Meth Lab Cleanup

A Public Health Response

Health Assessment Section

Ohio Department of Health

Health Assessment Section (HAS)
Bureau of Environmental Health

Ohio is a CDC **Agency** for **Toxic Substances** and **Disease Registry (ATSDR)** Cooperative Agreement funded state. **ODH HAS** is awarded a federal grant to fund staff salary and training.

ODH HAS - ATSDR evaluates environmental data in order to determine if there is an exposure to toxic chemicals through contact with contaminated air, water and/or soils, and if there is a public health hazard posed to the community living near the hazardous waste site/release.

The mission of the federal-state partnership is to serve Ohio's communities by using the best-available science to prevent harmful exposures to toxic chemicals in the environment.

How did we get involved?

Ohio Methamphetamine Task Force

In 2005, Governor Taft created the Methamphetamine Task Force to address the growing problem of meth labs in Ohio.

Members of the workgroup include reps from the BCI, ODADAS, OSHP, ODH, OEPA, ODNR, ODRC, state Supreme Court, and representatives from Ohio's local public health departments, Drug-Free Action Alliance and the Ohio Resource Network.

ODH was specifically asked to review and evaluate the current data and issues surrounding the cleanup of former meth labs and to develop standards and/or guidance to determine what is clean and what is safe for re-entry of a former meth lab.

Bureau of Environmental Health
Health Assessment Section

Methamphetamine "Meth"
A Public Health Issue

Meth: A Public Health Issue

Methamphetamine (meth) use and production pose many threats to public health. Meth is a highly addictive man-made drug that can be smoked, snorted, injected or eaten. Meth use increases the heart rate and blood pressure to dangerously high levels and long-term meth use can lead to brain and liver damage, stroke, coma and death.

Meth is not only a health threat to the individuals who use it, it is a threat to the children living in or near meth labs that are exposed to the risk of fire, explosion and toxic chemicals. The chemicals that are used to make meth threaten a child's still-developing nervous and reproductive systems, as well as other organs and body systems. Other health hazards children are exposed to in these chaotic environments may include abuse, neglect and unsanitary living conditions, as well as access to weapons and unguarded meth that is lying around.

Meth's Toxic Chemicals and Environmental Hazards

Found in counties across the state of Ohio, illegal labs produce meth using over-the-counter drugs and common household items. Recipes to make meth can be found online and include common items such as ephedrine or pseudoephedrine (cold medicines); rubbing or isopropyl alcohol; ammonia; lithium (batteries); sulfuric acid/sodium hydroxide (drain cleaners); ether (engine starter); toluene (brake cleaner); and other toxic chemicals.

Meth was traditionally manufactured or "cooked" using a stovetop or portable burner. In 2009, the highly-portable "one-pot shake and bake" cooking method was introduced, where a stove/burner was no longer needed and the meth could be cold "cooked" in a plastic 2-liter pop or larger sports drink bottles. However, whether using a traditional stovetop kitchen cook or the one-pot method, it is during this "cooking" process where there is an acute, immediate danger to life and health (IDLH) hazard posed to the meth cooker and anyone near where the meth is being cooked.

While there is considerable scientific evidence of the threat posed by the active meth "cook," there is very little research available about the public health threat, acute or chronic, posed by the meth residues left behind from a former stovetop cook. There is no research on what (if any) meth residuals are left behind from the one-pot cook.

Meth Lab Cleanup:

A local health district responsibility?

Ohio's local health districts have no legal mandate to address meth labs. However, local health departments often serve as contacts and sources of information for concerned residents, fire and EMS-EMA officials, law enforcement agencies, child protection services and even real estate representatives. Often these above-mentioned sources ask the local health department to provide cleanup guidance and/or attest to the safety of re-occupancy of a home or a room where a meth lab operated. Local governmental agencies can address cleanup of these sites under their local building code laws and/or the health department could use their authority to require the cleanup of former meth labs under their public health nuisance laws.

National Guidelines:
In December 2007, the Methamphetamine Remediation Research Act (Public Law 110-143) was passed, which directed EPA to establish voluntary guidelines for the remediation of former meth labs based on the best currently available scientific knowledge. In August of 2009, the U.S. EPA published *Voluntary Guidelines for Methamphetamine Laboratory Cleanup* (March 2013 revision).

State Guidelines:
ODH continues to support a process-based cleanup as the best-practice for cleaning former meth lab sites in Ohio. The goal of this simple cleanup guidance is to eliminate the exposure to the former meth lab contamination by reducing and isolating any residual meth, the identified chemical of concern of former meth labs. To view a copy of the meth lab cleanup guidance document, visit the ODH Health Assessment Section webpage, Chemical Fact Sheets section and select Meth Lab Cleanup.

Where can you get more information?

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390

Revised: 02/21/14

Bureau of Environmental Health
Health Assessment Section

"To protect and improve the health of all Ohioans"

Meth Lab Cleanup

ODH best-practice guidance document

The local health district responsibility:

Ohio's local health districts have no legal mandate to address meth labs. However, local health departments often serve as contacts and sources of information for concerned residents, fire and EMS-EMA officials, law enforcement agencies, child protection services and even real estate representatives. Often these above-mentioned sources ask the local health department to provide cleanup guidance and/or attest to the safety of re-occupancy of a home or a room where a meth lab operated. Local governmental agencies can address cleanup of these sites under their local building code laws and/or the health department could use their authority to require the cleanup of former meth labs under their public health nuisance laws.

In December 2007, the Methamphetamine Remediation Research Act (Public Law 110-143) was passed, which directed the U.S. EPA to establish voluntary guidelines for the remediation of former meth labs based on the best currently available scientific knowledge. This document provides voluntary cleanup guidelines to homeowners, cleanup contractors, industrial hygienists, policy makers and others involved in meth lab cleanup. However, some states have established their own cleanup standards and cleanup numbers and some certify cleanup contractors.

Meth lab hazards:

Studies by the national research centers and public health agencies demonstrate that active meth "cooks" pose an acute, immediate danger to life and health (IDLH) hazard through chemical exposures and the risk of fire or explosion to the "cookers" and others in the structure at the time of the cook. While there is considerable scientific evidence of the threat posed by the active meth cook, there is very little research available about the public health threat, acute or chronic, posed by the methamphetamine residuals in indoor environments in former meth labs homes, motel rooms and other commercial properties.

Meth was traditionally manufactured or cooked using a stovetop or portable burner and included a lot of chemicals and equipment. In ≈ 2009, the highly-portable "one-pot shake and bake" cooking method was introduced, where a burner was no longer needed and the meth could be "cold-cooked" in a plastic 2 -liter pop or larger sports drink bottles. This new method significantly decreased the amount of chemicals, equipment and time needed to make meth. * To view a listing of some of the chemicals used to make meth, visit Meth – A Public Health Issue

However, whether using a traditional kitchen cook or the one-pot method, it is during the active cook process when it is most dangerous to the meth cooker and anyone near the cook.

Traditional kitchen cook

One-pot shake and bake

What is clean? What is safe? How do you make these determinations?

The following bulleted points are considerations public health officials must take into account when asked the above questions:

No National Standards:

- There are no national standards, no widely-embraced rules, regulations or numbers to guide property assessment and cleanup of former meth labs.

Chemicals you would expect to find:

- Most of the chemicals used to make meth are volatile organic compounds (VOCs) that volatize (turn from liquid to gas) and have relatively short half-lives (often measured in hours) in the environment. Research has identified that the only chemical of concern left over from a meth cook are the methamphetamine residuals.

No two meth labs are alike:

- The traditional kitchen cook, which spreads meth vapor residue throughout a room, is much different than the self-contained and mobile one-pot shake and bake. Also, where did the cook take place (kitchen- basement- shed- garage- porch)?

Meth lab cleanups, as required by some states, are not cheap:

- Experience in Oregon indicates average cleanup costs of $6,500/1,000 ft^2 of property with an additional cost of an up-front assessment of $1,400.

What are other states doing?

As of March 2013, 25 states require or recommend former meth labs (methamphetamine residuals) be cleaned to standards ranging from 0.05 µg/100 cm^2 to 1.5 µg/100 cm^2. The Ohio Department of Health (ODH) suggests there are problems with establishing cleanup numbers that are derived from the detection limits of the analytical equipment used and not demonstrated health-based cleanup numbers. However, California's Department of Toxic Substances Control (DTSC) announced that it had calculated a health-based remediation standard for meth of 1.5 µg/100 cm^2.

Data Gaps & Residual Risk - What we still need to find out:

- Is post-cook meth residue a public health hazard?
- Does "sample-able meth" from a material indicate human exposures to meth?
- Health Risk Assessments:
  - Is meth residue on surfaces/in materials mobile and available to people through ingestion, inhalation or dermal contact?
- What is the out-migrating behavior of meth residue from various materials, e.g. through new paint?
- What are the health-based standards for starting and stopping a cleanup, considering a variety of building materials?
- What are the sampling methods and interpretation suited to variety of materials?
- What are the differences between a traditional stovetop cook versus a one-pot shake and bake cook?
- Are there any studies to demonstrate the distribution of meth residuals from a one-pot cook?

What is currently going on in Ohio?

Created in February of 2006, Ohio Senate Bill 53 regulated the availability of pseudoephedrine, restricting it to behind the counter sales and limited quantities. This was followed by significant decreases in the number of home meth lab busts by the Ohio Bureau of Criminal Investigation (BCI) in 2006 and 2007.

By 2009, the new one-pot shake and bake method of manufacturing meth, designed to get around laws restricting the sale of the ingredients needed to make meth, started spreading across the country. In federal fiscal year 2013, Ohio's BCI seized just under 1000 labs in Ohio. The one-pot shake and bake method accounted for 90% to 95% of the labs seized.

The one-pot method is extremely dangerous. If the bottle is shaken the wrong way, if any oxygen gets inside of it, or if the cap is loosened too quickly, the bottle can explode into a fireball.

Revised: 02/21/14

ODH Meth Lab Cleanup Guidance:

ODH continues to support process-based (isolate and contain) cleanup as the best-practice for cleaning former meth lab sites in Ohio. The goal of this simple, anyone-can-do guidance is to eliminate the exposure to the former meth lab contamination by reducing and isolating any residual meth, the identified concern of former meth labs.

Conduct a rigorous meth lab cleanup!

- Ventilate
- Remove and discard all carpet, furniture, drapes (all porous materials) and low-value contents
- HEPA vacuum to remove some of the meth from rough, porous surfaces
- With a strong surfactant (detergent), wash x2 to prep for priming/sealing and painting (wash down everything from ceiling to floor -- see page 14-15 of the EPA *Voluntary Guidelines for Methamphetamine Laboratory Cleanup*)
- Prime/seal and paint x2 from ceiling to floor (use an oil-based paint or a high-gloss latex provides a tough top cover/shell)
- Wash/clean HVAC heating/cooling devices and duct work
- Wash high-value contents if possible

You may not be able to get rid of all the meth residues, but can get rid of most of it. Three simple rules should be followed:

- **Ventilate, clean and rinse**
- **When in doubt, throw it out**
- **Prime, paint and seal x2 (isolate and contain)**

For more information:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390

References:

ASTHO Issue Brief: Cleaning-up Clandestine Methamphetamine labs: The Role of State Public Health Agencies. June 2005.

Minnesota Department of Health, Clandestine Drug Labs in Minnesota: Health, Safety, and Remediation. March 2004.

Minnesota Department of Health. Meth Users: Signs, Symptoms, and Health Effects. 2004. www.health.state.mn.us/divs/eh/meth/index.html

U.S. EPA *Voluntary Guidelines for Methamphetamine Laboratory Cleanup* March 2013 rev.

The Meth Problem in Ohio

The Meth Problem in Ohio (cont.)

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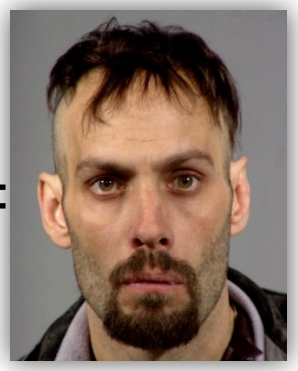

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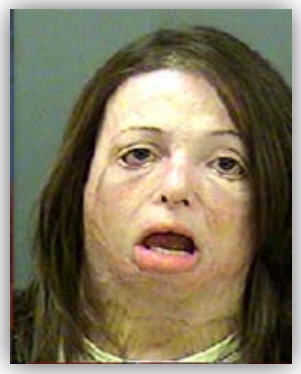


Sudafed© *is* practically meth!

(*not pharmacologically, though*)

Five Steps of Meth Production

- **Extract ephedrine**

- **Convert ephedrine to methamphetamine**
  - **hydrogenation of the hydroxyl group on the ephedrine or pseudoephedrine molecule**

- **Extract methamphetamine**

- **Convert to HCl Salt** – **aka "salting out"**

- **Filter and dry**

No two labs are alike

Red Phosphorus

"Cold" or "Red P" Method

Crushed Cold Tablets + Alcohol

Red phosphorus + water + iodine
NaOH (exothermic rxn) = "meth base"

Meth base + solvent = meth extraction into solvent

"Salting Out"

Salt + sulfuric or muriatic acid = Hydrogen Chloride (HCl) gas

HCl (g) bubbled through the meth base

Red P involves a series of substitutions, multiple steps, bigger labs, more meth produced, and more lab by-product.

Anhydrous Ammonia

"Nazi" or "Birch Reduction" Method

Crushed Cold Tablets + Alcohol

Lithium + anhydrous ammonia = "meth base" (violent reaction)

Straight conversion

Meth base + solvent = meth extraction into solvent

"Salting Out"

Salt + sulfuric or muriatic acid = Hydrogen Chloride (HCl) gas

HCl (g) bubbled through the meth base

Nazi produces a smaller quantities of meth, but in a shorter period of time. Simpler process (less steps) than the "Red P" method and it produces a "purer" product.

Common Chemicals in "Traditional Kitchen Cook" Meth Labs

- 1-pheny1-2- propanone
- Hydrogen peroxide 3%
- methyl benzene
- 2-Butanone
- methyl ethyl ketone
- 2-Phenylacetic acid
- diethyl ether
- Methylamine
- 2-propanone
- dimethyl ketone
- Muriatic acid/hydrogen chloride
- acetone
- Ephedrine/Pseudoephedrine
- Natural gasoline
- Naptha
- Methyl iodide
- Formaldehyde (Formalin soln)
- Ammonia (anhydrous)
- phenylmethane
- red phosphorous
- battery acid/sulfuric acid
- benzeneacetic acid
- iodine
- safrole
- Benzyl methyl ketone
- lithium (from batteries)
- sodium hydroxide
- carbinol
- methamphetamine
- Toluene/xylenes
- methanol

One-pot Shake and Bake

Chemicals

Equipment

The one-pot use <u>significantly</u> less chemicals, equipment and time needed to make meth. It is a simple process and highly mobile. But <u>HIGHLY</u> explosive.

Meth Lab Hazards:

Explosion/Fire hazards

Toxic Chemicals

- National Jewish Research and Medical Center
  www.nationaljewish.org/news/meth_results.html

Hazards of a hallucinating & paranoid "cooker"

Booby traps

formication

Meth Lab Hazards:

When actively "cooking" meth:

High level health risk

- Mostly from fire/explosion hazard.
- Also from inhalation of vapors and gases that pose an Immediate Danger to Life and Health (IDLH).
  - "Nazi" method: Ammonia will likely exceed IDLH during cook
  - "Red P" method: HCl approaches IDLH during "salting out" phase

After "cooking" meth:

Lower level but potential health risks

- Threat mostly posed by direct contact with the toxic/caustic chemical wastes.
- Potential exposure to methamphetamine residues.

NOTE: There are currently no human health studies and data that demonstrate the health risk posed by methamphetamine residues in a former meth lab structure.

Potential Chemical Hazards

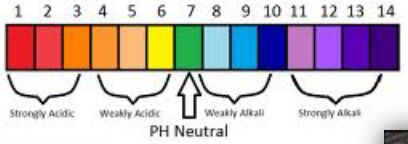
Solvents/volatile organic compounds

Anhydrous ammonia

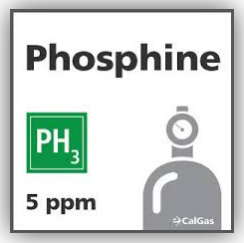
Reactive or heavy metals

Iodine

Strong acids and bases (HCl gas)



Phosphine gas



Methamphetamine

Indoor Air Contaminants Levels

(milligrams per cubic meter or mg/m^3)

	Near Cook		Not Near Cook	Occupational Exposure Limits		
	Min	Max	Max	TWA*	STEL**	IDLH***
Phosphine	0.2	4.8**	0.67*	0.4	1.0	70.0
Iodine	0.008	37.0***	0.29	n/a	1.0c	20.0
Hydrogen Chloride (HCl)	0.32	228.0***	5.3	n/a	7.0c	70.0
Anyhydrous Ammonia	190.0**	410.0***	366.0***	18.0	27.0	208.0
Meth	-	5.5	4.2	n/a	n/a	n/a

Source: National Jewish Research and Medical Center

Minnesota Pollution Control Agency Study: Former Meth Labs

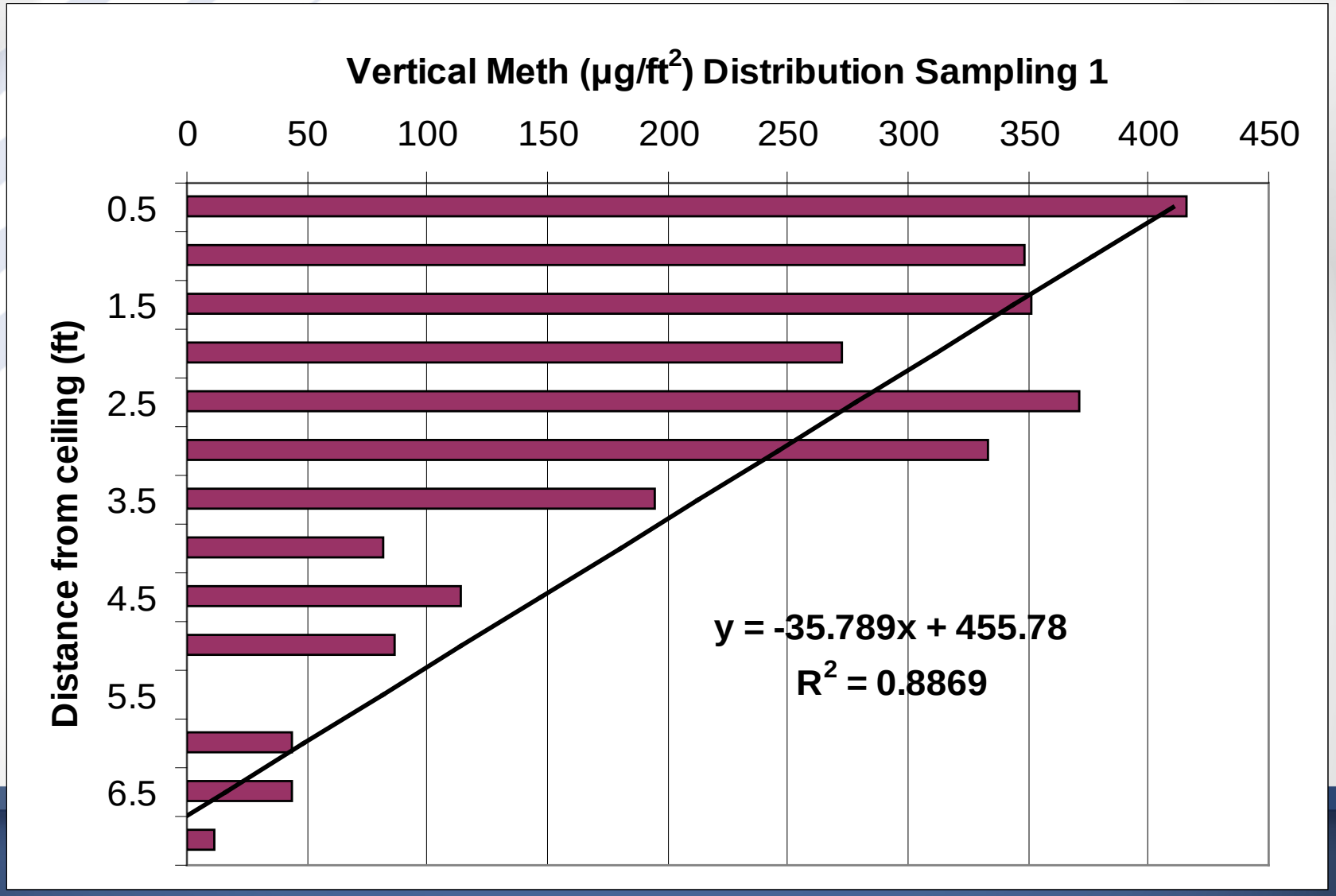
Meth Distribution Sampling

						42"		2nd sampling			1st sampling													
								273	57"		416													
2nd sampling	149	143	135	145	163	149	122	281	84.2		348.4		198	120	192	179	216	157	346	313	163	168	98.4	193
								146			351.6													
								166			272.8													
								193			371.6													
								231			333.2													
								105			194.8													
								69.8			82.0													
								54.6			113.6													
								76.4			86.8													38.5"
1st sampling	134.0	80.4	46.8	46.4	46.4	307.6	79.2	70	56.8			64	150.4	178.8	258.8	178.8	144.4	56.8	612	167.2	88.8	89.6	78.8	154.4
								72.2			43.2													
								43.3			43.2													
								6.5			11.2													
												25.5"												

Window

Sampling solvent: Methanol
Data: Methamphetamine (µg/ft^2)
Room Height: 8 feet
Room Width: 12 feet

Vertical Wipe Sampling Results



Potential for Exposure

Vapors, liquids or solids released during cooking process

Explosion from vessel rupture

Spills

Contact with waste

- 1 lb. meth creates 5-6 lbs. waste
- Most labs are small scale

Who's at Risk for Exposure?

- Cookers and their family
- Unsuspecting visitors
- Fire fighters/Law enforcement
- Property owners
- Housekeepers (hotels/motels/RV Parks)
- Roadside workers
- Future occupants

Meth Lab Clean-up:

Removal of Chemicals & Lab Equipment

Ohio Attorney General's Bureau of Criminal Investigation (BCI) conducts meth lab investigations and seizures in Ohio.

Meth Lab Clean-up:

Removal of Chemicals & Lab Equipment (cont.)

DEA-trained BCI staff is responsible for:

- **Coordinating the seizure of the clandestine lab, equipment and materials;**
- **Assessing the lab re: health & safety issues;**
- **Processing the site for evidence, removing lab equipment, containers and chemicals from the lab site; and**
- **Properly disposing of these wastes.**

Meth Lab Clean-up:

Removal of Chemicals & Lab Equipment (cont.)

The local fire department is notified and on-scene during lab seizure operations.

Local law enforcement typically contacts the local health department and the property owner if the lab site is a rental.

Clean-up of Former Meth Labs
The Public Health Issues:

- **Studies by the National Jewish Medical & Research Center and other health agencies demonstrate conclusively that *active Meth Lab "cooks"* pose an *acute public health hazard* through chemical exposures and the risk of fire or explosion to the "cookers" and others in the structure at the time of the cook.**

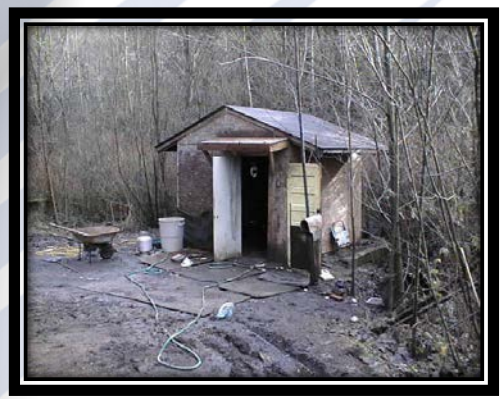
- **Much less is known about the public health threat, acute or chronic, posed by methamphetamine residuals in indoor environments in former meth labs in residential homes, motel rooms and other commercial properties.**

- **No data is available on the extent of meth residue contamination posed by the one-pot shake and bake method.**

Clean-up of Former Meth Labs (cont.)

What is the extent of contamination and use of the dwelling?

1. **No two meth labs are alike.**



Clean-up of Former Meth Labs (cont.)

1. **No two meth labs are alike (cont.).**

Clean-up of Former Meth Labs (cont.)

What is Clean? What is Safe?
How do you make these determinations?

2. **There are <u>no national health-based standards</u> regarding acceptable levels of methamphetamine residue contamination in indoor residential environments.**

3. **There are no widely-embraced rules, regulations or numbers to guide assessments and clean-ups of former meth labs.**

4. **There is no consensus with regard to how much clean-up is necessary. Clean-up requirements can run the gamut from doing nothing to burning down the building.**

Clean-up of Former Meth Labs (cont.)

Should former meth labs be held to higher indoor environmental quality standards than a typical residential dwelling?

5. **Many of the VOCs used in meth production are common household products regularly used and/or stored in the home. Indoor air in most homes, especially those with cigarette smokers, will typically exceed health-based minimum risk standards.**

Clean-up of Former Meth Labs (cont.)

Are these chemicals a health threat to future occupants of the former meth lab site 3 months later, 6 months later, a year later, 5 years later?

6. **Most of the identified Chemicals of Concern associated with active meth lab operations are the volatile organic compounds (VOCs) with relatively short half-lives (often measured in hours) in the environment. The only chemicals that appear to be left over after the lab is busted and dismantled are the methamphetamine residues. These are man-made organic compounds. What is the average decay (breakdown) of these meth residues?**

Clean-up of Former Meth Labs (cont.)

Does the potential public health risk justify the costs of these clean-ups?

7. **Meth lab clean-ups, as required by some states, are not cheap. Experience in Oregon indicates average clean-up costs of $6,500/1,000 ft^2 of property with an additional cost of an up-front assessment of $1,400.**

8. **Who has the regulatory authority to require clean-up of a former meth property? Who pays for the clean-up? Who makes sure the clean-up is done right? Who has the responsibility to determine whether or not the dwelling is safe for re-occupancy?**

Proposed Ohio Legislation

February, 2006:

Ohio Senate Bill (SB) 53 regulated the availability of pseudoephedrine restricted to behind the counter sales in only limited quantities. This was followed by significant decreases in the number of home meth lab busts by BCI in 2006 and 2007.

2009-2010:

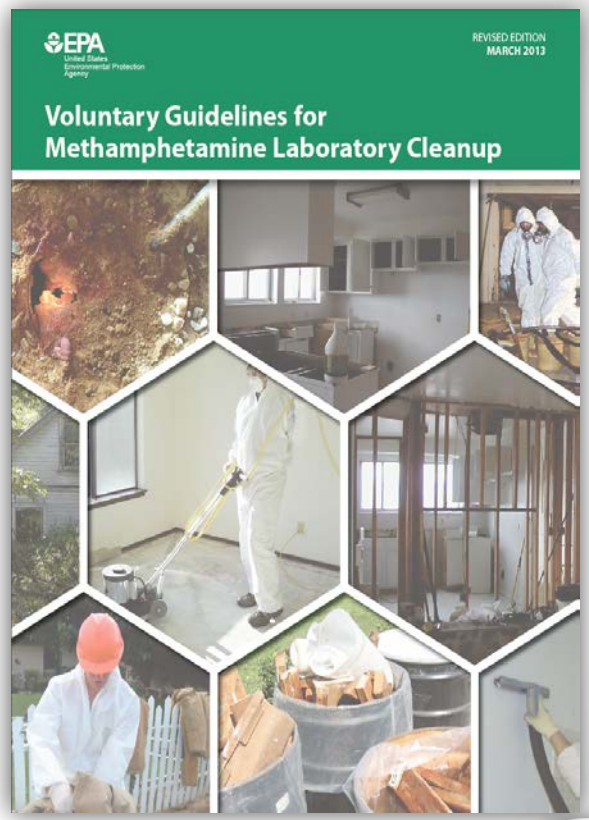
House Bill (HB) 33 – Residence/Motor vehicle cleanup certification program.

2014-2015:

Senate Bill (SB) 22 -- Upon law enforcement notice, the board of health shall declare a former meth lab a public health hazard that may not be occupied until the board determines that the structure or unit is no longer a public health hazard. ODH is to create meth lab cleanup standards and a certification program for cleanup contractors.

US Methamphetamine Remediation Research Act of 2007

In December 2007, the Methamphetamine Remediation Research Act (Public Law 110-143) was passed, which directed the U.S. EPA to establish voluntary guidelines for the remediation of former meth labs based on the best currently available scientific knowledge. In August of 2009, the U.S. EPA published *Voluntary Guidelines for Methamphetamine Laboratory Cleanup (*March 2013 revision).



Methamphetamine

Establishing a health-based number

<u>December, 2007:</u>
California EPA Established a Reference Dose (RfD) for Methamphetamine of 2.7 X 10^{-4} mg/kg-day

RfD = dose at or below which no adverse health effects are likely to occur

<u>Based on two human health studies:</u>

- **1961 study of meth use to control weight gain in pregnant women (weight loss)**
- **1965 study of meth use to reduce incidence of bed-wetting in children 4-15 yrs in age (sleep disturbance)**

Methamphetamine

Establishing a health-based cleanup number

California used the RfD to calculate a health-based cleanup standard of residual meth on hard surfaces = 1.5 µg/100 cm^2 (aka 1.5 micrograms per 100 square centimeters) -- Wyoming, Kansas, Minnesota

<u>Meth Clean-up Standards across the nation:</u>
Current clean-up standards range from 0.05 to 1.5 µg/100 cm^2.

Data Gaps
What we still need to determine

Very little is known about the public health threat, acute or chronic, posed by methamphetamine residuals.

Does "sample-able meth" from a surface indicate a human exposure?

Is meth residue airborne AFTER a cook?

Are the meth residues on surfaces/in materials mobile and available to people by mouth, skin, lung? How much is available?

No Health Risk Assessments:

- Intake of meth residues:
  - Via lungs (during cook-after cook?)
  - Via ingestion - GI tract (residues hand-to-mouth?)
  - Via dermal (residues absorbed through skin?)

Data Gaps (cont.)

What is the extent of contamination of meth residues from different lab cook methods? -- especially from a one-pot shake and bake lab

Considering a variety of building materials, what are the health-based standards for starting and stopping a clean-up?

What are the sampling methods and interpretation suited to variety of materials?

If meth residues infiltrate porous building materials (drywall-sheetrock, wood, etc.), what is the out-migrating behavior of meth residue from those various materials (drywall, paint, wood, metal, etc.)?

What are the chemical residues left from liquid spills or powders?

Methamphetamine Lab Busts

- In 2011 there were 375 meth lab busts
- In 2012 there were 607 meth lab busts
- In 2013 there were 881 meth lab busts
- Since October 2013, there have been 315 meth lab busts

ODH Involvement w/ Shake and Bake:

In March of 2012 there was a fire at the Park Haven Nursing Home in Ashtabula, Ohio that killed one person and injured six others. The Ashtabula Fire Department determined that the fire was the result of a one-pot shake and bake meth lab operation, evidently conducted by the fire victim, a non-resident.

The US EPA confirmation/clearance sampling determined there were no meth residues and/or VOCs. Likely due to the fire.

Since 2013, 90-95% of the meth labs being busted are the one-pot shake and bake method -- BCI

Process-based Clean-up Guidance

Conduct a rigorous clean-up:

- **Ventilate**
- **Remove and throw away carpet, furniture, porous or low-value contents (this will remove <u>most</u> of the residual meth mass)**
- **HEPA, wash 2x to prep for priming and painting (continually replace used water/detergent mixture with fresh-clean water/detergent)**
- **Prime, paint or seal 2x (use an oil-based or hard outer coating latex paint)**
- **Wash high-value contents if possible**
- **Consider structure use and the non-occupancy areas for cleaning**

The goal is the mass reduction/isolation of meth residue

What are other states doing?

As of March 2013, 25 states require or recommend former meth labs (methamphetamine residuals) be cleaned to standards ranging from 0.05 µg/100 cm^2 to 1.5 µg/100 cm^2.

We suggest there are problems with establishing cleanup numbers that are derived from the detection limits of the analytical equipment used and not demonstrated health-based cleanup numbers.

California calculated a health-based remediation standard for meth of 1.5 µg/100 cm^2.

Alaska, Arizona, Tennessee, Utah, Washington State, =	0.1 µg/100 cm^2
Colorado, Oregon =	0.5 µg/100 cm^2
New Mexico =	1.0 µg/100 cm^2
California Wyoming, Kansas, Minnesota =	1.5 µg/100 cm^2

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Revised: March 2014