



## ecology and environment, inc.

Global Environmental Specialists

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720 Third Avenue, Suite 1700  
Seattle, Washington 98104  
Tel: (206) 624-9537, Fax: (206) 621-9832

October 7, 2013

Kathy Parker, On-Scene Coordinator  
United States Environmental Protection Agency  
1200 Sixth Avenue, Mail Stop ECL-116  
Seattle, Washington 98101

Re: Final Trip Report for the Yakima Pipe Bomb Mercury Site  
Contract Number EP-S7-13-07, Technical Direction Document Number 13-08-0010

Dear Ms. Parker:

Enclosed please find the final Trip Report for the Yakima Pipe Bomb Mercury Site which is located in Yakima, Washington. If you have any question regarding this submittal, please call Renee Nordeen or me at (206) 624-9537.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Brad Martin  
START-4 Emergency Response Team Leader

cc: Renee Nordeen, START-4 Project Manager, E & E, Seattle, WA

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**FINAL TRIP REPORT**

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**Yakima Pipe Bomb Mercury Site**

**Yakima, Washington**

**TDD: 13-08-0010**



Prepared for

U.S. Environmental Protection Agency, Region 10  
1200 Sixth Avenue  
Seattle, Washington 98101

Prepared by

Ecology and Environment, Inc.  
720 Third Avenue, Suite 1700  
Seattle, Washington 98104

October 2013

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## **Executive Summary**

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of an emergency response at the Yakima Pipe Bomb Mercury Site, located in an alley behind 106 South 11<sup>th</sup> Avenue, Yakima, Yakima County, Washington. E & E completed the removal assessment activities under Technical Direction Document Number 13-08-0010, which was issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START; contract number EP-S7-13-07).

On August 2, 2013, On-Scene Coordinator Kathy Parker and three START members mobilized to Yakima, Washington, to conduct a mercury emergency response at the Yakima Pipe Bomb Mercury Site. Prior to arrival on-scene, a release of an unknown amount of elemental mercury occurred after the intentional detonation of a suspected bomb placed at the site. The mercury was dispersed into very small, but visible beads over an area estimated to be approximately 400 square feet. During the assessment, the right-of-way access north and south of the alley was screened for the presence of mercury via visual identification and mercury vapor using two Lumex Mercury Vapor Analyzers and a Jerome Mercury Vapor Analyzer. Mercury vapor was detected approximately 1,000 feet north and up to 2,000 feet south of the exclusion zone above background levels in vapor; however, the detection of mercury vapors was dependent on increasing temperatures observed as the day progressed and prior to application of the sealants used to mitigate the vaporization of the mercury.

At the request of EPA, ERRS was contracted to provide an asphalt sealing crew who utilized a cold asphalt sealant to cover the impacted area. In addition, a concrete sealant was applied to the sidewalk adjacent to the detonation point and the asphalt alleyway. After the sealants were permitted a drying time, additional monitoring was conducted in the area, it was determined the mitigation measures undertaken had reduced the mercury vapor to concentrations well below the established site-specific action level of 3,000 nanograms per cubic meter and EPA decided that no further action was required at the Yakima Pipe Bomb Mercury Site.

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## 1. PLACE VISITED

**Site Name:** Yakima Pipe Bomb Mercury Site  
**Owner Name:** David A. Thorner  
**Location:** 106 South 12<sup>th</sup> Street Yakima, Washington, 98907  
**SSID:** 10ML  
**CERCLIS ID:** WAN001003144  
**Latitude:** 46.596181  
**Longitude:** -120.524323  
**Dates of Response:** August 2–3, 2013

## 2. PURPOSE

The United States Environmental Protection Agency (EPA) has tasked Ecology and Environment, Inc. (E & E), under Superfund Technical Assessment and Response Team (START)-4 contract number EP -S7-13-07, Technical Direction Document number 13-08-0010, to conduct an emergency response at the Yakima Pipe Bomb Mercury Site and to analyze the extent of any released mercury or related material in order to provide technical assistance to the EPA. START was also tasked to record site conditions through logbook entries and photographic documentation. Attachment A contains photographs taken at the Yakima Pipe Bomb Mercury Site.

The purpose of the Yakima Pipe Bomb Mercury Site emergency response action was to collect facts relating to a mercury release into the environment and to assess the potential threat of human exposure to mercury and/or mercury vapor in the area of the release.

## 3. PERSONS INVOLVED

Agency/Company	Contact Persons/ Position	Phone Number
U.S. Environmental Protection Agency	Kathy Parker – On-Scene Coordinator	(206) 553-0062
Ecology and Environment, Inc.	Renee Nordeen – Project Manager/Responder	(206) 624-9537
	Eric Lindeman – Site Safety Officer/Responder	(206) 624-9537
	Chris Whitehead – Responder	(206) 624-9537
Washington State Department of Ecology	Samuel Hunn	(509) 575-2806
	Mark Peterschmidt	(509) 454-7843
Environmental Quality Management Technologies and Energy, Inc.	Jerry Wade – Removal Manager	(425) 673-2900

## **4. BACKGROUND**

On August 2, 2013, the EPA Emergency Management Program (EMP) mobilized START for an emergency removal action in response to a release of a hazardous substance after the intentional detonation of a suspected bomb. The detonation of the suspected bomb resulted in a release of elemental mercury onto an adjacent parking lot asphalt and aggregate concrete sidewalk. The mercury was dispersed into very small, but visible beads over an area estimated to be approximately 400 square feet. Access to the area was restricted from West Chestnut Avenue to approximately 50 feet south of the detonation point.

The site consisted of a parking lot and associated sidewalk section in an alley behind a church located at 106 South 11<sup>th</sup> Street in Yakima, Washington. The primary land use in the area is commercial and residential. The alley is located between 10<sup>th</sup> and 11<sup>th</sup> Streets at the intersection of West Chestnut Avenue. The residential properties are located across the alley from the detonation point and along 11<sup>th</sup> Street and consist of multi-family residential structures. See Figure 1 for the site map.

## **5. ACTIVITIES**

At 1540 on August 2, 2013, Federal On-Scene Coordinator (OSC) Kathy Parker and three members of START arrived at the site. OSC Parker made contact with Washington State Department of Ecology responder Mark Peterschmidt to assess conditions at the site. Mr. Peterschmidt stated that an unknown amount of mercury had been released after an intentional detonation of a suspected bomb and that City of Yakima services had maintained closure of the alley after law enforcement departed the scene.

Upon arrival, START began site characterization of the exclusion zone to determine the extent of mercury contamination using a Lumex Mercury Vapor Analyzer (MVA) and Jerome MVA to monitor ambient air concentrations between ground surface and the adult breathing zone. Readings noted outside the exclusion zone and upwind of the site using the Lumex MVA were noted to fluctuate between 500 and 1,000 nanograms per cubic meter (ng/m<sup>3</sup>). The exclusion zone at this time was defined as the intersection of the alley with West Chestnut Street south to the southern boundary of the detonation point. In the exclusion zone, the Lumex MVA detected mercury vapor concentrations in excess of 30,000 ng/m<sup>3</sup> at the ground surface. Although, bulk mercury was not observed at all points measured in the exclusion zone while monitoring, visible beaded mercury was observed in the immediate area of the detonation point.

The Agency for Toxic Substances and Disease Registry (ATSDR) Residential Occupancy Level (ROL) for mercury is 1,000 ng/m<sup>3</sup>, and the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL) Time Weighted Average (TWA) is 10,000 ng/m<sup>3</sup>. No guidance is available for mercury concentrations on exterior asphalt or concrete surfaces. As such, OSC Parker established a conservative action level of three times the Residential Limit (3,000 ng/m<sup>3</sup>).

Based on the elevated readings noted over a broad area, Yakima Public Works were requested to seal the mercury in place within the exclusion zone. Yakima city services arrived at approximately 1800 to place a layer of hot asphalt over a 400 square foot section of the parking area, including the concrete parking stops. START transferred the beaded mercury using coarse bristle brushes from the sidewalk area directly adjoining the detonation point to the asphalt driveway to be sealed. Additionally, upon further investigation of the sidewalk area adjoining the detonation point, beaded mercury was observed to have collected in the interstitial space between the sidewalk and the lawn to the west of the exclusion zone. Once the asphalt sealant was laid, OSC Parker and START departed the site to continue assessment activities the following day. Based on the readings of the field instrumentation, the exclusion zone was readjusted to extend approximately 100 feet north of the site; however, due to the elevated temperatures



noted in the late afternoon, approximately 85 degrees Fahrenheit, mercury vapors were detected at least 250 feet downwind (south) of the site.

At 0800, on August 3, 2013, OSC Parker and START arrived on-scene to determine if any mercury contamination remained at the site above the site action level of  $3,000 \text{ ng/m}^3$ . Beginning at Spruce Street which is approximately 500 feet south of the detonation location, air monitoring was conducted with one Lumex MVA. The vapor readings were less than  $1,000 \text{ ng/m}^3$  until reaching the southern extent of the extended exclusion zone. Once inside the exclusion zone, the Lumex readings were greater than  $30,000 \text{ ng/m}^3$ . START removed soils containing beaded mercury from the interstitial space between the sidewalk at the detonation point and the lawn to the west and placed them in a lined five-gallon bucket. This reduced mercury vapors detected in air and cleared the exclusion zone for further mitigation activities.

Emergency and Rapid Response Services (ERRS) contractors were contacted to provide an asphalt sealing crew who utilized a cold asphalt slurry to seal the remainder of the exclusion zone. In addition, a concrete sealant was applied to the aggregate sidewalk adjacent to the detonation point as well as to the alleyway entrance from West Chestnut. The sealants were allowed to cure in place for approximately an hour and additional monitoring data was collected. Monitoring data was collected by approaching downwind of the process and recording measurements in approximately 20 foot increments at level surface with a funnel placed over the sampling inlet to isolate each sampling point. These results indicated that mercury vapors had decreased by at least an order of magnitude below the original values ranging from  $3,000 \text{ ng/m}^3$  to background. After all sealants were applied and START confirmed that mercury vapors did not exceed the site action level, ERRS collected the mercury-containing soils for disposal at a household hazardous waste facility and departed the site. After Ecology and EPA relinquished site control back to the property owner, OSC Parker and START departed the site.

## **6. SUMMARY AND CONCLUSIONS**

EPA and START responded to the Yakima Pipe Bomb Mercury Site after receiving a report that a mercury release occurred after the intentional detonation of a suspected bomb. START assessed the exclusion zone and vicinity, relying primarily on the Lumex MVA for air monitoring. The Jerome MVA was used as a backup air monitor. Based on airborne mercury concentration readings from the Lumex, the exclusion zone was adjusted to an approximate 350 feet of alley centered on the detonation point. Mercury vapor readings from the Lumex were elevated inside this area; however, application of an asphalt and epoxy sealant to the exclusion zone reduced mercury vapor concentrations to below the site clearance level of  $3,000 \text{ ng/m}^3$ .

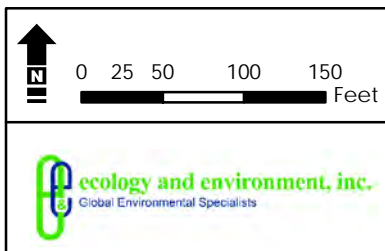
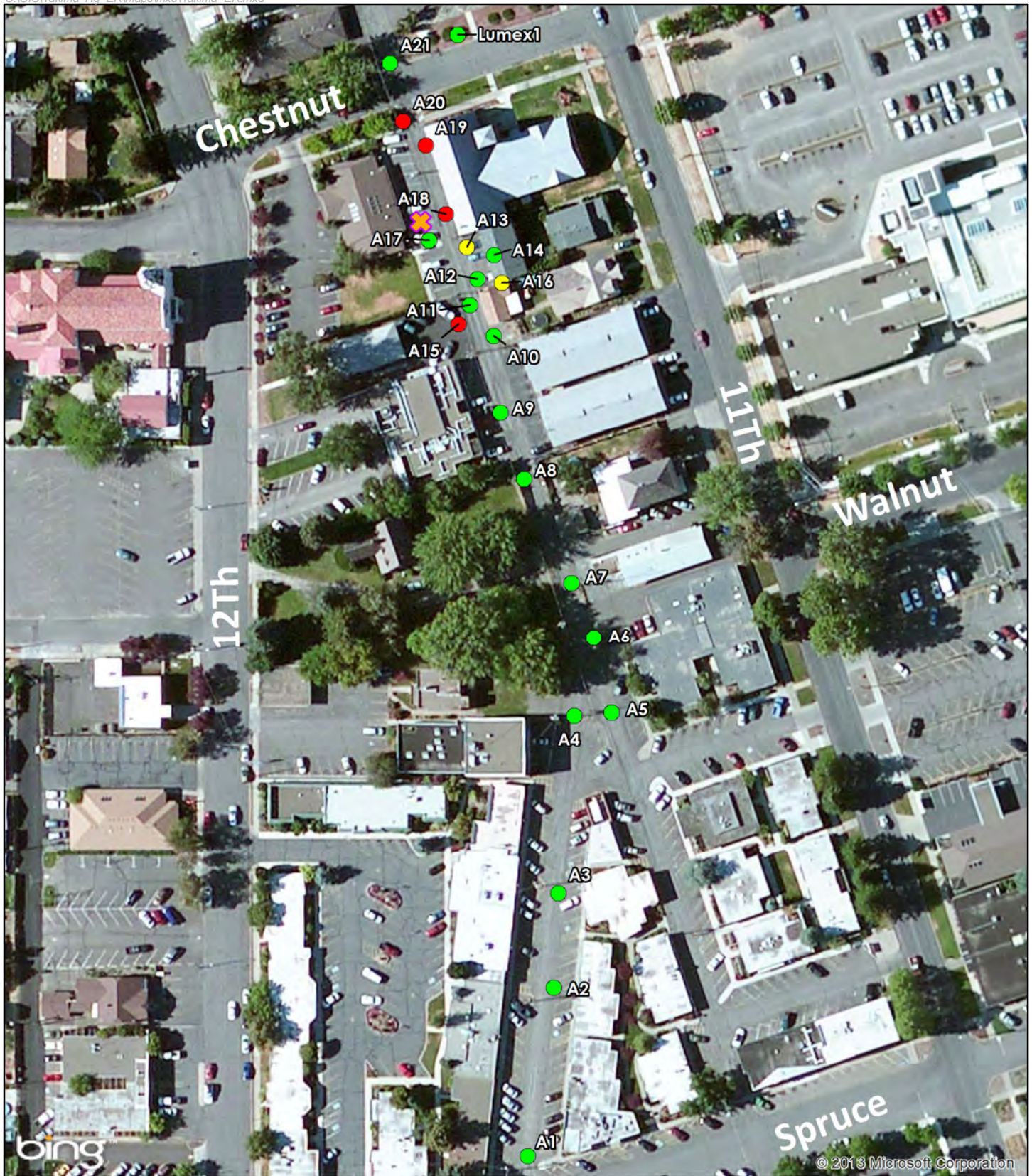


Figure 1  
Yakima Pipe Bombs Mercury Spill  
Lumex Monitoring Results  
August 2013

Mercury Monitoring Results

- < 3,000 ng/m<sup>3</sup>
- 3,000 - 10,000 ng/m<sup>3</sup>
- > 10,000 ng/m<sup>3</sup>
- ✱ Detonation Point

## **ATTACHMENT A**

### **Photographic Documentation**

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YAKIMA PIPE BOMB MERCURY RESPONSE  
Yakima, Washington



Photo 1 View of the church located at 101 South 11th Street Yakima, Washington.

Direction: South Date: 8/2/13 Time: 16:41 Taken by: CW

TDD Number: 13-08-0010  
Photographed by: Chris Whitehead (CW), Kathy Parker - EPA (KP)



Photo 2 START using the Lumex and Jerome to assess contamination in the exclusion zone

Direction: Southeast Date: 8/2/13 Time: 17:00 Taken by: KP



Photo 3 Paint showing area of visible mercury beads in the parking lot.

Direction: South Date: 8/2/13 Time: 17:33 Taken by: KP



YAKIMA PIPE BOMB MERCURY RESPONSE  
Yakima, Washington

TDD Number: 13-08-0010

Photographed by: Chris Whitehead (CW), Kathy Parker - EPA (KP)



Photo 4 City of Yakima workers applying slurry sealant in parking lot.

Direction: South Date: 8/2/13 Time: 19:05 Taken by: KP



Photo 5 View of the burnt bush located north of the church which initiated the response.

Direction: East Date: 8/2/13 Time: 19:31 Taken by: CW



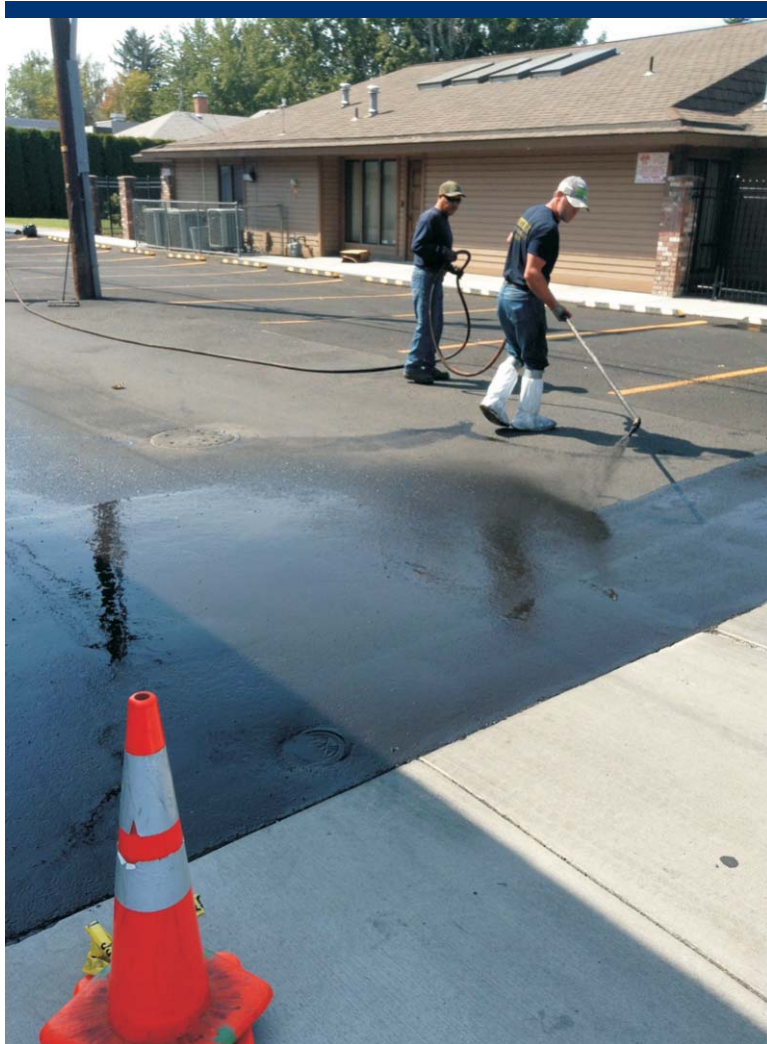


Photo 6 ERRS applying the cold asphalt sealant being applied to the extent of the exclusion zone.

Direction: South Date: 8/3/13 Time: 11:16 Taken by: CW

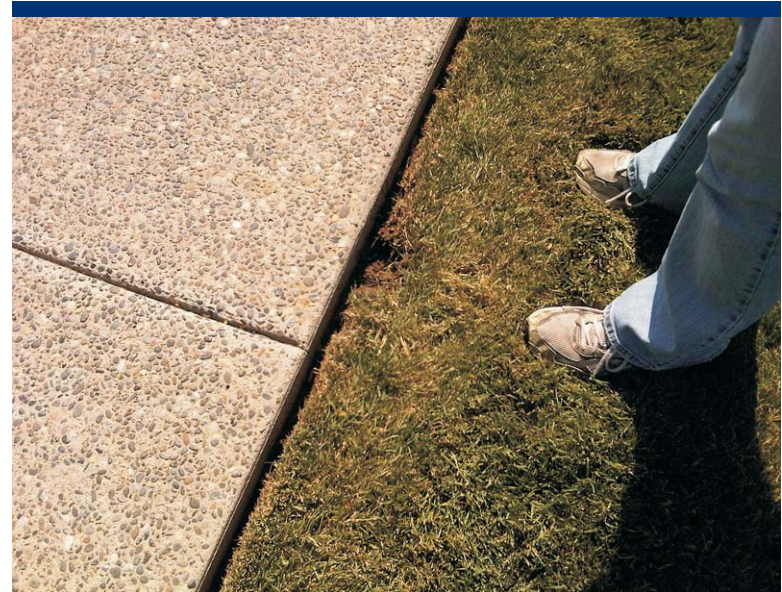


Photo 7 Area of visible mercury beads interstitial space between the sidewalk and the lawn.

Direction: Down Date: 8/3/13 Time: 11:36 Taken by: KP

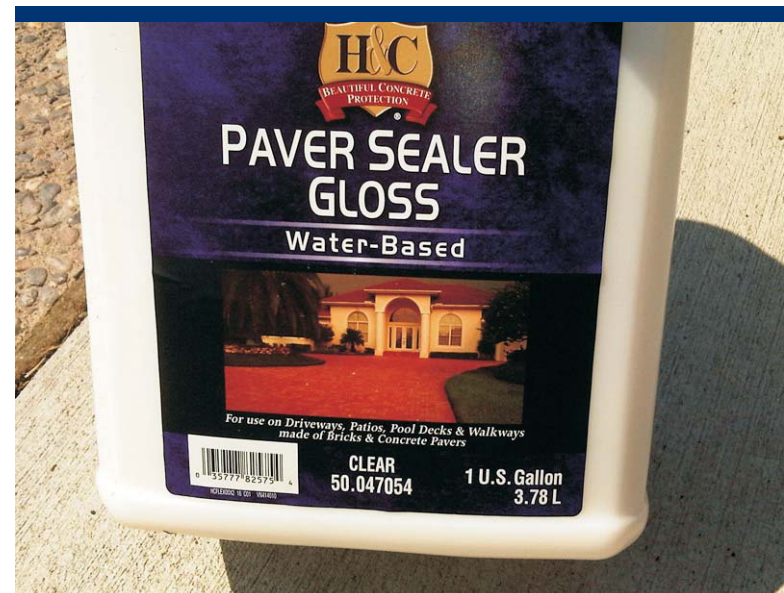


Photo 8 Concrete sealant used on sidewalk.

Direction: Down Date: 8/3/13 Time: 12:00 Taken by: KP





Photo 9 Application of sealant on sidewalk.

*Direction: South      Date: 8/3/13      Time: 12:01      Taken by: KP*



Photo 10 START using Lumex to assess contamination after sealant has been applied.

*Direction: Down      Date: 8/3/13      Time: 12:02      Taken by: KP*



Photo 11 Application of concrete sealant on public sidewalk.

*Direction: Southwest      Date: 8/3/13      Time: 12:16      Taken by: KP*





Photo 12 View of the applied cold asphalt sealant on the southern portion of the exclusion zone.

Direction: East Date: 8/3/13 Time: 12:40 Taken by: CW

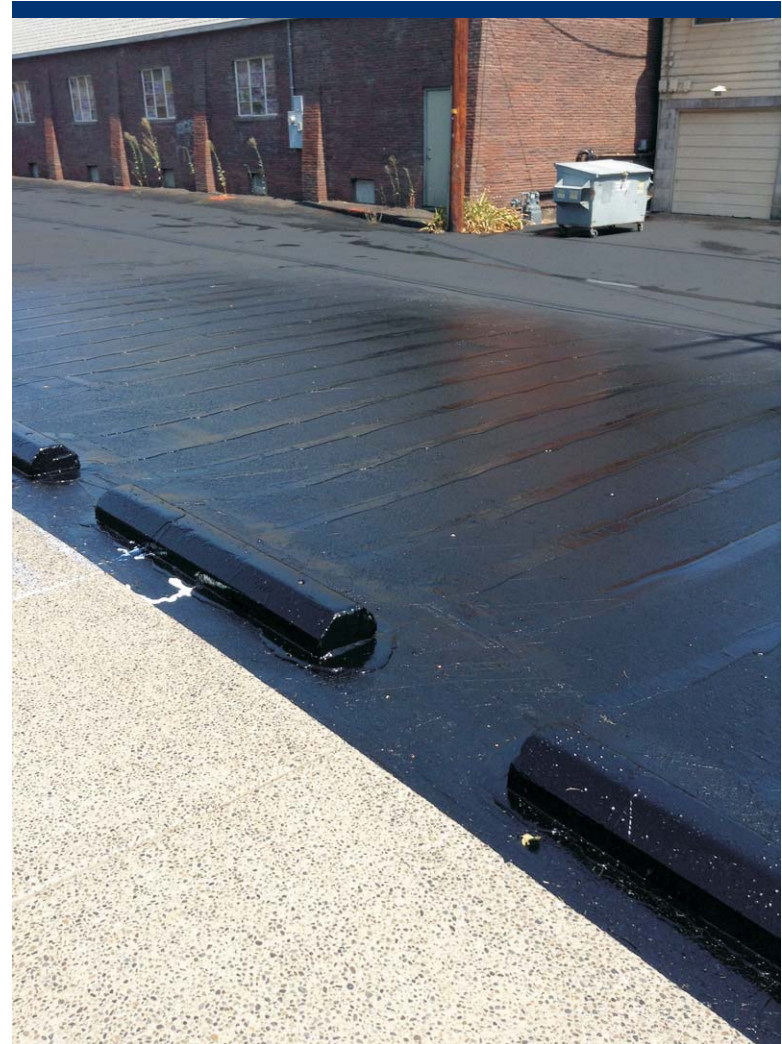


Photo 13 City of Yakima crew applying the hot asphalt treatment adjoining the detonation point; the highest readings were detected in this area.

Direction: East Date: 8/3/13 Time: 12:41 Taken by: CW





Photo 14 View of the slurry sealant applied to the sidewalk section at the detonation point.

*Direction: North      Date: 8/3/13      Time: 12:41      Taken by: CW*



Photo 15 View along the length of the exclusion zone behind the church.

*Direction: Southeast      Date: 8/3/13      Time: 12:42      Taken by: CW*