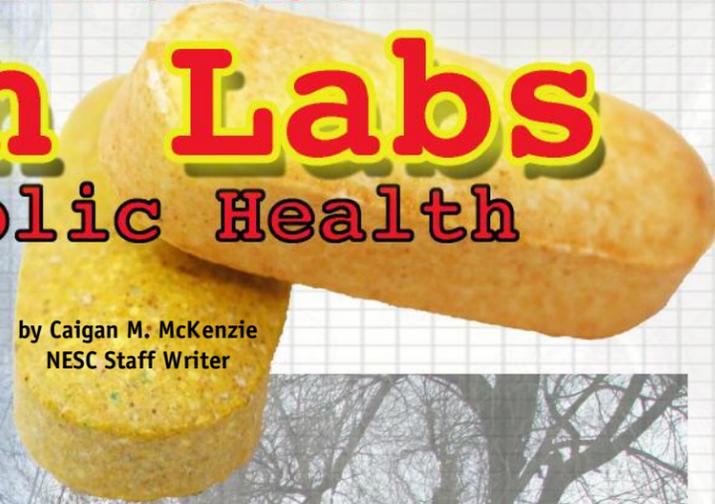


An Environmental Menace

Meth Labs

Endanger Public Health

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If you think methamphetamine doesn't affect you—think again. In the past five years, clandestine meth labs have been found in every state, according to the U.S. Department of Justice Drug Enforcement Administration and a July 18, 2006 National Association of Counties Survey found that meth is the leading drug-related local law enforcement problem in the country.

These illegal labs significantly endanger both the public health and the environment because the materials used to make meth are highly flammable and explosive, and for each pound of meth that is manufactured, five to seven pounds of toxic waste are produced. Typically, the toxic waste from the production site is dumped into indoor plumbing drains that drain into a city sewer system, an individual sewage treatment system, or directly onto the soil; or it's disposed of into burn or burial pits in backyards or open spaces. It can even be found in suitcases discarded along the sides of roads. Waste can also collect in plumbing drains and traps, emitting noxious fumes.

What is meth?

Methamphetamine (commonly referred to on the street as meth, speed, chalk, ice, crystal, crank, and glass) is a synthetic, central nervous system stimulant in a family of drugs known as amphetamines. There are two chemical forms of meth, d- and l-meth. The d form is the potent central nervous system stimulant that is found in an illegal meth lab. It is a highly addictive drug that can be taken orally (swallowed), inhaled (snorted), smoked or injected. The l form only mildly affects the central nervous system and is found in over-the-counter pharmaceutical products.

Depending on the method of manufacturing, meth may vary in color from white to brown, pink to red or in various shades of yellow or green. Meth can come in pill form, powder or chunks. Crystal meth resembles rock candy, or chunks of ice or crystal.

One reason for its proliferation is because hundreds of common, inexpensive, and easily available products and substances can be interchangeably used to produce meth; for instance,
Freon (refrigerant), ether
(starting fluid for en-

gines), acetone and toluene (paint thinners), sulfuric acid (drain cleaner), pseudoephedrine (cold medicine), and lithium (camera batteries). In addition, the process itself doesn't require technical knowledge, and the recipe and step-by-step instructions are readily available on the Internet.

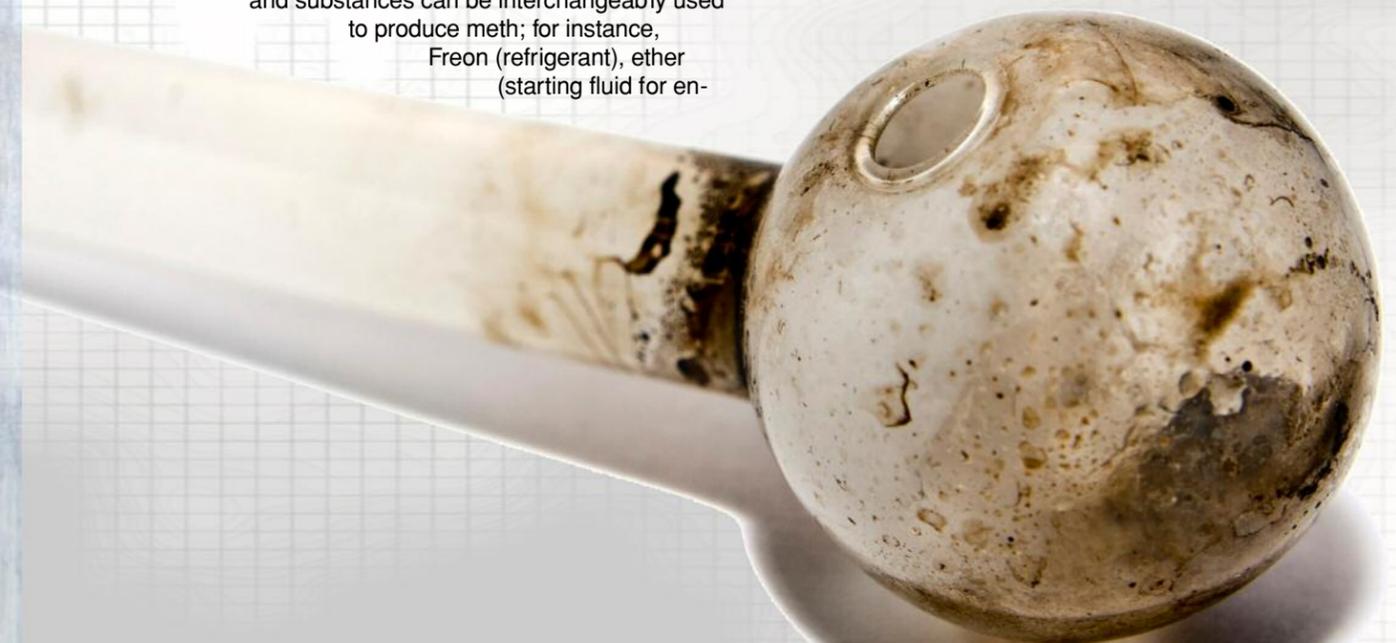
Illegal meth labs can be found anywhere, including homes, sheds, barns, motel and hotel rooms, campgrounds, parks, and even in car trunks. However, they are typically found in rural areas because the telltale odors they produce—smelling like ammonia, ether, cat urine or rotten eggs—are less likely to be discovered in open areas.

Another reason rural areas make ideal lab locations is because farms keep an ample supply of anhydrous ammonia, a nitrogen-based agricultural fertilizer that drug dealers often use to manufacture illegal meth.

Environmental Hazards

"The primary environmental hazard [of meth waste] is possible contamination of groundwater by VOCs [volatile organic compounds], such as acetone, toluene, and ether, used in the meth cooking process," according to the Minnesota Pollution Control Agency (MPCA) website. "In limited samplings to date, the MPCA has not yet identified levels of concern in groundwater due to meth lab-related wastes." However, once the waste gets into the soil or groundwater, it can stay there for years.

VOCs from meth production, however, may injure or kill the bacterial growth that provides sewage treatment in a drainfield, requiring costly specialized remediation by professionals. Signs that meth waste has entered the septic system includes strong or unusual odors around the septic tanks such as ammonia and vinegar; an abnormally low or high pH; abnormally high Carbonaceous Biological Oxygen Demand (CBOD) spikes; and wastewater tests that are positive for VOCs.



Case Study in Minnesota

Ryan Brandt, president of EcoCheck, a Minnesota-based company, discovered a suspected meth lab at one of the onsite wastewater systems he operates and maintains. He noticed periodic spikes of influent CBOD that were 10 times stronger than typical domestic waste. After the first few spikes, he began to keep a closer eye on the influent water quality. Specifically, he kept track of pH. A normal pH value for this wastewater was 7.0 – 7.5 Standard Units (SU), but when the CBOD spikes occurred, the pH dropped to 4.0 – 5.0 SU. Abnormally high or low pH values have been associated with other illegal dumpings of meth waste into septic tanks.

Brandt took VOC samples of the influent entering the wastewater treatment facility. Compounds identified in the samples that tested positive for VOCs showed:

- Benzyl Alcohol (used in solvents and paint)
- Phenol (fire hazard, found in urine, disinfectants and over the counter drugs)
- 4-Methyl phenol

Compounds tentatively identified in the samples that tested positive for VOCs revealed a toxic stew, including: 9-Hexadecanoic acid (used in adhesives), Hexadecanoic acid (used in adhesives), and Propanoic acid (used in herbicides and in making alcohol).

In November 2002, Brandt involved the local deputy sheriff and the regional fire department. The deputy sheriff knew the backgrounds of most people in the area, and the fire department had the equipment to do some preliminary tests on the wastewater. They tested individual and shared grinder stations and screened the samples for VOCs in December and January. For the samples that tested positive, they performed an analysis with a mass spectrometer and called in the Drug Enforcement Administration for assistance.

"During this study, the discharges suddenly disappeared as a result of the investigation," Brandt says. "One final illegal discharge was detected in April 2002." To date, Brandt points out, no other illegal discharges have occurred.

"We had to rebuild the entire vertical flow wetland bed," Brandt says. "So we took out the rock, put in a new piping system that had more capacity to avoid a situation like this again. We rebuilt the dosing lines and put in new rock, and it has been functioning fine, even to today. It cost approximately \$20,000 to \$30,000 to rebuild it."

Pierce County, Washington State

"Washington state passed legislation in 2006 that restricted the sale of pseudoephedrine, and it had a significant effect on reducing the number of 'mom and pop' operations," says Tony Ohrazda, environmental health specialist, Tacoma-Pierce County Health Department, Clandestine Drug Lab Program. In 2005, before the legislation, Washington state had 532 incidents; in 2008, they had dropped to 137.

"Generally speaking, if law enforcement has found a meth lab, there is a high probability that the septic tank

will have contaminants in it because nine times out of 10, the drug manufacturers are dumping waste down the toilets or sinks," Ohrazda says. Washington state doesn't offer a lot of state guidance; it's up to each local health jurisdiction to determine how to remediate drug labs.

To determine the chemicals used in the manufacturing process, Ohrazda explains that the health department reviews the manifest of the materials law enforcement collected and looks at what the State Department of Ecology took. Most of the time, he points out, labs are using the anhydrous ammonia method. This is the preferred method for mom and pop labs that make small quantities of meth, while labs that make larger quantities of meth use the red phosphorus method. (The red phosphorus method often generates more side products and impurities that increase the production hazards.)

"Regardless of which method the drug maker used, you are dealing with hydrocarbons being dumped into the septic system and maybe some metals," Ohrazda says. "Bacteria that live in the system eat hydrocarbons, but if the concentration of chemicals being dumped in the system is too high, it can kill off the tank. You also have to take into consideration the quality of the system. For example, we have found 55-gallon drums full of gravel at meth labs, so basically what you have is an underground storage tank that is leaking. Even if you have a system that operates well but is fairly full, you are still going to have a problem because the waste will go right out into the drainfield."

When a drug lab is found in Pierce County, the health department requires the property owner to hire a cleanup contractor to sample the septic tank for VOCs using U.S. Environmental Protection Agency (EPA) method 8260 (VOC Analysis). "We ask that the sample encompass all layers of the septic tank because there might be something problematic at the bottom," Ohrazda says. "The hydrocarbons float and the metals sink, so you want an average contaminant level of the tank. You want to look at a snapshot of the whole column of water. Regardless of how low the contaminant level is, the tank must still be pumped. We want everything out. If the sample comes back above our state clean-up standards for soil, then the property owner must test the drainfield. We treat it the way we would a hazardous spill."

The drainfield sample comes from the most likely point of contamination, which is the first segment of perforated pipe. The area is excavated to expose the pipe and then a sample is taken from directly underneath it, again performing laboratory analysis using EPA method 8260. "We ask the contractor to define the vertical and lateral extent of the contamination; then they have to go through the disposal process of contaminated soil," Ohrazda says. "We test the pit left behind to make sure the sidewalls and bottom are free of contamination. Usually the waste doesn't travel very far, but there are always exceptions."

Ohrazda explains that it is rare that a drainfield will be impacted because septic tanks do a good job of remediate hydrocarbons. Still, he explains, they are aggressive in Pierce County, so they do require documentation

showing that all the contaminants have been removed. Once a meth lab is discovered, the property title is tagged with an order that says it is unfit for use and no one is allowed on the land; after an approved remediation, another order called a "Refit for Reuse" health order is attached to the title. Both orders remain on the title.

In Pierce County, the cost to pump a tank is about \$350; the cost for obtaining one sample is about \$200, and labor is about \$200 because no one wants to dig in a contaminated area. If you have to look at the drainfield, you are looking at the additional cost of excavating and at obtaining between three to five more samples.

Some Good News

"The Combat Methamphetamine Epidemic Act, which took effect [nationally] in 2006, put products that contain the key ingredients behind the counter at retail stores, limited retail sales, and regulated the much-abused 'spot market,'" according to a speech delivered by Attorney General Michael B. Mukasey at the National Methamphetamine Chemicals Initiative Conference on May 7, 2008. "State legislatures have passed their own measures to combat meth manufacturing and to make it more difficult for manufacturers to obtain precursor ingredients."

The numbers collected in the U.S. Drug Enforcement Agency's National Clandestine Laboratory Database confirms this reduction of incidents. In 2005, police seized 12,619 meth labs across the U.S., but this number has dramatically decreased to 6,783 meth labs being seized in 2008.

Cleaning Up a Meth Lab

There are currently no official federal guidelines or regulations on how to clean up a former meth lab property for reoccupation, and states and localities have different statutes and regulations related to the cleanup and remediation of illegal meth labs. Check with your local health department for information about meth lab cleanup and for a list of environmental companies that are trained in hazardous substance removal and cleanup.

Clean up costs usually fall on the shoulders of property owners and can be thousands of dollars; some buildings or dwellings may even require demolition. One professional meth clean-up company estimates a cost between \$5,000 and \$15,000 to remediate a 1,500 square foot ranch house, and they caution that most insurance companies exclude "contamination" and "felony activities" from coverage for private homes and for some commercial properties.



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(Case study reprinted with permission from the University of Minnesota, Onsite Sewage Treatment Program.)

For More Information

For information about how meth affects farmers, visit the Pennsylvania Farm Bureau's "Meth Awareness" website at www.pfb.com/news/ag-issues/safety/meth-awareness.html.

Learn more about the Combat Meth Act of 2005 by visiting the United States Department of Justice website at www.deadiversion.usdoj.gov/meth/q_a_cmea.htm#5.

Washington State Department of Health has general information about meth labs at www.doh.wa.gov/ehp.cdl/methlab.htm.

The Kansas Department of Health and the Environment offers the following steps for cleaning a former meth property:

1. Air out the building before and during cleanup.
2. Remove all unnecessary items and dispose of them.
3. Remove visibly contaminated items or items that have an odor.
4. Air out the building for three to five days after the removal of unnecessary and visibly contaminated items.
5. Clean all surfaces using full strength bleach where it will not ruin the surface.
6. Wear proper personal protection.
7. Clean the ventilation system.
8. Leave plumbing cleanup to the experts.
9. Air out the building for three to five consecutive days after cleaning.
10. If odor or staining remains, have your home evaluated by a professional.