

# ELEMENTAL MERCURY AWARENESS AND RESPONSE

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THIS IS YOUR HOUSE



THIS IS YOUR HOUSE  
ON MERCURY



DON'T MESS WITH MERCURY!

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THIS IS YOUR SCHOOL



THIS IS YOUR SCHOOL  
ON MERCURY



DON'T MESS WITH MERCURY!

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# QUESTION 1

- What are the three forms of mercury?

## ANSWER

- Elemental
- Organic (methyl mercury)
- Inorganic (mercuric salts)

## ELEMENTAL MERCURY PROPERTIES:

- Mercury vapors are invisible
- Vaporizes at room temp. and higher
- Mercury is insoluble
- Vapor pressure is  $<0.0012$  mmHg
- Vapors are odorless
- Vapors are tasteless
- Sp. gravity = 13.6 (water=1; lead= 11.3)

## Mercury in a Jar Video (1 min, 3.5 MB)

- <http://www.epaossc.org/sites/5538/files/Mercury%20in%20a%20jar%20demo.wmv>



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Broken Thermometer  
Video (42 sec, 5 MB)

<http://www.epaosc.org/sites/5538/files/Broken%20thermometer%20demo.wmv>



Mercury Vapor After  
Carpet Cleanup Video  
(49 sec, 988KB)

<http://www.epaosc.org/sites/5538/files/carpetmercury.wmv>



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## QUESTION 2

- How much elemental mercury needs to be spilled before it poses enough of a problem to justify a response?



# ANSWER

- It depends

## Depends on:

- Location of spill
- Type of surface spilled on
- One droplet or many
- Temperature
- Length of time
- Who is being exposed
- How the initial cleanup was conducted
- Many other factors

## QUESTION 3

- What is the regulated quantity (RQ) for elemental mercury which triggers the legal requirement for the spiller to call the national response center (NRC)?

# ANSWER

- One pound

## QUESTION 4

- At what temperature does mercury begin to volatilize?

# ANSWER

- -38 degrees Fahrenheit  
(yes – that is a negative sign)

## QUESTION 5

- If a thermostat was broke in a house and the mercury was not cleaned up, approximately how long would it take for the mercury to completely volatilize into the atmosphere?

## ANSWER

- It depends – mainly on surface area
- One drop – around one year
- 1000 drops – around a month
- 10,000 drops – around two weeks



## QUESTION 6

- If an elemental mercury spill is immediately cleaned up using a household vacuum, will it really pose a health threat?

## ANSWER

- It depends – most likely it will as this is one of the worst things you can do – creates many small beads which increases surface area and causes more mercury vapors in the area
- also trans-locates mercury to where ever the vacuum is used next

## QUESTION 7

- Can you properly declare a mercury spill area “clean” based on a visual inspection?

## ANSWER

- No – mercury beads will always find their way to the lowest point (in cracks, floor drains, sub-floors, etc..) where it can't be seen with the naked eye
- Air monitoring/sampling is the only true way to determine if all elemental mercury has been recovered

## QUESTION 8

- What is more harmful, swallowing elemental mercury, absorbing it through your skin, or inhaling it?

# ANSWER

- Inhaling

there is always an exception to the rule:

- could be ingestion
- could be absorption

## QUESTION 9

- Can water be used as a permanent seal on top of mercury to keep vapors from entering the atmosphere?

## ANSWER

- It depends – but probably not since mercury vapors are very soluble
- If you have mercury in the bottom of a jar with water on top and no lid – the water will become completely saturated with mercury vapors within a couple of days and breakthrough will begin



## QUESTION 10

- What is the proper way to test a person for mercury poisoning?

# ANSWER

- It depends

## Depends on:

- How long has it been since the subject was exposed to the mercury
- If less than 24 hours, a blood test will work
- If more than 24 hours, a 24-hour urine sample is the most accurate
- Hair samples are generally cost prohibitive and is a better indicator for organic mercury exposure

## QUESTION 11

- What all devices/products contain elemental mercury?

# ANSWER

(this is only a very small list of what is out there)

- Thermometers
- Thermostats
- Sphygmomanometers
- Fluorescent bulbs
- Dental amalgams
- Batteries
- Barometers
- Gas regulators
- Heat generators
- Carburetor gauges
- Pressure gauges
- Jewelry
- Children's shoes
- Automobile switches
- Paint
- Gold mining
- Fungicides
- Antique clocks

## Beneficial Use Properties

- Clocks, ballasts, medical devices:  
**Liquid weight/density**
- Thermostats, tilt switches:  
**Electric conductivity**
- Barometers, sphygmomanometers:  
**Known pressure sensitivity**
- Fungicide, preservative:  
**Extreme toxicity**

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# RESPONSE

- Isolate
- Interview/Interrogate
- Investigate (don't be a "tracker")
- Bulk Recovery – focused ventilation

## EPA Response

- Referral – usually local or state health; get access agreement signed
- Reconnaissance – visual and air monitoring; don't be a tracker; don't fry the instrument near visual beads
- Relocation – use guidance; screen items taken out of home to temp. housing;



## EPA Response (cont.)

- Removal – Action Memo; pre-decon documentation; bulk mercury recovery; decon of personal items; decon of structure; heat/vent; disposal; post sample
- Replacement/Reimbursement/Restoration follow guidance; documentation; 3<sup>rd</sup> party appraisal; cost recovery letter
- Reoccupation – de-list letter from EPA and health department; final sign off document

# Missouri

- MDNR (573-634-2436)
  - 2 VM3000 (Trackers) (one in Jefferson City and one in Springfield)
  - Jerome (Jefferson City)
  - Mercury Vacuum (Jefferson City)
  - Elemental mercury collection container (Jefferson City)
  - Mercury Spill kits in all six regions

# Kansas

## KDHE

- Jerome MVA and Mercury Vacuum in Topeka
- Jerome MVA in Dodge City
- (785)296-1679 [duty officer]

## Kansas State Fire Marshal

- 2 Lumex Lt MVAs: Topeka and Dodge City
- (866)542-9628 [Dan Thompson]

## Wichita Dept of Environmental Health

- Lumex Lt MVA in Wichita
- (316)268-8351 [Curtis Redington]

## Overland Park HazMat

- Lumex Lt MVA in Johnson County
- (913)895-8301 [Hank Dupont]

# Nebraska

- Nebraska Health and Human Services (NHHS 402-326-0231)
  - 24 hour mercury hotline
  - Lumex and Jerome in Lincoln/Omaha area
  - Mercury bucket disposal project

# Iowa

- IDNR (515-281-8694)
  - 1 Lumex Lt with Des Moines Hazmat
  - 1 Lumex Lt with Mason City Hazmat
  - 1 Lumex Lt with Iowa City Hazmat
  - 1 Lumex Lt with Sioux City Hazmat
  - 1 Bacharach in Iowa City (UHL)

## EPA Region 7

- 4 Lumex units (two with solid and liquid attachments), 2 Jerome units, 2 exhaust fans in KC;
- 1 Lumex, 1 Jerome, 2 fan in St. Louis
- 1 Mercury vacuum in KC and 1 in St. Louis
- 8 hour sampling pumps/hopcalite tubes/both
- Several mercury spill kits and various cleanup supplies
  
- Try to make industry do their own, will respond to most spills where assistance is needed
  
- R7 24 hr (913)281-0991
- NRC 24 hr (800)424-8802

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# Thank You

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please complete our online feedback form.



**Thank You**

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