the the dust was removed, ERRS applied a concrete sealant to try to hold any mercury beads or dust while the concrete slab was being removed and placed into a roll off bin. By May 3, the concrete driveway had been removed and START screened the exposed soil beneath where the fractured concrete driveway had been. START collected approximately 50 measurements and found that 8 locations had concentration inexcess of 1,000 ng/m3 with the highest concentration being 12,000ng/m3. The areas of highest contamination were concentrated where the drainbox remained and where the concrete fractures were most prevalent. Headspace analysis of soil samples were as high as 50,000 ng/m3. EPA directed ERRS to remove the damaged drain box and all areas of soil in excess of 1,000 ng/m3. After ERRS removed the soil known to be contamiated (approximately 1-2 cubic yards), START re-surveyed the exposed soil and all concentrations were below 1,000 ng/m3. All known areas of significant mercury contamination were now removed. The final roll off bin was removed from site on May 9 and sent to the Waste Management in Arlington, Oregon.

On May 4, Oregon City public works officials conducted a video survey of the storm water line, and cleaned and performed some minor repairs to the system. The city requested an asphalt surface tp be placed over the ROW as restoration. ERRS purchased and installed a new drain box in the Roberts driveway and connected it to the city storm water system. The drain box was placed on concrete for stability and all connections were sealed with joint cement. Approximately 5 cubic yards of crushed rock was distibuted, compacted with a plate compactor, and sculpted to enhance drainage to the drain box or the city ROW drain. The sculpting was checked using a string line level to ensure water would drain appropriately.

MAY 10-11, 2011

On May 10, ERRS completed all site work in preparation for asphalt paving. An Oregon City official inspected the preparation work and, after some additional modifications, confirmed the site was ready for paving. The paving was completed on both the Roberts and ROW. Prior to paving, a heavy roller was used to compact the driveway and ROW. A tar adhesive was applied where new asphalt was going to be in contact with concrete. Asphalt was hand poured, spread with a rake, and compacted with a plate compactor, followed by a heavy roller. While compaction was ongoing, slope was continuouisly checked with a 4' level to ensure proper drainage toward the drains. Once the new surface ws completely compacted and smoothed, drainage was checked by running water over the surface with a garden hose. Finally, a liquid epoxy was applied at all joints to prevent water seepage. All work on Roberts property was concluded on May 10.

On May 11, ERRS and a subcontractor completed a small repair on some asphalt that had split away from the city ROW by a neighbors fence. The damage appeared to have been caused by the heavy equipment used by EPA contractors. All field work assosciated with this project has been completed.

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

The property owner and PRP is a Mrs. Nancy Roberts of Santa Fe, NM.

Progress Metrics

Waste Stream	*Medium*	*Quantity*	*Manifest #*	*Treatment*	*Disposal*
D009/UN3077 Env. Hazardous Substance, mercury debris	**Debris**	**1 Drum**	**000022501DAT**		**Landfill**
Not regulated by DOT (Mercury Contaminated Debris)	**Debris**	**8 Cubic Yards**	**002702643JJK**		**Landfill (pending analysis)**
Not regulated by DOT (Mercury Contaminatd Debris)	**Debris**	**~10 Cubic Yards**	**TBD**		**Landfill (pending analyysis)**

2.2 Planning Section

2.2.1 Anticipated Activities

2.2.1.1 Planned Response Activities
The current removal action is complete.

2.2.1.2 Next Steps

2.2.2 Issues

2.3 Logistics Section
No information available at this time.

2.4 Finance Section
No information available at this time.

2.5 Other Command Staff
2.5.1 Safety Officer

2.6 Liaison Officer

2.7 Information Officer

2.7.1 Public Information Officer
A Public Information Officer (Tony Brown) has been assigned. A reporter for the Oregonian interviewed OSCs Richard Franklin and Jeffrey Fowlow, EPA attorney Jennifer MacDonald, DOJ attorney Neil Evans, as well as Mrs. Roberts, the Schweiger family, and Oregon City officials. The resultant story was published in the Oregonian on May 21, 2011.

2.7.2 Community Involvement Coordinator
A Community Involvement Coordinator (Dan Phalen) has been assigned. A mercury fact sheet was prepared and made available at the site. OSC Richard Franklin went door-to-door to several of the neighborhood homes and talked to area residents about the removal projects. Two nearby residents stopped by the command post to speak to the OSC. The OSC maintained contact with ODEQ and city officials keeping them informed of progress.

3. Participating Entities
3.1 Unified Command

3.2 Cooperating Agencies
Clackamas County Fire and Gresham Hazmat performed initial identification and containment activities. ODEQ officials also provided expertise and assistance especially in the initial identification of the site. Oregon City has agreed to restore the pavement surface on the ROW.

4. Personnel On Site
EPA OSC Jeffrey Fowlow
EPA OSC Richard Franklin
2 START contractors
3 ERRS contractors
ERRS subcontractors (paving)

5. Definition of Terms
No information available at this time.

6. Additional sources of information
No information available at this time.

7. Situational Reference Materials
No information available at this time.