Report to
The Vermont Legislature

Recommendations for Re-Occupancy of Buildings Previously Used to Manufacture Methamphetamine

In Accordance with Act 75 (2013), *Strengthening Vermont's Response to Opiod Addiction and Methamphetamine Abuse*, Sec. 20

Submitted to: House Committees on General, Housing and Military Affairs; Judiciary; Health Care; and Human Services.
Senate Committees on Economic Development, Housing and General Affairs; Judiciary; and Health and Welfare.

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Executive Summary

This report, written in accordance with Act 75 of 2013, presents an overview of the potential adverse health effects of contamination caused by methamphetamine production as well as recommended standards for re-occupancy of buildings used for this purpose. The types of contaminants, the incidence of contamination in Vermont and cleaning and testing processes are discussed in this report as are the policies and practices of other states. There are no federal regulations for handling residual contamination from methamphetamine labs.

The Commissioner of Health recommends the following guidance for re-occupancy of structures that were previously used in the production of methamphetamine:

1. Structures used to manufacture methamphetamine should be cleaned by professionals with experience in hazardous waste;
2. Once cleaned, these structures should be tested using wipe sampling by someone with expertise in environmental sampling;
3. Structures with methamphetamine residues exceeding 0.1 ug/100 cm^2 should be remediated before re-occupancy is allowed;
4. Vermont should adopt a strategy for notifying prospective tenants and buyers if a structure remains contaminated at the time of rental or sale.

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Introduction

Act 75 (2013), *Strengthening Vermont's Response to Opiod Addiction and Methamphetamine Abuse,* Section 20, requires the Commissioner of Health to research and recommend guidance for re-occupancy of a structure that was previously used in the production of methamphetamine. The number of incidents involving such structures in Vermont has been minimal. The Vermont Hazardous Materials Response Team (VHMRT) estimates that there are about 8-12 found each year in the state, whereas the federal Drug Enforcement Agency (DEA) reports that there were 4 incidents in 2012. The DEA sometimes investigates without the help of VHMRT, which explains the apparent discrepancy.

This report outlines the Vermont Department of Health's (Health) recommendations regarding re-occupancy of a structure previously used for methamphetamine production. It details approaches for identifying housing, standards for re-occupancy, notification to prospective tenants or buyers and identifies how other states treat this issue. It also addresses the public health impacts of long-term exposure to housing that has been used to produce methamphetamine. This report is written specifically for structures used in the production of methamphetamine, but many concepts may also be applied to structures used to manufacture other illicit drugs.

The information used for this report was gathered by conducting a review of scientific literature, examining how other states address the issue and by convening a workgroup to review the information and develop recommendations. The workgroup was composed of representatives of Health, the Department of Environmental Conservation, Vermont Hazardous Materials Response Team, the Department of Public Safety and the Vermont State Police.

Public Health Impacts of Long-Term Exposure to Structures Formerly Used to Produce Methamphetamine

The toxicity and dangers of using methamphetamine are widely documented in the scientific literature. Methamphetamine use presents both acute (short-term) and chronic (long-term) health risks. Methamphetamine is a stimulant and primarily affects the cardiovascular and nervous systems. Symptoms of methamphetamine toxicity in humans include rapid and/or irregular heartbeat, high blood pressure, shortness of breath, high fever, sweating and loss of appetite. Higher doses of methamphetamine can lead to heart attack and death. While it is known that ingestion of methamphetamine is dangerous, it is also recognized that exposure to toxic chemical residue contamination resulting from illicit production of the drug can also have adverse health effects.

The production of methamphetamine involves the use of several ingredients called precursors. Examples of methamphetamine precursors are ephedrine and pseudoephedrine. The production also creates unintended chemicals, or byproducts, many of which are toxic. When drugs are made in controlled laboratory environments, byproducts are removed from the final product. When methamphetamine is made in uncontrolled environments, such as in someone's home, there is a potential for many unintended chemical byproducts to be produced. The type of byproducts depends heavily on the synthesis method. According to the VHMRT, the synthesis method most commonly seen in Vermont is the "one-pot" method. This method produces flammable liquids and vapors, unreacted lithium, and corrosives such as sodium hydroxide. The potential for exposure to methamphetamine, methamphetamine byproducts and methamphetamine precursors in a residential structure depends on the level and proximity of chemical residues and the frequency of contact. Exposure to these chemicals could occur by dermal, ingestion or inhalation pathways.

As with other toxicants in the environment, children are at a higher risk of exposure to residues and may be most affected by methamphetamine residue in a home. Children eat more and drink more per body weight than adults, meaning that any contamination of food and beverages (i.e. from residual contamination in the residence) would result in a greater dose to a child than an adult. Children also exhibit specific behaviors, including hand-to-mouth activity, that could increase exposure to residual chemical contamination.

It is difficult to determine the scope of potential health risks caused by chemicals, including methamphetamine byproducts and precursors, that may be present in a structure used for methamphetamine manufacturing. There is currently no published scientific literature showing long term health effects from exposure to residues from methamphetamine manufacturing. Additionally, research is not available showing specific health effects of residues from methamphetamine manufacture at particular levels of exposure.

Anecdotal reports from families who have moved into structures formerly used for methamphetamine production indicate that symptoms such as headaches, nausea, dry mouth and breathing problems can be experienced within days of occupancy. Many chemicals are used in the manufacturing of methamphetamine and many of these chemicals as well as the byproducts of methamphetamine manufacturing may be more toxic than methamphetamine itself. It is not known whether methamphetamine or residual precursors or byproducts are responsible for adverse health effects reported (anecdotally) after occupancy of a former methamphetamine lab. The knowledge of the level of toxic contamination that production of methamphetamine can create, however, indicates that it is important that structures previously used for producing methamphetamine be properly cleaned and tested before the structure is occupied by individuals and families.

Identification of Structures Used to Produce Methamphetamine

The determination of whether a structure has been used to produce methamphetamine is typically done in conjunction with a criminal investigation. The Vermont State Police, VHMRT, or the U.S. DEA could be involved in identifying potentially contaminated structures. These entities have the ability to make this determination based on evidence collected at the scene, including laboratory-tested evidence. No formal mechanism for sharing information among these entities currently exists because the DEA and Vermont law enforcement agencies maintain separate and distinct databases with limited data-sharing at this time.

Ensuring Safety of Structures Formerly Used for Methamphetamine Production

Cleaning

In order to ensure that a structure previously used for methamphetamine production is suitable for re-occupancy, it needs to be adequately and effectively cleaned and then tested. Environmental testing prior to cleaning may be informative but is not believed to be necessary and may add to the expense of overall remediation. A qualified individual with expertise in hazardous materials such as a certified industrial hygienist, a hazardous materials specialist or an environmental health and safety professional could be employed to clean a contaminated building. Ideally, these parties should also have expertise in identifying and handling asbestos and lead as many Vermont homes contain these hazards and they should be managed appropriately. The Environmental Protection Agency (EPA) offers guidance on its website for cleaning a structure used in the production of methamphetamine: http://www2.epa.gov/sites/production/files/documents/methamphetamine_lab_guidelines.pdf

Testing

After a building has been cleaned, it should be tested for residue. The most widely used method for testing is wipe sampling taken from hard surfaces at or near the site of production within a structure. Any wipe samples should be analyzed by a National Environmental Laboratory Accreditation Program laboratory for the presence of methamphetamine. Methamphetamine would be used as a surrogate for other byproducts and precursors that may also be present. The rationale is that if a surface is cleaned sufficiently for methamphetamine residues, all other potentially harmful chemicals, including byproducts and precursors, will also be removed in the process.

An independent third party without a vested interest in the property is recommended for clearance testing following cleaning. This entity should have expertise in environmental sampling. Guidance for sampling could be developed by Health in consultation with the Department of Environmental Conservation or guidance from other states could be adopted. A building that has been fully cleaned and has either no residue or detectible residue that falls below a specified standard is considered to be remediated. Following remediation, a building can be used or inhabited. Standards for methamphetamine residue detected by wipe sampling are discussed later in this report.

Notification to Purchasers and Tenants

Whether or not owners of properties previously used for the production of methamphetamine have an obligation to notify prospective occupants about the history of the building is a legal issue. In Vermont, there is no such legal obligation. To ensure that occupants are not exposed to meth, meth precursors or byproducts, there are several options. The State Police or another state agency could maintain a list of identified contaminated structures on their website. Once the structure has been properly cleaned, it would be removed from the list based on a final report and wipe sample testing results provided by the consultant contracted to test the property. However, development and maintenance of a database and website would require resources for something that is expected to have limited use as the number of methamphetamine incidents in Vermont is

currently minimal. Another option would be to require, through legislation or regulation, that property owners disclose to prospective tenants and/or buyers that the structure was used to manufacture methamphetamine until it was cleaned. This would put all responsibility for notification on the property owner and could be enforced in a similar manner as other current seller disclosures.

Other States' Policies and Practices for Addressing Buildings Contaminated with Methamphetamine

Wipe Sampling

States differ greatly in the requirements for methamphetamine testing and notification for structures used for methamphetamine production (Table 1). States also vary greatly with regard to the number of methamphetamine lab incidents. According to the DEA, the number of methamphetamine lab incidents in 2012 in Vermont was 4 which is significantly lower than many states; Kentucky had 919, Tennessee had 1,585, Illinois had 801 and Indiana had 1,429 in 2012 (Figure 1). According to the VHMRT database, the Vermont numbers have remained consistent over the past few years, at 8-12 per year. Twenty-two states require cleanup before re-occupancy of structures used to produce methamphetamine. Of those 22, all but one require wipe sampling to determine when cleanup is complete. The 22 states that require cleanup are Alaska, Arizona, Arkansas, California, Colorado, Hawaii, Idaho, Indiana, Kentucky, Michigan, Minnesota, Montana, Nebraska, New Mexico, North Carolina, Oregon, Tennessee, Utah, Virginia, Washington, West Virginia, and Wyoming. The states that require wipe sampling for methamphetamine residue also have screening level standards for detectible methamphetamine residue. Fourteen states use 0.1 ug/100 cm^2; five states use 0.5 ug/100 cm^2, two states use 1 ug/100 cm^2, and six states use 1.5 ug/100 cm^2. There are no federal standards for methamphetamine residues to use as a guide for re-occupancy.

The level of 0.1 ug/100 cm^2 is based on the detection limit capability at the time the screening level was developed. This means this was the lowest level achievable for methamphetamine using the technology available at the time. The detection limit can be much lower now due to advances in technology. There is great uncertainty involved in estimating the risk (exposure and toxicity) posed by chemical residues from methamphetamine manufacturing. There is also uncertainty in knowing which toxic chemicals other than methamphetamine may be present in a structure used for manufacturing methamphetamine. Because of these uncertainties, Health recommends the conservative screening value standard of 0.1 ug/100 cm^2. Based on discussions with other states, professional contractors are able to remediate structures used for methamphetamine production below 0.1 ug/100 cm^2. Health believes this level should provide an adequate margin of protection for re-occupancy.

Because some methods for methamphetamine production create volatile organic compounds (VOC's) such as methanol, ether and benzene, some states require testing and remediation for VOC's. VOCs are typically measured using a photoionization detector (PID). PIDs are carried by many VHMRT and some fire departments, and are widely used to indicate hazardous levels of gases in the air. If the VOC level is tested and is greater than 1 ppm, VDH recommends that the source of the VOCs be investigated to ensure that all VOCs related to methamphetamine manufacturing are removed. Many products within the home, including new carpet and furniture, paints and cleaners can also be sources of VOCs. Some states also require sampling for lead and mercury in former methamphetamine labs. According to the VHMRT team, the current common methamphetamine production method most often seen in Vermont does not use lead and mercury. Therefore, Health does not recommend sampling for lead and mercury in structures used to manufacture methamphetamine.

Notification

Twenty seven states require notification at the time of rental or sale for properties that have been used for methamphetamine production. Those 27 states are: Alaska, Arizona, Arkansas, California, Colorado, Illinois, Indiana, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Utah, Virginia (effective 7/1/14), Washington, West Virginia, and Wyoming. Of these 27, eight states require notification until the property has been cleaned (Arizona, Arkansas, California, Colorado, Indiana, Kentucky, Montana and Utah); two of the states do not require notification at the time of sale, but list the property on a list of contaminated sites (Michigan and Tennessee); and one state adds a note to the property title (Oregon).

Recommendations

Based on the results of Health's research and discussion with the informant workgroup, the following are presented as recommendations for buildings in which methamphetamine was produced:

1. Structures used to manufacture methamphetamine should be cleaned by professionals with experience in hazardous waste;
2. Once cleaned, these structures should be tested using wipe sampling by someone with expertise in environmental sampling
3. Structures with methamphetamine residues exceeding 0.1 ug/100 cm^2 should be remediated before re-occupancy is allowed;
4. Vermont should adopt a strategy for notifying prospective tenants and buyers if a structure remains contaminated at the time of rental or sale.

Table 1: Requirements in other states for structures used to manufacture methamphetamine

state	cleanup required?	testing required?	meth standard (ug/100 cm^2)	legislation?	notification for rental or sale?	who cleans up?
Alabama	N	N		N	N	
Alaska	Y	Y	0.1	Y	Y	Property owners permitted
Arizona	Y	Y	0.1	Y	Y- until clean	Certified Contractor
Arkansas	Y	Y	0.5		Y- until clean	Certified Contractor
California	Y	Y	1.5	Y	Y- until clean	Certified Contractor
Colorado	Y	Y	0.5	Y	Y-until clean	Certified Contractor
Connecticut	N	N	0.1	N	N	Property owners
Delaware	N	N		N	N	
Florida	N	N		N	N	
Georgia	N	N		N	N	
Hawaii	Y	Y	0.1	Y	N	Contractor must specialize in cleaning but doesn't have to be certified
Idaho	Y	Y	0.1	Y	N	Cleaning contractor does not have to be certified but a qualified industrial hygenist is required to ensure that stste standards are met.
Illinois	N	N	1.5*	Y-disclosure	Y	Person convicted and responsible for manufacturing is liable for costs.
Indiana	Y	Y	0.5	Y	Y- until clean	Certified Contractor
Iowa	N	N			N	
Kansas	N	N	1.5	N	N	
Kentucky	Y	Y	0.1	Y	Y- until clean	Certified Contractor
Louisiana	N	N		Y-disclosure	Y	
Maine	N	N		N	N	
Maryland	N	N		N	N	
Massachusetts	N	N		N	N	
Michigan	Y	Y	0.5	Y	N-but property is listed on a state contaminated property list permanently and will indicate when it decontaminated	Certified Contractor
Minnesota	Y	Y	1.5*		Y-must disclose on sale	HazMat contractors
Mississippi	N	N		N	N	
Missouri	N	N		Y-disclosure	Y	
Montana	Y	Y	0.1	Y	Y- until clean	Certified Contractors
Nebraska	Y	Y	0.1	Y	N	Property owner is permitted to clean up.
Nevada	N	N		Y-disclosure	Y	
New Hampshire	N	N	0.1	Y -disclosure	Y	
New Jersey	N	N		N	N	
New Mexico	Y	Y	1	Y	Y	Certified Industrial Hygienist
New York	N	N		N	N	
North Carolina	Y	N	0.1		N	Meth manufacturer is responsible for clean up but property owner is permitted to clean up.
North Dakota	N	N		Y -disclosure	Y	
Ohio	N	N				
Oklahoma	N	N		Y- disclosure	Y	
Oregon	Y	Y	0.5	Y	on property title	Contractor licensed by state
Pennsylvania	N	N		N	N	
Rhode Island	N	N		N	N	
South Carolina	N	N		N	N	
South Dakota	N	N	0.1	Y- disclosure	Y	
Tennessee	Y	Y	0.1	Y	N - but added on the state contaminated property list.	Certified Contractor
Texas	N	N		N	Y	
Utah	Y	Y	1	Y	Y- until clean	Certified Specialist
Vermont	N	N			N	
Virginia	Y	Y	1.5	Y	Y (effective7/1/14)	Contractor or other qualified professional
Washington	Y	Y	0.1	Y	Y	Certified Contractor
West Virginia	Y	Y	0.1	Y	Y	
Wisconsin	N	N		N	N	
Wyoming	Y	Y	1.5	Y	Y- unihabitable property can only be sold with full disclosure	Certified Contractor

Figure 1: Number of methamphetamine incidents in 2012 (DEA database)