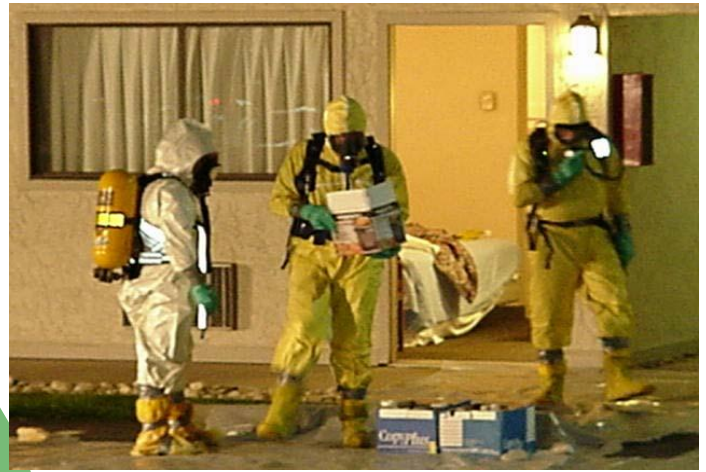


Clandestine Drug Laboratory Remediation:

A Guide to Post Emergency Response

Removal Action Focus Group



October 2006

Acknowledgements

This document was prepared by the ASTSWMO Removal Action Focus Group, with assistance from the U.S. Environmental Protection Agency under Cooperative Agreement R-829817.

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In addition, the Focus Group wishes to thank Debbie Libby of New Hampshire DES, for development of the front cover of this report, and staff of the National Alliance for Model State Drug Laws for their assistance in this project.

Table of Contents

	Page
Abstract	1
Introduction	1
Purpose	2
Overview of Issues	3
I. Discovery and Initial Response Actions	5
Law Enforcement Action.....	5
Notification to Environmental Agencies	6
Emergency Removal Action	7
Waste Disposal.....	7
II. Actions and Issues Beyond First Response	7
Time Critical Removal Actions.....	7
Uncertainties Associated with Developing Cleanup Levels	9
Certifying Contaminated Homes Are Clean and Safe to be Reoccupied....	10
Funding	13
Additional Considerations.....	15
Kansas Meth Watch Program.....	15
III. Removal Case Studies at Clandestine Lab Sites	16
Meade Valley Super Lab, CA	16
Silverton Methamphetamine Lab, OR.....	19
Conclusions	21
Attachments	22

Clandestine Drug Laboratory Remediation: A Guide to Post-Emergency Response

Abstract

In recent years, there has been a marked increase in the number of clandestine drug laboratories (labs). In particular, the number of clandestine labs dedicated to methamphetamine production has skyrocketed in the western and central States. The epidemic is spreading east and south, and States in those parts of the country are experiencing a dramatic increase in the number of methamphetamine labs.

This document focuses on the environmental issues and available reference resources for State hazardous waste remediation and removal programs as related to clandestine drug lab response. By identifying these issues and some States' clandestine lab cleanup practices and experiences, this document will be useful to States that are currently developing or expanding their capabilities for drug lab response.

This document generally describes the processes that various governmental agencies commonly use to conduct initial response actions at clandestine drug labs. It also addresses issues that State or other environmental agencies should consider in addressing the final remedial actions that are necessary to protect public health and the environment. These include notification and coordination among agencies, cleanup levels and protocols for buildings and environmental media, procedures for assuring that buildings are properly cleaned up before they are reoccupied, and program funding.

This paper explores each of the above issues in more detail, and includes case studies to illustrate the breadth of environmental response actions required at abandoned drug labs. Also included are the results of research conducted regarding State drug lab response programs, e.g., specific State funding sources, sampling protocols, cleanup standards, decontamination protocols, waste disposal requirements, reoccupation requirements, cleanup oversight, and contractor certification requirements. Various references and sources for additional information are provided, including information from States that have recently passed legislation and rules concerning clandestine drug labs, and from States that have extensive experience in dealing with the remediation of abandoned drug labs.

Introduction

This document focuses on the environmental issues and available reference resources for State hazardous waste remediation and removal programs regarding clandestine drug lab response. By identifying issues and describing

some States' practices and experiences, the document should be of use to States currently developing or expanding their programs for drug lab response.

Members of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) Removal Action Focus Group, one of 6 research oriented programmatic focus groups under the auspices of the ASTSWMO CERCLA and Brownfields Research Center, authored this document and performed the research herein. ASTSWMO is a national, non-partisan and non-profit organization composed of State and territorial hazardous and solid waste personnel, remediation program managers, and their staff. ASTSWMO's mission is to enhance and promote effective State waste management and remediation programs, and affect national waste management and remediation policies.

By design, membership in the ASTSWMO Removal Action Focus Group is representative of the regional construction of the United States Environmental Protection Agency (US EPA), with each member representing his/her Region and the States within that Region. Each member is responsible for communication and coordination with the other Regional States, and for incorporating the knowledge, experiences, and concerns of those States into the research conducted by the Focus Group. The Focus Group is also aided in its research efforts by a liaison from US EPA's Office of Emergency Management, which funds the Focus Group's research work.

This document provides practical suggestions and available reference resources for use by State remedial and removal programs in their response to clandestine drug labs. It is not intended to be a comprehensive document addressing all problems associated with illegal drug labs. This document does not establish any official opinions, positions, preferences, or recommendations by ASTSWMO or by any individual ASTSWMO member or their respective State or Region.

Note the terms "removal" and "remediation" can have a variety of meanings to different jurisdictions and agencies. In the context of this document, a first response and gross removal action is conducted when wastes, precursor chemicals, laboratory equipment, and vessels are removed and managed for disposal. Remediation is an action or actions intended to meet a cleanup goal for soil, groundwater, or air. Remediation can also mean the actions conducted in a building interior to allow reoccupancy.

Purpose

The purpose of this paper is to identify issues associated with the cleanup of clandestine drug labs, and to provide resource information to State agencies regarding the development of cleanup programs to address these sites. A summary of typical first response actions at clandestine labs is provided, along with a discussion of some of the shortfalls associated with the initial response. This paper also discusses cleanup and other actions needed beyond the initial

response, and provides a list of resources available for States developing programs to address the cleanup of clandestine labs.

Overview of Issues

For many years, people have been manufacturing illegal drugs in clandestine labs. In recent years, the number of clandestine drug labs dedicated to methamphetamine production has skyrocketed in the western and central States. The epidemic is spreading eastward, and States in the East and South are experiencing a dramatic increase in methamphetamine labs. (See a map depicting the number of incidents in the United States for 2006 at: http://www.dea.gov/concern/map_lab_seizures.html). While in California, the total number of labs seized per year actually decreased between State fiscal years 2001/2002 and 2004/2005, the production capacity of the drug labs seized remains high.

The manufacturing of illegal drugs creates large amounts of hazardous and solid wastes. As an example, for every pound of methamphetamine produced, there are approximately 5 to 6 pounds of hazardous waste generated. Solvents, metals, acids, and bases are used in the manufacturing process. (See the following web link for a list of typical chemicals found at lab sites: <http://dec.co.riverside.ca.us/fyi/hazards.htm>.) Most of the chemicals for the manufacturing process are obtained from local retailers. The clandestine lab operator disposes of the used or spent chemicals in various manners. The chemicals are typically dumped down the sewer, onto the ground, or into waterways. Sometimes the chemicals are never dumped but are stored at the lab until it is discovered.

Local, State, or federal law enforcement officials are usually the first to respond to a clandestine drug lab. In some States, law enforcement agencies or their environmental contractor may or may not conduct an initial removal of hazardous substances and wastes. However, residual contamination may exist at the site and State and/or local environmental regulators should be notified so they can ensure that public health and the environment are protected. There is a large degree of variability among States and State agencies regarding if, when, and how this notification occurs, and the information communicated to environmental agencies about removal actions already conducted at the site is often incomplete. When first response and gross removal actions have been performed by law enforcement, follow-up response is still necessary to ensure the affected properties and the surrounding environment are safe for reuse.

State environmental agency personnel who respond to an illegal drug lab need to consider the amounts and types of hazardous wastes at the site, what media (i.e., air, soil, ground water, surface water) are or could be affected, and waste disposal options. They also need to consider the extent to which solid wastes such as carpeting, wallboard, drapes, furniture, and clothing are contaminated.

Following the necessary removal and remedial actions, State programs should make a determination as to whether the property is safe for reuse.

In many States there are no rules or regulations concerning the residual contamination within buildings, although the number of States adopting regulations or guidance has been increasing. Health-based cleanup levels do not exist for many of the illegal drugs and associated chemicals including methamphetamine. There are many uncertainties associated with developing cleanup levels for the clandestine labs and determining when homes and buildings housing former clandestine labs may be reoccupied.

In States where there is no direct funding to environmental agencies for clandestine drug lab response, the agencies are forced to rely on existing federal and State funding sources. Federal funding to support cleanup activities is limited to emergency response activities and initial removal actions. Some program enhancement money is available through federal Brownfields grants, but funding sources for cleanup are often in competition with all other State contaminated site cleanup needs. As an example of the cost of cleanup, in calendar year 2004, the Kansas Department of Health and Environment (KDHE) responded to 204 methamphetamine labs at a cost of approximately \$1,100 per site. Larger labs called "super labs" can increase the response cost to over one hundred thousand dollars per site. In 2005, California seized 29 of the 38 reported super labs in the country.

Regarding the development of State programs to respond to these issues, the following considerations are explored in this paper (see also Attachment A):

- Is the State environmental agency responsible for overseeing the cleanup and remediation at clandestine drug labs?
- Is the environmental agency being notified of the clandestine lab?
- Who determines when the site is clean or if additional sampling or removal actions are required?
- What standards are used for cleanups? Methamphetamine or other drugs may be considered environmental contaminants. Most environmental agencies have cleanup levels for solvents, acids, bases, and metals. However, health-based cleanup standards for illegal drugs commonly do not exist.
- What sampling and laboratory protocols are utilized? Sampling techniques and laboratory methods for methamphetamine or other illegal drugs are not standardized and have limited availability.

- How are the hazardous materials present at illegal labs being disposed? Several States have their own disposal programs; some use the Household Hazardous Waste Program for disposal, and some States use hazardous waste contractors.
- How are contaminated homes certified clean and safe to be reoccupied?
- What are the roles of various government agencies? There is a large degree of variation from State to State regarding agency structure and responsibility. The various roles of federal, State, and local agencies can change from State to State and lead to a lack of clarity in responsibility for remediating building interiors and contaminated media.

This document focuses on the environmental issues related to clandestine drug labs. Section I of this document generally describes the processes that various governmental agencies commonly use to conduct initial response actions at these sites. Section II addresses the issues that State or other environmental agencies should consider in addressing the final remedial actions that are necessary to protect public health and the environment. It must also be recognized that this subject involves many related social, economic, legal, and psychological issues. Some references to these and other issues are included within the reference and resource portion of this paper (see Attachment B).

I. DISCOVERY AND INITIAL RESPONSE ACTIONS

Law Enforcement Action

Drug labs are typically discovered through law enforcement actions, but sometimes labs are discovered accidentally. Law enforcement usually gains access to a clandestine lab by a warrant. The warrant remains open as long as law enforcement personnel remain at the site. Therefore, the hazardous waste removal action can be facilitated if it happens while the warrant is open.

The removal of hazardous wastes needs to be coordinated between the law enforcement agency and the State environmental response agency. The law enforcement agency needs to process the site and collect evidence. After these activities are completed, the law enforcement agency will often turn the site over to a Drug Enforcement Agency (DEA) designated environmental contractor or a State environmental response agency for cleanup of the hazardous waste. The coordination of the law enforcement actions and the first response hazardous waste removal actions needs to happen early in the event to allow adequate cleanup and removal time.

Early coordination between law enforcement and the State environmental agency is key for successful and complete cleanup.

Notification to Environmental Agencies

Local law enforcement officials or the DEA are usually the first responders to the discovery of a clandestine drug lab and may or may not conduct an initial removal of hazardous substances and wastes. However, residual contamination may still exist after the first responder conducts his/her work, and State and/or local environmental regulators should be notified so they can assure that public health and the environment are protected. Sufficient information should be provided to the State environmental agency so that regulators understand the location and history of the site and the potential residual contamination that may remain.

The DEA uses the National Clandestine Laboratory Seizure Report (EPIC form 143) to gather information on lab, chemicals and equipment, and dumpsite seizures, for law enforcement purposes. The data is intended to provide information on the types, numbers, and locations of labs seized, manufacturing trends, precursor and chemical sources, and people involved. The EPIC report format provides for consistent reporting of the nature of the activities, including the location, type of operation, and chemicals involved. (See Attachments C and D, i.e., [EPIC form](#) and [EPIC instructions](#), for more information.)

The EPIC form does not provide all of the information that would be useful to environmental agencies to determine if additional remedial actions are necessary. Additional information that would be useful includes:

- removal activities already conducted (including removal of building materials and soil or other environmental media);
- any known, apparent, or potential residual environmental contamination (including inside buildings and residences);
- apparent or potential locations of chemical disposal (including disposal to soil, sewer, and septic systems);
- the results of any environmental sampling that was conducted; and
- whether buildings have been or will be reoccupied.

A summary of the notification process in Texas is provided as an example of how one State has established protocol for interagency coordination. In Texas, a local law enforcement entity (e.g., local police department, Sheriff's office) will verbally contact a local narcotics task force or the Texas Department of Public Safety's (TXDPS's) narcotic task force for assistance. It is important to note that unless a local law enforcement entity contacts TXDPS, no State or federal funding will be available for that local entity to address cleanup issues. In cases where this contact and reporting does not occur, the local law enforcement entity becomes the generator of all waste materials for disposal and is therefore responsible for the costs. This notification requirement is for releases of drug lab hazardous chemicals only. The State does not have an established mechanism for notification to the Texas Commission on Environmental Quality (TCEQ). However, TCEQ can, under certain circumstances, initiate a State-funded

response in order to remove materials which appear to have been generated by a clandestine drug lab, if the materials have been illegally dumped into a right-of-way or on a property and the materials pose an imminent threat to human health or the environment.

Emergency Removal Action

The DEA has an environmental contractor that will respond to clandestine drug lab sites if requested by a law enforcement agency. The DEA contractor will remove all the hazardous wastes from the site, however, the DEA contractor will not remove or sample grossly contaminated carpeting, wallboards, clothing, etc., and will not perform removal actions for contaminated soil, groundwater or surface water, or sample affected environmental media. The DEA contractor will not make any decisions regarding the long-term use of the contaminated house or structure. Because sampling and removal are likely necessary, it is therefore important that the State environmental agency be notified and involved.

Waste Disposal

Much of the waste discovered at an illegal drug lab can be reacted or neutralized at the site. Small amounts of acids and bases can be neutralized; small amounts of reactive metals like sodium or lithium can be reacted in water. Anhydrous ammonia can be off-gassed into water and applied as a fertilizer. Many of the hazardous materials may be rendered non-hazardous by reacting or neutralizing the material. The local sanitary sewer may be used for disposal of some of the reacted or neutralized waste with permission from the municipality. Solvents can be categorized, and like solvents can be bulked together for shipment to a waste disposal facility.

Bulking of wastes saves money.

Several States have set up storage facilities for collecting and storing hazardous wastes from the numerous clandestine lab sites discovered. Periodically, personnel consolidate and profile the wastes stored in drums, and the contents of the drums are disposed per normal hazardous waste disposal requirements. Bulking the hazardous wastes in this manner saves money.

II. ACTIONS AND ISSUES BEYOND FIRST RESPONSE

Time Critical Removal Actions

Time Critical Removal Actions (TCRAs) should be considered when contaminated materials or media remain at the site after the first response, and the gross removal action has been completed. (Note for purposes of this report, TCRAs are defined as the actions taken after the warrant has closed and law enforcement personnel have left the site.) TCRAs should consider contaminated

soils, trash pits, septic tanks, buried tanks, groundwater, drinking water wells, and the house or structure that the lab once occupied. An access agreement for these removal actions will be needed unless the warrant remains open. Again, timing of these actions with the emergency response is critical.

The size of the clandestine drug lab will often dictate which actions are necessary and appropriate following discovery. Typically, smaller labs require very little follow-up removal actions unless there are special circumstances. A more aggressive removal action may be necessary if the lab was large, generating hundreds of pounds of waste. A large clandestine lab site may become a contaminated site requiring a removal assessment or a site investigation.



The following is an example of a TCRA in the state of Kansas, where the KDHE Clandestine Laboratory Cleanup Program has the responsibility of cleaning up all clandestine drug labs.

Anhydrous Ammonia Tank Removal by KDHE

Law enforcement personnel discovered someone had stolen and buried a full anhydrous ammonia tank in a remote location in Cowley County, Kansas. Anhydrous ammonia is one of the ingredients for making methamphetamine. It is caustic and causes severe chemical burns. The ammonia tank was buried in a tree line with only the valves exposed. The response crew donned appropriate personal protective equipment and transferred the anhydrous ammonia into an empty tank. The Winfield Fire Department supplied water and standby fire and rescue services for the response crew during the transfer process.

Approximately 600 gallons of liquid anhydrous ammonia was transferred to the new tank. Later, the crew used excavation equipment to dig up the buried empty tank. The operation took 2 days to complete because of the remoteness of the site and the high risk to response personnel. The recovered anhydrous ammonia was sent to the Winfield Coop where it was used for its intended purpose as a fertilizer.

If this tank had failed and released the 600 gallons of anhydrous ammonia to the soil and groundwater, a large amount of groundwater could have been contaminated. KDHE was able to avoid this potential contamination by a quick and effective removal action.

In calendar year 2004, KDHE responded to 204 clandestine drug labs. KDHE performed TCRAs at 7 of those sites; all were soil removals due to contamination from the clandestine labs.

TCRAs were needed at 3.4% of the clandestine drug labs addressed by KDHE in 2004.

Uncertainties Associated with Developing Cleanup Levels

Neither EPA nor States have developed health-based cleanup levels for some of the substances associated with clandestine drug labs. Although chemicals such as metals, acids, bases, and solvents are commonly addressed at hazardous substance release sites and have health-based action levels developed by EPA/States, health-based cleanup levels have not been developed for key chemicals such as methamphetamine.

There are many sources of uncertainty related to the development of health-based cleanup levels for clandestine drug/methamphetamine labs. This discussion addresses some uncertainties that must be considered when developing cleanup standards for the potential residual impacts after an active lab has been decommissioned.

The exposure assessment is a critical component in the development of cleanup levels for clandestine drug lab-related chemicals. Unfortunately, there are many sources of uncertainty in these estimates. Chemical toxicity levels for human exposure are typically based on national statistics or professional judgment. There is currently limited information available regarding the toxicity associated with residual contamination at drug labs. It is difficult to estimate a toxic dose for exposure from oral ingestion, let alone for other potential exposure pathways such as inhalation, dermal contact, neonatal, or nursing infant exposure.

Exposure estimates are also challenging due to uncertainty regarding the distribution of contamination throughout a property. EPA and other federal agencies have not established toxicity values for methamphetamine via any exposure route. There is a significant amount of information regarding pharmacological and illicit use of methamphetamine, but there is little information about chronic exposure. There is also a lack of data regarding the potentially interactive effects of different chemicals with methamphetamine, including possible synergistic or antagonistic effects.

Uncertainties in the development of cleanup standards for methamphetamine and other chemicals commonly found in illicit drug labs are further complicated by potential inconsistencies in sampling and analytical methodologies. In most cases, cleanup standards (both qualitative and quantitative) are feasibility-based rather than risk-based for the predicted exposure scenarios. Quantitative cleanup standards may be based on the ability of the analytical equipment to detect the chemical. Qualitative cleanup standards may be limited by the impracticality of

removing contaminated materials that affect the structural integrity of a building, or by cleanup costs that exceed the value of the property.

Many States have developed both performance-based (i.e., qualitative) and numerical (i.e., quantitative) cleanup standards for methamphetamine. Performance standards usually include removal of areas with noticeable staining (e.g., wallboard and carpet), and water and detergent cleaning of the remainder of the contaminated property. Numerical cleanup standards require cleanup to established levels and confirmation sampling to assess the effectiveness of the cleanup. Many States have existing cleanup standards for some drug lab wastes and precursor chemicals such as lead, mercury, and VOCs. Some States have also established cleanup standards for precursor chemicals such as ephedrine, pseudoephedrine, iodine, and red phosphorus. Several States have adopted a standard of 0.1 microgram per 100 square centimeter (0.1 $\mu\text{g}/100\text{ cm}^2$) for methamphetamine on building interior surfaces. The Colorado Department of Health has published a report that compares existing information about methamphetamine to the technology based cleanup levels that have been adopted by some States. This report provides a more detailed analysis of the uncertainties discussed above and can be located at: <http://www.cdphe.state.co.us/hm/methlabcleanuplevelsupport.pdf>.

All of these uncertainties must be considered during the development of standards for the cleanup of clandestine drug labs. Each State must carefully consider these factors and identify the approach that is best suited for their individual circumstances.

Certifying Contaminated Homes Are Clean and Safe To Be Reoccupied

Law enforcement officials may post warning signs on properties used for methamphetamine production advising property owners and/or residents that there could be residual contamination that may pose a threat to human health. In some States, properties are “quarantined” by the local law enforcement agencies until decontamination activities are completed and adequately documented. (See



Attachment E for examples of placards from Kansas, Wisconsin, and Illinois.) As of the date of this report, 7 States have developed, and 2 States are currently developing, protocols for re-entry/reoccupation of residences or buildings where methamphetamine was once produced.

Example of a Placarded Home in Kansas

Other States simply notify the property owner in writing that a clandestine lab was discovered and the property cannot be reoccupied until it is certified to have been decontaminated. Some States even place a notice in the property deed records to warn prospective purchasers of potential hazards from residual contamination. In some States with established clandestine lab programs that deal with residual contamination issues, property owners are required to hire a certified contractor to decontaminate former clandestine labs, to prepare adequate documentation, and require that the State/local authority review and sign the decontamination documentation before such properties can be reoccupied. Nine States are reported to have contractor certification programs (see Attachment A). However, in many States there are no rules or regulations concerning residual contamination within buildings, nor are there regulations concerning when former clandestine labs may be reoccupied.

In calendar year 2004, KDHE placarded 17 homes that were contaminated so badly they required additional cleanup before they could be reoccupied. 8.3% of the homes required additional cleanup prior to reoccupation.

In North Carolina, when law enforcement officials post a notice on a property signifying that the property was used as a clandestine/methamphetamine lab,



they are also required to immediately notify the local health department of the presence of the lab. The local health department is required to immediately inform the property owner of record or their agent that the property was used as a methamphetamine lab, must be vacated, and must be remediated in accordance with the State of North Carolina's decontamination requirements prior to the property being reoccupied.

Contaminated Countertop in Residential Lab

In Tennessee, any property or structure where manufacturing of a controlled substance such as methamphetamine has occurred, may be quarantined by the local law enforcement agency where the property is located. Law enforcement officers are also responsible for posting signs indicating the property has been quarantined, and to notify all parties having any right, title, or interest in the quarantined property. Once the property has been quarantined, any party having a right, title, or interest in the quarantined property may contact either a certified industrial hygienist or a qualified contractor to determine whether hazardous

waste is present on the property and/or to clean up and remove all hazardous waste from the property. The property must remain quarantined until the certified industrial hygienist or qualified contractor certifies to the quarantining agency that the property is safe for human use.



Corroded Ventilation Fan

Many States have developed regulations, cleanup standards, guidance documents, best management practices, and other informational materials that provide protocols for conducting the cleanup of clandestine drug labs. The informational materials developed by some States cover all phases of cleanup:

- emergency response and cleanup of bulk chemicals;
- methods to identify potential areas where chemicals may have been used and released;
- decontamination procedures for building contents and interior surfaces;
- methods to identify and remediate releases to soil and groundwater;
- procedures for final decontamination; and
- rules governing certification of structures for reoccupancy.

The regulations, cleanup standards, and guidance materials mentioned above are used in some States to complement State programs that require cleanups to be performed by licensed, qualified professionals.

The range of detail contained in the attached documentation of cleanup procedures will vary from State to State, and reflects to some extent the State's experiences with the problem of clandestine drug lab cleanups, the date of last revision to the State's regulations/guidance documents, and the resources available to the State. Some States have developed numeric cleanup standards

for an extensive range of contaminants and detailed sampling protocols. (Refer to Attachment A for State specific information.)

Listed in Attachments A and B are references to agencies that have experience with clandestine drug lab cleanups. Most of the agencies have websites with additional information. Additional information contained in the websites includes health effects of various chemicals, prevention programs, reporting information, statistics, and other general information.

Funding

Funding for the cleanup of clandestine labs is an important issue. As an example, in calendar year 2004, KDHE responded to 204 methamphetamine labs at a cost of approximately \$1,100 per site. Larger labs called “Super Labs” can increase the response cost to several hundred thousand dollars per site. Funding for clandestine lab response is commonly from the State’s general funds, and therefore is often in competition with all other State site cleanup needs. Federal funding is limited to US EPA Superfund removal money, pre-CERCLA site investigation funding, and there is some program enhancement money available from Brownfields. (See www.epa.gov/brownfields for more information on how Brownfields grants can be used to address clandestine drug labs.)

Many States have drug lab programs in various stages of development. Some States have only developed guidelines to assist in dealing with the issue, others have proposed legislation, and some have established laws and rules with formal, structured programs. Often, local or State agencies have funding and programs to implement the initial drug response and gross removal actions, but remediating the site to reduce exposure to levels that allow reoccupancy and protect public health and the environment is not addressed. California, for example, provides funding for initial removals but has not established a remedial program. However, recent legislation has provided funding for California environmental agencies to establish health-based cleanup levels and guidance for methamphetamine labs, and cleanups will be overseen by local agencies.

Most States have not been provided with additional funds to develop drug lab response programs. States are usually forced to rely on federal and State funding sources for existing cleanup programs, in order to pay for drug lab response programs and cleanup activities. Drug lab cleanups are forced to compete for funding with all other State site cleanup needs and often do not fare well. States may be reluctant to fund any drug lab cleanups because there are so many and it could set a difficult precedent. Private property owners can also be required to pay for the cleanup of their properties, but their resources are also often inadequate and require additional State resources and expenditures to obtain complete remediation. In general, State governments have not been provided the financial resources necessary to develop drug lab programs and adequately implement cleanup of these sites.

In Utah, no additional funding was provided for the State to develop and maintain its clandestine drug lab program. The program is structured such that program administration duties are divided between the Department of Environmental Quality (DEQ), Department of Health, Department of Public Safety, and Local Health Departments (LHDs), and each agency absorbs their expenses using existing resources. The DEQ was responsible for development of Utah's contractor certification program for cleanup contractors, and was able to use State Response Program (Brownfields) funding that was provided through a cooperative agreement with US EPA. The Department of Health was responsible for development of cleanup standards. The Department of Public Safety is responsible for reporting the discovery of clandestine drug labs to the LHDs, and the LHDs are responsible for monitoring the actual cleanup work to ensure compliance with State law. By distributing the duties among the various agencies it was easier for each agency to absorb the costs. In Utah, there is no funding mechanism for the actual cleanup of contaminated properties. Expenses associated with cleanup are the responsibility of the individual property owner.



Children's Bunk Bed Inside Residential Methamphetamine Lab

In Georgia, a State with no formal drug lab program, drug labs may be handled like any other potential hazardous waste site. The Georgia Environmental Protection Division can use money from the Georgia Hazardous Waste Trust Fund to cover the costs of investigation and cleanup at a drug lab site. The Hazardous Waste Trust Fund is funded through taxes assessed on producers

of solid and hazardous wastes and from facilities that release hazardous materials to the environment, as well as from fines collected through enforcement of environmental regulations.

Local governments that respond to releases or threatened releases of hazardous substances, including releases caused by clandestine drug labs, may apply for funding from EPA's Local Government Reimbursement Program. The Local Government Reimbursement Program can help communities cope with costs incurred from the cleanup of clandestine labs. Those costs may include overtime pay for employees, renting or leasing equipment, and special technical services and laboratory costs. Applications may be obtained by visiting: www.epa.gov/superfund/programs/er/lgr or by calling 800-431-9209.

Additional Considerations

States that have or are planning to develop a clandestine drug lab response program need to consider the timing of the removal action, the amount or volume of hazardous wastes, the types of hazardous wastes, and what media (e.g., soil, groundwater, surface water, air) is or could be affected by the hazardous wastes. Also, how are the contaminated solid wastes like the carpeting, wallboards, drapes, furniture, and clothing going to be handled? Finally, who will decide and how will the determination be made whether a home is safe for re-use? These are important decisions and necessary steps, as there are documented cases where innocent tenants or their children have suffered acid burns from the carpeting after reoccupying a home that formerly housed a clandestine drug lab.

Dangers also exist for the emergency removal personnel to consider. First responders need to be aware of booby traps of various types, including explosives, firearms, dogs, and other types of site security.

States have dealt with these situations differently. Some States use the DEA contractor exclusively, some States have programs that perform the emergency response actions, some States use their local fire departments to respond to clandestine lab sites, and some use a combination of all the above.

Kansas Meth Watch Program

To help retailers in Kansas, the Kansas Bureau of Investigation and KDHE created the Meth Watch Program. The Meth Watch Program was created to educate retailers about the precursor chemicals associated with methamphetamine production and how they are used at clandestine labs. Corporate members of the Meth Watch Program include a broad range of retailers around the State.



Trademarked Meth Watch

The Meth Watch Program provides local retailers with training and common sense ways to deter the theft of precursor chemicals, especially items containing ephedrine or pseudo-ephedrine. The training includes a videotape for retail employees, to aid in understanding the methamphetamine problem and how chemicals in their store are abused to make methamphetamine. Suggestions to deter theft of these products include: limiting the number of product boxes containing ephedrine or pseudo-ephedrine on the shelf; moving the boxes containing these products behind a counter so persons requesting the material will have to ask for it; and/or installing a video camera on the aisle to watch for persons that may steal this merchandise. The Meth Watch Program also encourages retailers to work with their local law enforcement agency. Retailers are asked to contact local law enforcement when they notice someone making a suspicious transaction.

Kansas has had a 41% reduction in labs as a result of moving precursor drugs behind the counter.

The Meth Watch logo is trademarked by KDHE to increase the recognition across political boundaries in the United States and Canada. The trademark and program materials are free for use in non-profit education efforts by organizations and governments worldwide. To learn more about the Meth Watch Program, visit their website at: www.kdheks.gov/methlabs or www.kansasmethwatch.com.

III. REMOVAL CASE STUDIES AT CLANDESTINE LAB SITES

Meade Valley Super Lab, California

The California Department of Toxic Substances Control (DTSC) conducts removal actions at clandestine drug labs throughout California using 6 removal/remediation zone contractors. In 2003, in conjunction with local law enforcement authorities, DTSC conducted a removal action at a methamphetamine super lab in a remote area of Meade Valley in Riverside County, California. In response to notification from the Riverside County Sheriff's Department of a large active methamphetamine lab, DTSC mobilized its contractor. Based on the inventory provided by the Sheriff's Department, an initial estimate and approval for the work was given at \$30,000 to \$40,000, a higher than typical cost.

The lab was located on a large acreage property in a remote area. Methamphetamine manufacturing activities were conducted in a barn and shed on the property using the Red Phosphorus method. The lab had operated for approximately 10 years.



Meade Valley Super Lab: Front of Shed

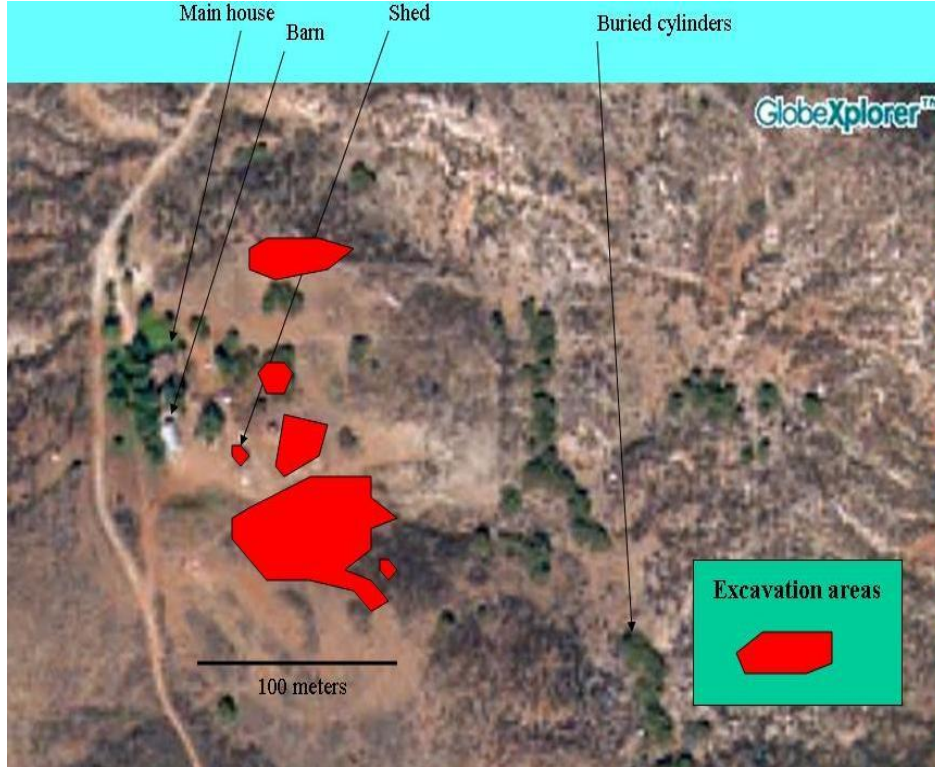
A survey of the property indicated that the house on the property was apparently not used or contaminated, but there were numerous locations where waste may be buried on the property. Excavations found numerous and extensive areas where lab waste was disposed including cylinders. Soil with a pH of 14 adjacent to the shed identified the location used for disposal of caustic solutions used in the operation. Accordingly, the shed was demolished and the waste and contaminated soil below it was excavated. At the numerous disposal locations, remaining soil was determined to be clean by visual observation and measurement of pH, where appropriate.

Twenty-five cylinders (hydrogen chloride gas generators and propane tanks) were found buried and in the buildings on the property and were evaluated, purged, neutralized, and disposed as hazardous waste. Some corroded cylinders were opened by the Sheriff's bomb squad using shape charges. Bulk chemicals were sent to Crosby and Overton, Inc. in Long Beach, California, which is a permitted storage facility that classifies and consolidates similar hazardous wastes and transfers them for treatment (if appropriate) and disposal. Uncontaminated trash was separated and left at the site to be collected with the household garbage. The pH of the septic tank liquid was also tested but found to be neutral and therefore no removal was conducted. Over 1000 tons of contaminated soil, lab wastes, and contaminated debris were removed from the

site and disposed at the Kettleman Hills Class I landfill. The final cost for the removal action was approximately \$340,000.



Knocking Over Shed to Get to Waste Below



Meade Valley Super Lab: Excavation Areas

Silverton Methamphetamine Lab, Oregon

The Oregon Department of Human Services, Health Division Drug Lab Cleanup Program, conducted a removal action at a methamphetamine lab in Silverton, Oregon. In Oregon, the Department of Human Services is responsible for certifying the cleanup of clandestine drug labs and for issuing a Certificate of Fitness prior to reoccupation of the property.

While executing a search warrant in September 1999, the Marion County Sheriff discovered the drug lab. The lab covered 2 adjacent properties and consisted of an unfinished residence, camper shell, mobile home, a camper storage shed, another storage shed, a burnt house, a workshop, and a covered parking area. The properties were serviced by a septic tank and 2 private drinking water wells.



Trash Pit Where Wastes from Clandestine Lab Were Dumped

The site had a dump area adjacent to the mobile home that was approximately 20 feet square and 4 feet high. The depth of the dump area was not known. There was also an area where the soil was covered with a white substance, which was later identified as sodium acetate. (Note sodium acetate is used to manufacture phenyl-2-propanone (P2P), a precursor used in the manufacture of methamphetamine by the Amalgam method.) It is estimated that over 150 pounds of methamphetamine was produced at this site, and evidence suggests that the lab used both the Amalgam and Red Phosphorus methods.

Gross removal of chemicals was accomplished in 1999. After legal issues were resolved, under the ownership of the United States Marshall's Office, a site evaluation report was filed in June of 2004. During the development of this assessment there was a slight P2P odor upon entry to the mobile home. The workshop contained multiple bags full of engine starter fluid that had been opened from the bottom and drained (a technique used to remove the ether from the fluid during the manufacture of methamphetamine), empty cans of mineral spirits, a 5-gallon can of kerosene, and 3 large car batteries. White crystal powder was spilled onto the counter tops.

Wipe samples indicated the presence of methamphetamine in a range of 1.3 micrograms per square foot ($1.3 \mu\text{g}/\text{ft}^2$) in the second floor of the house, to $570 \mu\text{g}/\text{ft}^2$ in the west end of the workshop. (Note the cleanup standard for methamphetamine in Oregon is $0.5 \mu\text{g}/\text{ft}^2$.) The shed floor and benches were also tested for lead and mercury. Lead was detected at 13.7 milligrams/kilogram (mg/kg) and mercury was detected at 10.5 mg/kg, although these were below the Oregon residential soil cleanup standards for lead and mercury. There was no sampling of the dump area or wells prior to the removal action.



Inside View of Clandestine Lab

The removal action included demolition and removal of all structures, removal and disposal of all vehicles, excavation of the dump area, removal of the white substance area, and purging of the drinking water wells.

Post removal sampling was conducted in June 2004, and a Certificate of Fitness was issued on May 26, 2006 for both of the properties.

Conclusions

The number of clandestine labs nationwide is growing and labs are being discovered in more geographic regions throughout the country. There is a corresponding need to address the environmental contamination associated with these labs, and in particular the residual contamination that may exist after law enforcement (e.g., DEA) has completed first response and the removal of the bulk or gross contamination. The first response actions conducted by law enforcement agencies are often not sufficient to address all contamination or the issues that arise relative to potential residual contamination. As a rule, the public, communities and owners have turned to State programs to resolve these outstanding issues and concerns. Most States are dealing with the cleanup of clandestine drug labs largely using existing resources, and in some instances have distributed responsibilities between several governmental agencies to minimize the financial and workload impacts born by any one agency.

As the report indicates, there are many agencies involved in responding to the discovery of clandestine drug labs. Of particular importance is the need for State environmental agencies to be notified by law enforcement following the discovery of an illegal drug lab. Notification is critical in order to evaluate and address any potential releases of hazardous materials to the property and surrounding environment. Information regarding the removal of or known existence of contaminated building materials, soil, and other environmental media should be included in the notification.

The research conducted on State response programs reveals that many States are aware of the contamination issues associated with illegal drug labs, although the level of State experience varies greatly from a few sites per year to up to thousands of sites per year. Of 42 States that provided information for this effort, 14 States are reported to have statutes, regulations or guidance that establish formal drug lab response protocol. In addition to having a notification process, States establishing or enhancing their drug lab response programs should pay special attention to the following issues:

1. Decontamination protocols that outline how buildings that housed former drug labs should be cleaned;
2. Procedures that restrict reoccupation of properties following discovery of the drug lab, and provide criteria on how to evaluate whether a home that has been contaminated by a clandestine drug lab is safe for reoccupation;
3. Cleanup criteria for methamphetamine and other chemicals commonly associated with abandoned drug labs, recognizing that there is still uncertainty regarding these standards;

4. Sampling techniques to determine what contaminants may be present. Currently there are no standardized techniques for collecting and analyzing interior wipe samples;
5. Database to track known clandestine drug lab sites, the status of their cleanup and if they have been reoccupied; and
6. Establishing a definition of roles and responsibilities with other agencies to ensure good communication and cooperation on how these sites will be managed, including an evaluation of resources needed to carry out their respective duties.

Attachment A contains a summary of information on key components of State programs. The summary may be a valuable tool to determine what other States are doing on issues such as establishing cleanup criteria or if cleanup contractors are being licensed or certified to conduct the decontamination of buildings as means to complement State resources. Additionally, Attachment B contains an extensive list of resources and websites that are available sources of information. This information can assist States in development of drug lab cleanup programs. Furthermore, through the sharing of State experiences, the information can assist States with existing programs in their efforts to make these programs more effective and to efficiently utilize existing resources.

Attachments

The following documents were produced or provided by the Removal Action Focus Group as part of the Group's research on clandestine drug lab remediation. To view the documents, click on one of the links below, or visit the ASTSWMO web site at: www.astswmo.org and click on "publications" and then on "CERCLA and Brownfields Research Center".

- A. [State Program Response Information](#)
- B. [References and Additional Resources](#)
- C. [EPIC Form](#)
- D. [EPIC Instructions](#)
- E. [Examples of Placards](#)