Breaking Bad

How clean is "clean" when it comes to property damage and the health side effects associated with illicit meth labs?

BY KIRSTEN HOEDLMOSER

The federal government estimates that between 560 and 1,400 clandestine amphetamine synthesis operations exist across Canada. These 'labs' can produce a variety of illicit substances in the amphetamine family including methamphetamine or ecstasy/MDMA, and have been discovered both in urban and rural settings. While insurers and adjusters have become more aware of residential marijuana 'grow ops,' little attention, so far, has been paid to meth labs.

In July 2013, Ontario Police discovered and seized $40-million worth of methamphetamines (meth) in three separate labs. The health effects of the drug on its users are generally well understood and a large portion of the general public is already aware of the damaging impact of meth use. One aspect of meth production often overlooked, however, is the property damage caused by these clandestine operations and the potential harm to the health of individuals who occupy a former meth lab.

These concerns are very real. Short-term health problems attributable to exposure to the latent products of chemical synthesis have been well-documented and include headaches, nausea, respiratory difficulties, skin irritations and burns. Severe health problems in infants and children exposed to even trace amounts of chemical residues are well documented. Children are especially vulnerable to these impacts due to their frequent hand-to-mouth behaviour. While long-term effects are not yet well understood, studies suggest that chemicals within meth and within the precursor chemicals used to synthesize such drugs may cause cancer in humans.

Synthesizing, or 'cooking', meth involves combining many precursor chemicals including acetone, insecticides, and pseudoephedrine. The specific chemicals used vary according to the cooking method. Regardless of the method used, the act of cooking meth releases potentially toxic chemicals that can migrate far beyond the immediate cooking area within a building, contaminating walls, carpet, curtains, furniture, plumbing, ducting, and the air itself. A property used as a lab can essentially be considered a hazardous waste site, with impacts even extending outdoors if chemicals or by-products were dumped on the surrounding ground surfaces.

Within the building, porous materials such as fabrics and carpet can easily be removed during remediation of a meth lab. But how does a building owner know that the non-porous surfaces have been adequately cleaned? How does the future occupant know that they won't be breathing toxic air within the building or come into contact with residual surface contaminants? Cleaning and remediation procedures for the restoration of properties used as meth labs are relatively consistent between guideline documents; however, the acceptable post-remediation clearance limit for residual meth surface concentrations vary widely amongst current standards.

Within Canada, few guidelines exist for the remediation of buildings used for the synthesis of illegal substances. Unfortunately, this leaves both environmental consultants and remediation contractors in a regulatory void where the application of inappropriate or inadequate remediation and clearance standards can have significant impacts on human health. Though the Canadian National Collaborating Centre for Environmental Health has produced a set of remediation guidelines derived from instructions and regulations within the United States, Australia, and New Zealand, there are no quantitative limits definitively stating acceptable post-remediation conditions.

In the absence of defined clearance criteria, we may look to American state legislature, as well as further abroad, for guidance in these matters. In The United States, no formal federal regulations exist governing the remediation of meth labs. Rather, regulations are developed and implemented by individual states. The Environmental Protection Agency (EPA) has a set of voluntary guidelines for meth lab remediation, which includes conducting pre-remediation surface sampling to determine the extent of the chemical contamination, the sequence of remediation steps, best practices for remediating certain building finishes, and post-remediation sampling to confirm that the chemical contaminants have been successfully removed.

This EPA guideline acknowledges that as of 2009, 22 states require or recommend specific quantitative meth remediation standards. These standards for acceptable meth surface concentrations range from 0.05 ug/100 cm2 to 1.5 ug/100 cm2, with the most common limit being 0.1 ug/100 cm2. This guideline does not, however, provide direction on whether any of these state-legislated limits should be altered to be any more or less stringent.

It is important to note that the EPA guidelines acknowledge that these state-specific limits are determined according to laboratory detection limits, not health-based criteria. That is to say, these standards are conservative limits that should account for the analytical uncertainty of remediating a meth lab where the sampling location can have a significant impact on the analytical results returned.

Quantitative standards have been developed by many states for evaluating other contaminants of concern associated with a clandestine meth lab, and, to further complicate the issue, sampling for these contaminants may depend on what meth cooking method was used within the lab. These standards apply to volatile organic compound (VOC) concentrations in air, corrosives, lead, mercury, and iodine, among others. Much like the standards for surface meth concentration, the quantitative limits vary widely by state.

Depending on the limit used, a photoionization detector, commonly known as a PID, can determine if an acceptable concentration has been achieved within the ambient air. Use of this device can help in avoiding further analytical costs in determining if a former meth lab has been appropriately remediated. However, such a device is unable to identify what specific chemical constituents exist in the air and in what quantities. In some situations, a PID screening may not be sufficient for assessing the air quality of the building.

Many states have set an acceptable surface pH range of between 6 and 8, pH being a measure of corrosiveness.[5] Care must be taken to determine whether the sampling surface itself is inherently corrosive. For example, concrete is classified as alkaline (i.e. has a pH greater than 7), and thus sampling on concrete may in some cases give a falsely high pH reading during clearance sampling.

To further complicate matters, certain states sometimes include guidelines or legislation regarding sampling for specific chemicals which may be present as a result of the cooking method employed within the lab. Colorado, for example, requires clearance testing for iodine, as well as lead on surfaces and/or in the air depending on the cooking method used Minnesota requires sampling for lead but also requires sampling for mercury. Each state has differing acceptable concentration limits.

When remediating a building used as a meth lab, it is crucial to evaluate what standards should be used to ensure the building is safe for future occupants, while also controlling remediation costs.

As the outcome of the post-remediation clearance sampling can be greatly affected by the sampling locations chosen, it is crucial for an unbiased party to conduct the sampling to remove the risk of a biased assessor selecting locations that are more likely to yield a 'pass' than others. Post-remediation clearance sampling can be done by collecting samples from random locations throughout the building, or alternatively by sampling in the location most likely to have the highest chemical contamination levels (i.e. the most difficult to clean area, or the area where the cooking took place). In this case, a third party may be useful in inspecting the work area.

When remediating a building used as a meth lab, it is crucial to evaluate what standards should be used to ensure the building is safe for future occupants, while also controlling remediation costs.

In the absence of Canadian federal or provincial legislation in this area, a qualified and experienced consultant, public health official, and/or hygienist should provide guidance to the cleaning and remedial contractor. This will ensure that the building can be confirmed as safe for re-occupancy and that the proper range of both surface residual and airborne contaminants are considered. Although such a diverse, and at times conflicting, range of regulatory guidelines exist, leaders in this industry must rise to the challenge to protect public health and safety.

Kirsten Hoedlmoser is a Chemical and Environmental Engineer-In-Training at Giffin Koerth Forensic Engineering. She specializes in complex site assessment and remedial projects involving all forms of contamination.