



Meth Lab Cleanup Instructor Guide

January 2007

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Midwest Consortium for Hazardous Waste Worker Training

Acknowledgments

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The material was prepared for use by experienced instructors in the training of persons who are or who anticipate being employed at a meth lab cleanup worksite. Authors of this material have prepared it for the training of this category of workers as of the date specified on the title page. Users are cautioned that the subject is constantly evolving. Therefore, the material may require additions, deletions, or modifications to incorporate the effects of that evolution occurring after the date of this material preparation.

Disclaimer

There is currently no Occupational Safety and Health Administration (OSHA) regulation specifically regarding the clean up of methamphetamine (meth) labs. Since a meth lab can often be considered a hazardous waste site due to the toxic mix of chemicals that go into production, we will regularly refer to OSHA's hazardous waste site regulations. This regulation, 29 CFR 1910.120, requires training material to cover basic hazard recognition, use of provided personal protective equipment, basic hazard control, decontamination procedures, and other relevant standard operating procedures.

At the time these materials were prepared, Colorado had the most comprehensive state regulations for meth lab clean up procedures. This introductory program is therefore based largely off the Colorado laws and standards, with references also to Washington and Tennessee state standards.

Additional training is necessary to perform many activities. These activities include implementing the emergency response plan, identifying materials using monitoring instruments, selecting protective equipment, and performing advanced control containment or confinement. Additional site-specific training for emergency response must be provided so that you understand how to recognize and respond to alarms at the site and can carry out any role which may be assigned during a response.

For information about further training, consult the training instructor, your company safety and health plan, or your company health and safety representative.

Introduction

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Introduction

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The Center to Protect Workers' Rights

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United Auto Workers

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Introduction

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Introduction

Preface

Trainees are here because they are or will be employed as meth lab remediation workers. During this program they will learn about the following topics:

- Site safety and health plan.
- Health and safety hazards.
- Use of personal protective equipment.
- Work practices and other controls to minimize hazards.
- Medical surveillance.
- Monitoring.
- Other resources.
- Drum and container handling.
- Emergency response.

When they finish, they will be better able to do the following:

- Recognize a meth lab.
- Recognize hazards within that lab.
- Use protective equipment.
- Perform necessary sampling and decontamination.

Introduction

Proposed Agenda for Meth Lab Remediation

This agenda is flexible and may be adjusted by the instructor to the needs of the class.

Day One:

Rights and Responsibilities

Hazard Recognition

Hazard Control

Work Practices

Day Two:

Personal Protective Equipment

Monitoring

Decontamination

Emergency Response

Day Three:

Simulation

Discussion and Critique of Simulation Exercise

Introduction

Instructor Preparation

The course incorporates a variety of teaching methods to meet varied learning styles. Discussion within small-group activities/exercises is used to present material. The Instructor Guide provides step-by-step instructions for presenting the material. Each chapter of the Instructor Guide includes information such as time requirements, teaching methods, required materials, suggested instructor preparation, minimum content requirements, issues which may arise, and reference materials. Every instructor should be familiar with the material in the entire Student Manual, the Instructor Guide, and the content he/she is teaching. In addition, the instructors should be familiar with the OSHA Standard 29 CFR 1910.120, and local meth lab cleanup rules and procedures. It is expected that participants will have completed the 40 hour site worker program.

Carefully review the section(s) of the Instructor's Guide which correspond to the topics you are teaching.

An emergency response plan must be in place for this program (see Appendix A) and known to all instructors.

Graphics/Audiovisuals

Graphics are available and should be referenced to assist with in-class instruction. Throughout the Student Manual are illustrations of chemical properties, measuring instruments, respiratory protective equipment, and protective clothing. Refer trainees to these illustrations. Powerpoint slides should be limited to those which support lesson presentation. Avoid using one-word slides, slides with term definitions, and slides as lecture outlines. These types of presentations are not effective at keeping trainee attention. Effective slides refer directly to the scenario or answers developed by the small groups.

Qualifications for Trainers in Meth Lab Simulation

4 or more instructors on the Meth Lab Simulation (1 lead; 3 or more assistants).

All personnel are medically certified for respiratory protection and unrestricted physical activity. At least one instructor certified in First Aid and CPR (if EMS on site this requirement can be waived). Specialized training in heat stress related illnesses is recommended. (NOTE: A slide program is available from the ACGIH.)

The lead trainer must have successfully completed formal, documented training or otherwise possess the skills, ability, and knowledge gained through actual experience to recognize the use of and to anticipate the problems in the use of Levels C and D personal protective equipment.

Personal work experience in the use of Levels C and D protection is recommended. The lead trainer should have prior experience in training personnel in the use and decontamination of Levels C and D personal protective equipment. All trainers must have a working knowledge of the Emergency Response Plan.

PRESENTATION OF MATERIAL

This program is developed to be presented completely as exercises and labs. There are no lectures; rather the material that accompanies the exercise is provided as a reference. The instructor's role is to facilitate and assure that questions are answered. The Lesson Plan Format may be useful as a checklist for the instructor to assure that key points are covered during the exercise and discussion.

Each day should begin and end with at least 10 minutes of review. Reinforce key points and objectives. As manual chapters are covered, you may want to refer trainees to the "Key Terms" and "Review Questions" pages. Outlines in this guide for each chapter highlight main topics in the Student Manual. These outlines show the minimum content to be covered.

Small-Group Activities and Exercises

Small-group activities and exercises are the basis of this training course. Exercises are outlined in the Student Manual as well as in the Instructor's Guide. Activities are outlined in the Instructor's Guide only with instructions for presentation. The purpose of these activities and exercises is to experimentally involve trainees in clarifying information, identifying options, and applying skills. Be sure to allow sufficient time for trainees to complete activities.

Begin the course by splitting up the trainees into groups of two to four people. For an ice-breaker, have the trainees introduce themselves within their group. When they introduce themselves, have them relate a situation that involved an emergency response. How do they think it could have been done more safely? Assume that every class will have participants with a wide range of communication skills. Some trainees will have no problem participating in group discussion, while others may have difficulty speaking before the group.

Course Overview

Class activities and exercises enhance the learning process; therefore, it is strongly recommended that you make the atmosphere of the course activities and discussions comfortable so that all can participate. To make the course comfortable:

- Allow trainees to express their values, attitudes, and opinions freely.
- Do not judge trainees' responses.
- Facilitate discussion by paraphrasing and clarifying. It is seldom appropriate for the instructor to give opinions.
- Avoid putting people on the spot. Instead of asking individuals for answers, have a voluntary group spokesperson present answers to the class.
- Keep the groups focused on the task at hand. Because small-group activities and exercises will draw heavily on trainees' personal experience, sometimes one person can dominate the group. If this happens, steer the discussion back on track by asking another group for reactions.
- Keep the trainees alert and interested by encouraging participation. If the groups are not participating or if they are giving only cursory answers, ask the groups probing questions about their answers to make them be more specific.

Labs and Simulation

Labs and the simulation are designed to give trainees hands-on experience using equipment while reinforcing theoretical aspects learned in exercises in class. Most labs are set up as four rotating stations with an assistant instructor at each station. Performance checklists are completed by the trainee during the lab exercises. At the end of each station exercise and before a rotation is made, performance checklists must be signed by the instructor, collected, and retained by the training center as part of the trainee's permanent records.

Introduction

Refer to Participant Guide, Introduction Pages and Table of Contents.

- Have several 40-Hour Site Worker Manuals out as a reference and for trainees to review.
- Give overview of Acknowledgements, Warning, and Disclaimer.
- Go over Preface with students. Make sure they understand the overall objectives of the course.
- Have everyone introduce themselves and describe experience as you can better tailor the program. Some sections may be review for participants. Remember, know your audience.
- Pass out a copy of the agenda (next page). There is no copy of the agenda in the Participant's Manual. The Instructor's Manual is set up to reflect this agenda. This agenda can be adjusted by the instructor, if needed.
- Go over the Table of Contents so students have a general idea of what they will be learning in the next few days.
- Chat with the trainees. Ask them questions about their training and work history.
 - How long ago did you take the 40-Hour Site Worker? 8-Hour Site Worker Refresher?
 - Did you take these, or any other courses with the Midwest Consortium?
 - Where are you working now?
 - Have you done any hazardous waste site work or work on meth labs in the past?

INTRODUCTION

- The 40-Hour Site Worker class is prerequisite to this course. Also, trainees must turn in a doctor's note giving them permission to wear PPE and respirators.
- Invite trainees to look over the 40-Hour Site Worker manuals.

Agenda for the program

Agenda 1

Day 1 8 a.m.	Introductions
8:30 a.m.	Meth lab over view, mock lab
9:30 a.m.	Hazard Recognition (based on mock lab)
10:30 a.m.	Break
10:45 a.m.	Hazard Control (based on mock lab)
noon	lunch
12:30 p.m.	Work Practices for Hazard Control, including labs and a break
4:30 p.m.	Review
Day 2 8 a.m.	Critique work practices; what others are needed?
9 a.m.	PPE needs
9:30 a.m.	Monitoring—with and lab (as appropriate for needs of participants-wipe sampling, PID)
10:30 a.m.	Break
10:45 a.m.	Monitoring continued
11:30 a.m.	Rights and Responsibilities
12:30 p.m.	Lunch
1 p.m.	Emergency Response
2 p.m.	Decon
3 p.m.	NIOSH Pocket Guide/MSDS
4:30 p.m.	Review
Day 3 8 a.m.	Overview of simulation and simulation
Noon	lunch
12:30 p.m.	Critique of simulation and review
4:30 p.m.	Evaluation
5:00 p.m.	Adjourn

Rights and Responsibilities

Refer to Participant Guide, pages 19-42.

This section covers the basic rights and responsibilities that employers and employees have which help to ensure safe working conditions. The focus is on laws and regulations regarding meth lab cleanup and best practices that can be taken from OSHA's HAZWOPER and HAZCOM regulations.

Minimum Content Requirements

The following are minimum content requirements for the Rights and Responsibilities chapter:

- Current status of meth lab-related laws
- Scenario
- Brief review of HAZWOPER and HAZCOM
- OSHA worker rights and responsibilities
- OSHA employer responsibilities

Teaching Methods

- Lecture/discussion
- Small group activity

Reference Materials

- Washington Administrative Code, Chapter 246-205: Decontamination of illegal drug manufacturing or storage sites.

RIGHTS AND RESPONSIBILITIES

- Tennessee Department of Environment and Conservation Reasonable, Appropriate, Protective Cleanup Response and Documentation Guidance for Properties Quarantined due to Clandestine Methamphetamine Laboratory Activities.
- Procedures for the Assessment and Remediation of Clandestine Methamphetamine Laboratories, Solano County, Department of Resource Management, Environmental Health Services Division.
- OSHAct, specifically Sections 5,6,9,10,11, and 18.
- Preamble to 1910.120.
- OSHA Standards 1910.120, .38, .134, .156, .1000, and .1200.
- OSHA regulations on penalties, citations and inspections (29 CFR 1903 and 1904).
- OSHA has several good brochures on OSHA Rights. These may serve both as good review and as extra handouts. EPA also has some publications on SARA available. Contact EPA for a list of publications if you haven't already done so.
- For very technical enforcement questions, refer to the Field Operations manual.

Questions You May Be Asked

Many trainees will question why other rights or responsibilities are not in the law. Trainers should be prepared to facilitate this discussion.

It is likely that employees may state that employers are not meeting their responsibilities. Trainers need to know in advance the mechanism for health and safety problem resolution if trainees are in a contract program. If open enrollment, the trainer should be prepared to facilitate a discussion of how to approach problem resolution.

Audio Visuals

- Projector
- Flipchart

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section

- Unlike regulations for the 40-Hour Site Worker course (e.g. 29 CFR 1910.120), laws pertaining to meth labs are in a constant and slow process of being written, revised, and passed. Do research of your own on state, federal and local laws. The Midwest Consortium's monthly Trainer News will help keep you up to date.
- Prepare overhead with answers to Scenario and review questions.

Scenario

Read the Scenario on page 23 of the Participant Guide and have participants answer the questions. Discuss answers with participants in small groups. Answers:

1. Yes, this scenario, or something like it could happen.
2. Carol has the right to be trained first in the proper use of her PPE and safe work practices to keep her healthy. Her 40-hour program is more than a year old. Did she have the required refresher?
3. Ted has the right to try to stay on the work schedule, but he does not have the right to force Carol into a potentially unhealthy and unsafe situation without proper training.
4. Carol has the right not to go out to the work site until she's been trained. That could be dangerous not only for her, but for the other workers around her. She may have difficulty in getting OSHA to support her, if in a state without a law for meth labs, and even then it will take time.
5. Ted has the responsibility to provide the training that Carol needs. He is not allowed to put off training until after the work is initiated in Tennessee or Minnesota.
6. Carol should explain that she really needs this training to keep herself and her new co-workers safe and healthy. If Ted refuses to provide this training for her, Carol should leave the area and fill out an OSHA Complaint Form to report his behavior. Unless there is a worker representative to support her, she may be terminated.

Ideas for Discussion/Activities

- OSHA Complaint Form
 - Ask if students have ever used this form. Why?
 - Can students come up with any reasons why they might need to use this form?

RIGHTS AND RESPONSIBILITIES

- Worker Rights
 - Ask participants what they think should be included in rights under the OSHAct. Make a list on a flipchart and compare with the items below:
 - Right to have an inspection of the workplace.
 - Right to participate in the OSHA walk-around inspection.
 - Right to be a witness or to give information.
 - Right to be informed of imminent dangers.
 - Right to be told about citations.
 - Right to appeal about OSHA performances.
 - Right to appeal abatement dates (when a violation must be fixed).
 - Right to have a closing conference after an inspection.
 - Right to know of health hazard exposures.
 - Right to have access to OSHA records.
 - Right to participate in development of new standards.
 - Right to review a citation procedure when a citation is not issued.
 - Right to file a discrimination complaint.

Review Questions

Have students complete the review questions section on page 42 in the Participant Guide.
Answers:

1. T
2. F
3. F
4. F
5. T
6. F
7. Safety and Health Plan, Medical Surveillance Program, Decontamination Program, New Technology Program, Material Handling Program, Training Program, Emergency Response Plan

RIGHTS AND RESPONSIBILITIES

Meth Lab Basics

Refer to Participant Guide, pages 43-50.

This section covers basic information pertaining to meth labs, manufacture of meth, and typical lab locations. The focus of this section is to introduce the dangerous nature of meth labs and methamphetamine. If you chose to follow the first course outline, the entire morning is built around a mock up meth lab that is constructed in the corner of the classroom. This stark visual should be an important aid to stimulate discussion and ensure students begin to understand the issues raised in the morning sessions.

Minimum Content Requirements

The following are minimum content requirements for the Meth Lab Basics chapter:

- Methods of meth manufacture
- Typical meth lab locations
- Why it's necessary to decontaminate a meth lab

Teaching Methods

- Lecture/discussion

Audio Visuals

- Meth Lab mock-up Table
- Flipchart, markers

Special Space Requirements

- Area for mock-up meth lab

Meth Lab Mock-Up Table

It is an effective training tool to set up a mock meth lab for trainees to examine. There is no sense in being too accurate, as we do not want to teach trainees how to manufacture methamphetamine, but a basic setup will help prepare trainees for what they will encounter during an actual meth lab cleanup and is a visual to stimulate discussion. The basic idea is messy. From discussions about lab equipment and chemicals during the training session, trainees may get a more organized impression of a meth lab than is actually the case. Meth cooks leave all sorts of hazardous waste, household items, and empty bottles in a jumble on their work surface. Trainees need to be prepared to deal with a disaster area.

***REMEMBER:* All props should be empty containers, no actual chemicals should be in the area.**

Supplies Needed for Meth Lab Mock-Up Table

Equipment: Work tables or benches

Reaction vessel (2000 ml)

Slant joint for normal distillation

400 mm Allihn condenser (any water cooled condenser which can be used for refluxing)

1000 ml graduated beaker (Pyrex measuring cup)

1000 ml Pyrex baking dish

Portable electric griddle

Mortar and pestle

Coffee filters

Blender

Mason jars

Spoons, spatulas

Funnels

Test tubes and test tube racks

Mini propane tanks (as used for camp stoves)

Large propane tanks (as used for full-size gas grills)

Note: One interesting thing might be to color the valve on the larger proportion tank blue. This is the color they become when the meth cook uses the tanks to transport Anhydrous Ammonia.

Plastic tubing

Rags

Garden hoses

Buckets

Misc. bowls, pots, and pans

pH up/down kit

Ingredients: Heet

Cold pills containing pseudoephedrine (Sudafed)

Matchbooks

Nail polish remover

Paint thinner

Kitty litter

Red Devil Lye

Iodine solution

Toluene

Iodized salt

Starter fluid

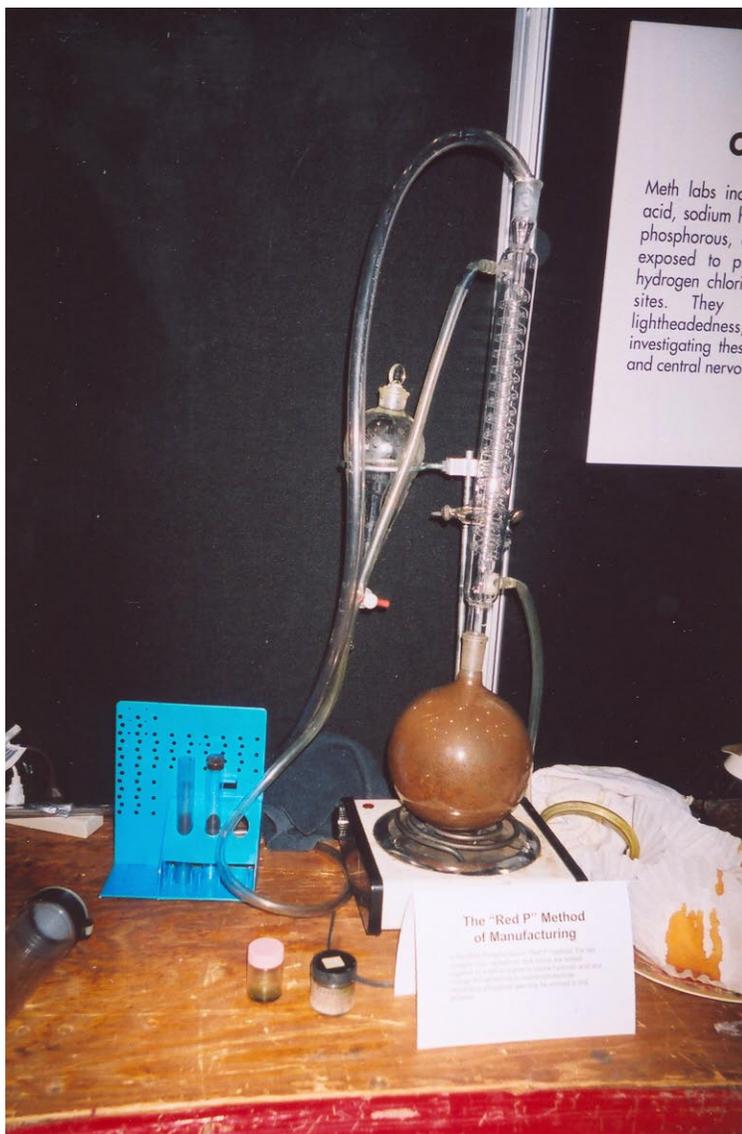
Epsom

METH LAB BASICS

Misc. Items: Half-crushed beer cans
Crumpled paper balls
Stained coffee filters
Hypodermic needles
Plastic spiders and snakes
Lines of “meth” powder (baking soda)
Children’s toys

Sample Photos

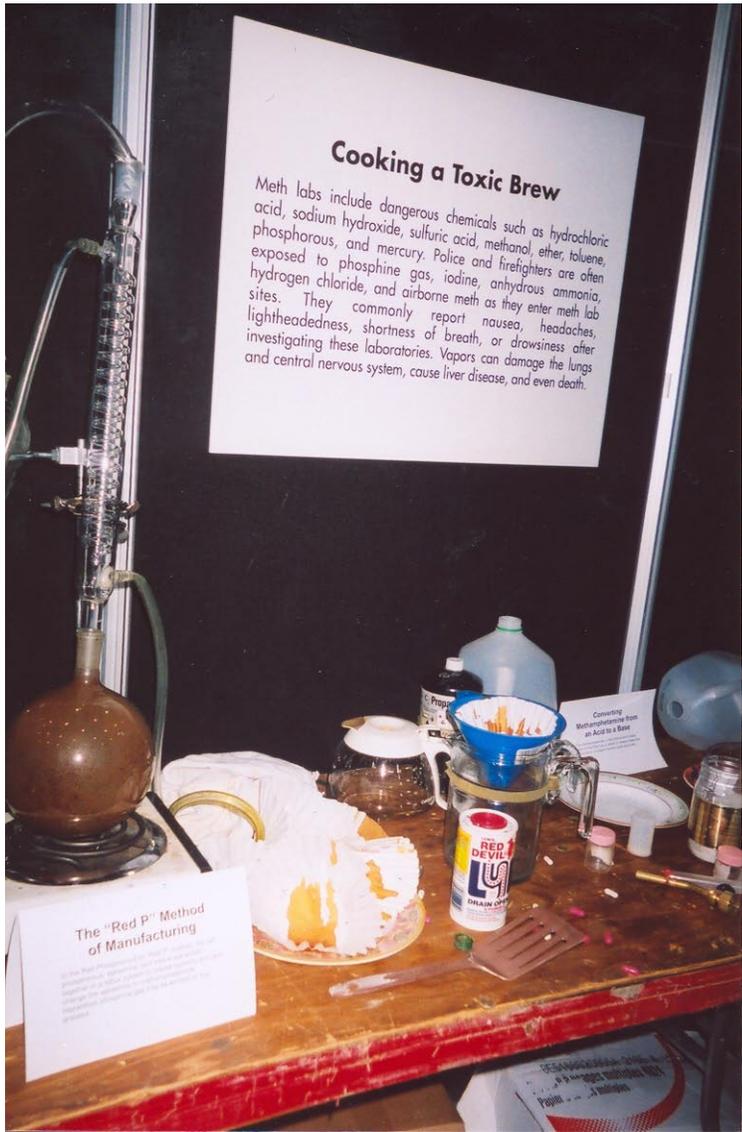
The following photos are available on the program CD. They were taken at a simulated meth lab at AIHCE 2006.





METH LAB BASICS





METH LAB BASICS





Set up a meth lab mock-up table using the photos as a guide.

The list of “Misc. Items” contains items useful to demonstrate the clutter of a meth lab and the hazards of a meth lab. Trash like balled-up paper and empty beer cans litter meth labs, making them hard to navigate. Hypodermic needles present an obvious risk. Plastic snakes and spiders serve as a reminder that meth cooks will go to any length to booby trap the lab, including the release of poisonous creatures. Children’s toys can also present a hazard. Stuffed animals can harbor large amounts of contamination and should be properly disposed off. Other toys could present slip, trip, or fall hazards.

Ideas for Discussion/Activities

- Mock-up lab
 - As students come into the classroom and wait for the class to begin they have probably wandered up to the Meth Lab mock-up table and examined it. This may have generated discussion among the students before the class begins. At the beginning of this section you should invite the class up to examine the mock-up. You can then ask them what they saw and why it was included in the mock-up. Record their observations on a flip chart. You should use their observations and comments to first begin to understand the knowledge of class participants regarding meth labs, meth production, and the dangers of meth; second, use their observations to guide your discussion of the Minimum Content Requirements.
 - Ask trainees to share what they're heard of meth labs.
 - Do a little research. Have any labs been found in your area recently? Print out news articles from local papers to share with trainees.
- "Faces of Meth"
 - On page 44 of the Participant Guide are before and after photos of a meth addict, two years apart. For more before and after photos, go to www.facesofmeth.us. You can download free photos from this site, run by the Multnomah County Sheriff's Office in Oregon, which you could use as a handout or PowerPoint visual aide.
- Statistics
 - Print out the 2003 "Seizures by State" document (see Reference Materials section for web address) and show to trainees. Discuss.

Questions You May Be Asked

After discovering how dangerous methamphetamine and meth labs are, trainees may ask why the government isn't doing more to protect citizens and cleanup contractors. Be prepared to facilitate this discussion. Suggest trainees write to their senator or congressman if they feel strongly about this.

Review Questions

Have students complete the review questions section on page 49 in the Participant Guide.

Answers:

1. The answer to this question varies depending upon the area. For instance in Minnesota, a heavy farming area, the most likely method is the Nazi method because Anhydrous Ammonia is used by farmers for fertilizer and thus easy to acquire. In other areas, other forms may be more prevalent. Needless to say that new technology is always creating new methods to get around law enforcement attempts to curtail production.

Note: Instructors must identify correct response for the state/region.

2. See table on pg. 45 in Participant Guide
3. Meth labs are commonly located in extended-stay motels, homes, sheds, and mobile homes or other vehicles.
4. See table on pg. 47 in Participant Guide

Reference Materials

- Campo-Flores, Arian. “The Fallout: I Felt My Face Just Melting”. Newsweek. 8 August 2005. <http://msnbc.msn.com/id/8769919/site/newsweek/>
- Goddard, Terry. “Arizona Drug Endangered Children Program (DEC): Annual Report”. 31 October 2003. <http://www.azag.gov/DEC/AnnualReport2003.pdf>
- Missouri State Highway Patrol. “2004 Nationwide Methamphetamine Laboratory Incidents.” <http://www.mshp.dps.missouri.gov/MSHPWeb/Publications/Reports/2004NationwideLabIncidents.pdf>
- “Seizures by State 01/01/2003 - 12/31/2003: Report Generated By EPIC’s National Clandestine Laboratory Seizure System.” <http://www.drugfreeinfo.org/PDFs/States seizures.pdf>
- Montana Department of Justice. “Meth in Montana.” <http://www.doj.state.mt.us/enforcement/methinmontana.asp>
- Website of U.S. Senator Dianne Feinstein. “Senators Feinstein, Hutchinson, Kohl Introduce Bill to Provide 125.5 Million to fight Methamphetamine.” 19 July 2002. <http://www.senate.gov/~feinstein/Releases02/meth.htm>

Hazard Recognition

Refer to Participant Guide, pages 51-132.

This chapter reviews routine hazards that may exist in meth labs. Methods to recognize hazards are discussed. Material Safety Data Sheets are discussed and used in an exercise. Remember that much of this material is a review of participants. Know your audience. That is why we suggest using small group exercise for this chapter and allow the participants to pick up the information for themselves.

Minimum Content Requirements

The following are minimum content requirements for the introductory materials for this chapter:

- Potential hazards to meth lab cleanup workers
- Meth lab recognition

The following are minimum content requirements for Chemistry:

- Chemical and physical properties
- Fire triangle
- Explosive limits
- Incompatible chemicals
- NIOSH Pocket Guide

HAZARD RECOGNITION

The following are minimum content requirements for Toxicology and Health Effects:

- Basic principles of toxicology
- Dose response
- Cancer caused by chemical or physical agents
- Exposure limits

The following are minimum content requirements for Physical and Safety Hazards:

- Types of Hazards

Teaching Methods

- Small group activity
- Discussion

Audio Visuals

- Flipcharts, markers
- Blue painter's tape to attach pages to wall

Special Space Requirements

- Area and table for meth lab mock-up

Reference Materials

- NIOSH Pocket Guide
- Relevant MSDS
- OSHA Construction Standard

Using the Meth Lab Mock-up to generate student ideas, break the class into small groups and have each group report the potential hazards found in the mock-up. As the group reports its listed hazards back to the class lists all of the hazards on a flip chart. Different groups may repeat the same hazard and that is ok. { Keep each groups contributions on seperate flip chart sheets}. [Save flip charts for Hazards Control exercise]. Try to keep this to about 15-20 minutes for the entire exercise. Now assign each small group a hazard to investigate in the student manual and to report back on to the entire class. To make sure that all of the hazards are adequately covered, assign each group a different hazard to investigate and report on. (Make sure that all of the minimum contents requirements are included in the small group activities, if for some reason they are not be prepared to discuss any not covered with the class).

One group might list propane tanks as an explosive hazard. Assign that group fire and explosive hazards to investigate and report back to the class. Another group might also pick the propane tanks. As the instructor, you might probe deeper to see if they saw the potential of another hazard with the tank. If they noticed the blueing of the valve (possibly with your prompting) you could assign them chemical hazards, since anhydrous ammonia is often stored in these tanks. Still another group might list all of the chemicals spread around the lab. Assign this group incompatible chemicals. Another group might pick the general mess of the lab; assign them physical hazards. If a group sites the chemicals in the lab, assign them chemical hazards.

As the groups are working make sure they look at the health effects of the chemicals. Make sure the groups utilize all of their resources such as the student manual, MSDSs and the NIOSH Pocket Guide. This section should take at least 30-35 minutes and then have the groups report their findings back to the class.

When the groups report back, list all the hazards on flip charts. Using the ideas generated by the class, enter into a discussion of the topics in this chapter to ensure that the topics listed in the minimum content are covered. Be prepared to enter the discussion to keep it on track and to add additional information if needed. Try to get each group to do as complete a report as possible.

HAZARD RECOGNITION

Review Questions - Chemistry

Have students complete the review questions section on page 80 in the Participant Guide. Answers:

1. Heat/fire/explosion, toxic gas release, change in pH, change in state of matter.
2. See chemical properties discussed on pg. 58-66 in the Participant Guide.
3. Heat, fuel, oxygen.
4. Heat, fire, explosion, or release of toxic gas.
5. Evacuate the area.

Instructions for NIOSH Pocket Guide Exercise

Divide participants into small groups. Pass out NIOSH Pocket Guides. Assign each group a chemical from the list on page 53 in the Participant Guide. Have participants fill out the worksheet on page 96 of the Participant Guide.

Review Questions - Toxicology and Health Effects

Have students complete the review questions section on page 101 in the Participant Guide. Answers:

1. Eyes: redness, irritation, watery or grainy feeling, damage to vision. Skin: redness, dryness, itching, a chemical burn.
2. Bone marrow, liver, brain, nerves.
3. "Dose response" is the relationship between the concentration (the dose) and the body's response.
4. Ingestion, inhalation, injection, skin absorption.
5. Local effects occur at the point of contact. Systemic effects occur away from the point of contact.

6. Scrotum & scalp/forehead.
7. Acute exposures are exposures to high concentrations of chemicals over a short duration. Chronic exposures are exposures to low concentrations of chemicals over a long period of time.

Review Questions - Physical and Safety Hazards

Have students complete the review questions section on page 112 in the Participant Guide.
Answers:

1. Exposures to the vapors of solvents, explosion, or fire. Workers should be alert to containers that may contain volatile organics, their condition and position relative to spark sources, and other hazardous materials and to any airborne evidence (smell or sight) that organics are escaping from a container.
2. Wear chemical-protective clothing, gloves, and goggles, move materials carefully to prevent contact.
3. Meth labs often have propane tanks on the premises, so they could constitute a fire hazard. Also, booby traps, hot plates, and chemical interactions could lead to a fire.
4. See pg. 107 in Participant Guide.

Review Questions - Materials Identification

Have students complete the review questions section on page 131 in the Participant Guide.
Answer:

1. Material identification, hazardous ingredients, physical and chemical characteristics, fire and explosion hazard data, health hazard data, reactivity data, precautions for safe handling and use, control measures, special precautions.

HAZARD RECOGNITION

Hazard Control

Refer to Participant Guide pages 133-158.

This chapter discusses types of hazard controls useful in keeping workers healthy. Work plans, SOPs, and medical surveillance programs are some of the topics trainees will be discussing.

Minimum Content Requirements

The following are minimum content requirements for the Hazard Control chapter:

- Types of hazard control
- Safety and health programs
- Standard Operating Procedures (SOPs)
- Medical surveillance programs

Teaching Methods

- Small group activity
- Lecture/discussion

Reference Materials

- None

Audio Visuals

- Flipchart, markers for each group
- blue painters tape

Special Space Requirements

- Space for several small groups to work in the classroom or in other areas

Return to each small group the flip chart pages they generated with the hazards at a meth lab. Give each group clean pages and magic marker to list in one column their hazard and then list the control method for the hazard in the other column. Each group needs to use the Hazard control chapter in their participants guide as a reference for this exercise. It is important as the instructor that you move from small group to small group to keep the groups on task and answer any questions that may come up. After 20-25 minutes bring the groups back together and have each group report back to the class and have their chart pages taped to the wall with blue painter tape.

Review Questions

Have students complete the review questions on page 156 in the Participant Guide.

Answers:

1. You can control exposure through administrative and engineering controls as well as through the use of PPE.
2. See what participants know about working at meth lab sites.
3. Topics included in safety and health program are on pg. 138 in Participant Guide.
4. Site characterization includes documenting everything about the meth lab site, from a preliminary evaluation to constant monitoring throughout the process.

Monitoring

Refer to Participant Guide pages 197-230.

This section covers basic monitoring techniques and includes a hands-on lab for participants to practice some techniques found at a meth lab cleanup site. The need for additional instruction using equipment which is available at the trainees' workplace should be underscored.

Minimum Content Requirements

The following are minimum content requirements for Monitoring:

- Explosive limits
- Sampling at meth labs
- Wipe Samples Exercise
- pH sample exercises
- PID sample exercise

Teaching Methods

- Lecture/Discussion
- Hands-on Activity

Reference Materials

- Manufacturer's directions for use, maintenance, and storage of equipment used
- Preamble in TLV booklet
- OSHA Standard: 1910.1000 (revised 9/89) and 1910.20

MONITORING

Questions You May Be Asked

- Trainees may question whether adequate monitoring is done on a routine and emergency basis. For contract programs, reconnaissance will provide the trainer with information about the facility's monitoring program and equipment.
- The access to monitoring information may be a new concept for many individuals. How to request this information and what to do with it (keep with personal medical records, provide it to private or union occupational medical doctor) should be discussed.

Audio Visuals

- Flipchart
- Monitoring equipment (note: for contract programs, employer equipment may be used if the trainer is well versed in its proper operation)

Special Space Requirements

- Space for hands-on-activity

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Review manufacturer's information on operation of monitoring equipment

Instructions for Wipe Samples Exercise

Supplies:

2 pieces each of linoleum, plywood, and carpet, at least 12" by 12"
GloGerm oil and powder (Source: www.glogerm.com)
UV light with extra batteries
Pre-cut wipe squares
Filter paper
Disposal gloves
Copies of worksheet for participants

Set Up:

Take one each of the linoleum, plywood, and carpet and dust them all lightly with GloGerm powder. Take the other set and spread GloGerm oil on each piece.

Divide participants into six groups. Each group will receive one of the six GloGerm covered materials. Give each group a wipe square and filter paper. As you are passing materials out, explain that half the materials have been covered in oil and half in powder, both of which glow under a UV light.

Exercise:

Have participants follow the directions that are in the Participant Guide, pages 214-216. Observe and offer assistance or supplementary directions where needed. Ask participants to leave their gloves on after they are done.

Discussion:

After they have finished taking their samples, bring the class together for discussion.

Shine the UV light on each sample that was taken. There should be six, one from each piece of material. Compare how much contaminant was wiped off of each surface. Which sample showed the most contamination? Which showed the least? Compare both the surfaces and the type of contaminant (oil or powder) in relation to how good a sample was obtained.

Stress that this shows two things. First, it is easiest to clean flat, hard surfaces. Second, it is easiest to get a better wipe sample off a flat, hard surface. Participants need to be aware that if they took a wipe sample off a carpet and it comes back negative, they should try taking a sample another way, like with a vacuum cleaner, to make sure they have accurate results.

First, bring the UV light around to each participant with gloves on. Do the person's gloves glow? Even if their gloves did not directly come into contact with the sampling surface, there could be secondary transfer to their gloves from the filter paper. Shine the UV light on the participants' desks. Do the desks glow? Chairs? Pens? Use this to demonstrate just how easily contamination can spread.

Have participants brainstorm an ideal procedure that would help keep contamination from spreading. Write their procedures up on a flip chart or chalkboard.

MONITORING

Compare their procedures to Washington State's guidelines:

- Before Sampling:
 - Fold filter paper into quarters and insert into sample containers.
 - Wet with methanol (40 drops or 2 ml).
 - Screw lids on tightly.
- Sampling Procedure:
 - Work in teams. Appoint one person to be Sampler and one person to be Record Keeper.
 - Wash and sanitize hands.
 - Both Sampler and Record Keeper put on clean gloves.
 - Record Keeper gets out sample container, and fills out information about where the sample came from, the date, and the time.
 - Record Keeper unscrews the lid on the container, always keeping the lid in his/her hand. (Setting it down could contaminate the sample.)
 - Sampler takes out the wet filter paper, still folded in quarters, and puts paper on area to be sampled.
 - Press firmly, and do not touch sample surface with fingers or thumb.
 - Use a Z pattern, covering the entire area with an even pressure.
 - Fold the sampled side in and repeat wiping technique in the opposite direction (N-pattern).
 - The Record Keeper is responsible for closing the lid tightly.
- After Procedure:
 - When you leave the contaminated area, Record Keeper must place all samples taken into a cooler filled with ice at 40 degrees Celcius.

Make sure participants understand the reason for and benefits of working in a team to take samples at a real meth lab cleanup site.

Complete the Exercise worksheet in the Participant Guide.

Instructions for pH Lab:

With the participants still in their six groups allow them to have a chance to use pH paper. Fill six small beakers with various fluids (e.g. vinegar, bleach, orange juice, household detergent, water, and a combination of the above). Label the beakers A-F and make sure that each group samples each beaker and records their findings on the Lab Sheet. Share and discuss results.

Supplies

- six beakers
- sufficient pH paper or direct reading meter
- various liquids
- flip chart and paper for each group
- copies of worksheets for each participant

Instructions for PID Lab:

Form 3-6 groups. Have already prepared 3-6 sample bags of a gas/vapor for which your PID is calibrated. Label each bag with a number. Have each group rotate, measuring each bag. Share and discuss the results recorded on the lab worksheet. What errors can occur using the PID and the compound you selected?

Supplies

- one or more calibrated PID
- gas sampling bags, with known concentrations
- flip chart and markers
- copies of worksheets for each participant

MONITORING

Wipe Samples Exercise

Washington State has very specific guidelines for how to conduct wipe samples at meth labs, as found in the Guidelines for Environmental Sampling at Illegal Drug Manufacturing Sites. Go through this checklist as you practice taking a wipe sample.

Action	Did You?	
1. Fold filter paper into quarters and insert into sample containers.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Wet with methanol (40 drops or 2 mls).....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Put on clean gloves	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Take out the wet filter paper, still folded in quarters, and put paper on area to be sampled.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Press firmly.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Use a Z pattern, covering the entire area with an even pressure.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Fold the sampled side in and repeat wiping technique in the opposite direction (N-pattern)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. Close the lid tightly	<input type="checkbox"/> Yes	<input type="checkbox"/> No
9. Use a Z pattern, covering the entire area with an even pressure.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Date _____ Instructor's Signature _____

**Monitoring Lab Data Sheet
pH Measurement**

Type of equipment _____

Brand of equipment _____

Purpose of equipment _____

Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____

What are the limitations of this equipment?

Date _____ Instructor's Signature _____

MONITORING

**Monitoring Lab Data Sheet
PID**

Type of equipment _____

Brand of equipment _____

Purpose of equipment _____

Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____
Sample No. _____	Reading (and units) _____

What are the limitations of this equipment?

Date _____ Instructor's Signature _____

Review Questions:

Have students complete the review questions on page 267 in the Participant Guide.

Answers:

1. You could do personal sampling or real-time sampling for vapors (ammonia) or particles.
2. Gas indicator; see Participant Guide.
3. No oxygen, no combustibles, broken.
4. Oxygen-deficient atmospheres do not have enough oxygen in them (less than 19.5% oxygen) such as a confined space area. Oxygen-enriched atmospheres have too much oxygen in them (greater than 23.5% oxygen).

MONITORING

Work Practices

Refer to Participant Guide pages 159-196.

This chapter focuses on the best practices to safely cleanup a meth lab site. While it is important to know and practice the skills needed to perform tasks at a meth lab cleanup site, it is also important to understand and define the concept of Standard Operating Procedures (SOPs).

Minimum Content Requirements

The following are minimum content requirements for the Work Practices chapter:

- SOPs and their importance in meth lab cleanup
- Work Practices Labs

Teaching Methods

- Small group activity
- Hands-on job

Reference Materials

- 1910.120(q) and preamble
- For contract programs, relevant SOPs and the company ERP should be reviewed
- Manufacturers' materials for equipment which will be demonstrated and used in lab

WORK PRACTICES

Questions You May Be Asked

- Trainees may state that particular SOPs are lacking at their work site despite relevant ongoing activities. The instructor must be ready to facilitate discussion of how to determine if an SOP exists, how to obtain a copy within the union/management structure and approaches to problem resolution.

Audio Visuals

- Flipchart, markers, Tape

Special Space Requirements

- Area for multi-station lab
- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare overheads if needed
- Pilot lab at least once before first presentation
- Assemble equipment for labs
- Duplicate lab worksheets

Small Group Activity

If time permits, prior to discussing the steps to take during meth lab cleanup (page. 163-170 in the Participants Guide), you may want to do the following activity. Divide the students into small groups. Have them brainstorm what steps they would take to clean up a meth lab if they were in charge of creating the work plan. Have the group write their steps on a flip chart and when the groups report back, compare their steps to the ones in the Participant Guide.

Material is included in the text covering a large number of work practices such as:

Tiered response tactics

Steps to cleanup:

Air it out

HVAC

Gross Cleanup

Cleanup

Plumbing/Server

Septic

Painting

Sample

Write a report

Confined Space

Lock Out

Fire Prevention

Spill Control

Heavy Equipment Operator

Motor Vehicles

Ladders and Scaffolding

Illumination

Sanitation

Handling Materials Safety

As an instructor, it is important to know your audience. Some of this material is review for those with good 40-hr programs.

Instructions for Work Practices Lab

This lab, beginning on page 187 in the Participant Guide, is divided into four activities which occur concurrently. The class should be divided into four groups and rotate through each activity. Minimal PPE is recommended, as more involved work with PPE will occur with the final simulation activity at the end of this course. A minimum of four instructors is needed to successfully present these activities, one for each station. If the class is small, divide into three groups instead, and have one station empty during the rotation. Trainees should go through all four stations.

These activities may be modified to suit the needs of trainees.

Instructions for each of four activities follows. Note that specialized equipment and supplies are needed. Construction of a simulator for duct cleaning is also needed. Adequate preparation time is essential. Make copies of checklists for each participant.

WORK PRACTICES

Station #1: Rug Removal

PPE

- Tyvek suits
- Gloves
- Work boots

Equipment and Supplies

- 12' X 15' rug and double stick rug tape depending on class size may need two rugs
- 6 mil poly
- duct tape
- GloGerm Powder
- UV light with extra batteries
- trash can
- Performance checklist with clipboard and extra pens for each trainee

Organization

- Lay out the rug and double stick tape it to the floor.
- Spread GloGerm Powder on the rug.
- Have 6 mil poly and tape in team assembly area.

Instructions

- Team should assemble the necessary equipment from available supply and develop a strategy
- Team reviews strategy with instructor
- Instructor and team members don PPE
- Using buddy system, two team members should roll the rug, wrap in poly, tape, and remove to designated drop off area. If time permits, other members of the team should experience rug removal.
- Instructor critiques rug removal, using UV light examine if GloGerm powder was transferred to shoe and/or hands of trainees
- Team discusses disposal of PPE. What about decontamination, necessary?

- Team members complete performance checklist, which are reviewed and initialed by the instructor

Station #2: Lock-Out/tag out

Equipment and Supplies

- Mock power source to be locked out
- Several lockout tags
- Performance checklist with clipboard and pens for each trainee

Organization

- Prepare lock-out tags in various stages of completion
- Copies of performance checklist
- Mockups of different power sources to be locked out.

Instructions

- Team should examine lock-out tags, and determine which is complete
- Team should identify three hazards that could be minimized by lockout procedures
- Team should properly lockout/tag out mock power sources
- Team should discuss importance of lockout SOPs and other SOPs at meth lab sites
- Team members complete performance checklists which are reviewed and initialed by the instructor

Station #3: Duct Cleaning

PPE

- Tyvek suits
- Gloves
- Half face respirator
- Eye protection

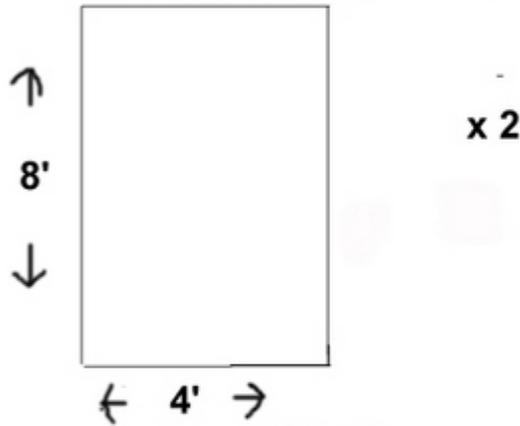
WORK PRACTICES

Duct Cleaning Mock Up:

- | | |
|------------------------|-----------------------|
| 10 - 2'x4'x8' | Paint |
| 1 - 4'x8'x1/2" drywall | Paint brush or roller |
| 1 - 4' long airduct | Drywall screws |
| 1 - airduct cover | Nails or screws |

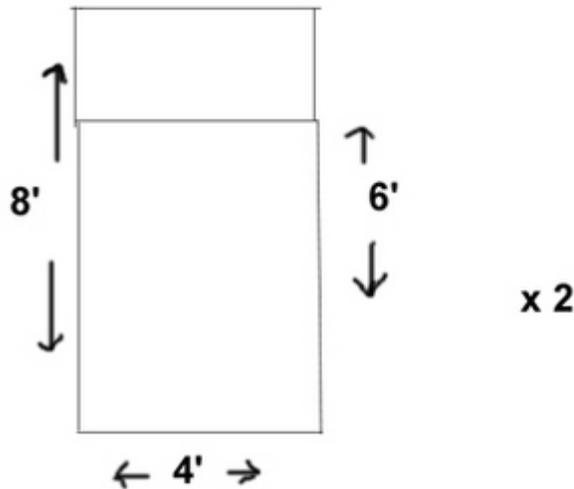
Step 1:

Build two 2x4 rectangles 4' wide by 8' tall

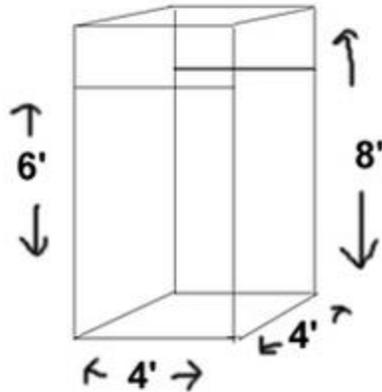


Step 2:

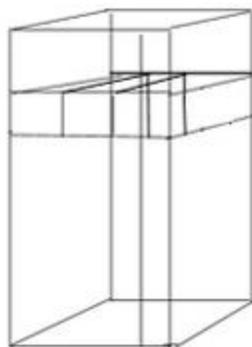
At 6' high place a 2x4 between the two, 8'. 2x4's for both rectangles



Step 3:
Connect two 2x4 rectangles 4' apart with 4' 2x4's



Step 4:
Attach another 2x4x4' across the rectangle above the one at 6' so that the flange of the duct can be attached in the middle. Attach the 4' long duct between two rectangles.



Step 5:
Cover front panel with 4'x8'x1/2" drywall.
Cut out the opening for the airduct.
Paint drywall and cover air duct with airduct cover.

WORK PRACTICES

Equipment and Supplies

- HEPA vacuum
- non-HEPA vacuum
- bucket of soapy water
- bucket of rinse water
- rags
- screw driver to remove air duct cover
- mock-up air duct
- contact paper
- baking soda
- non-wood ladder
- trash can

Organization

- Set up mock duct system and sprinkle baking soda in the duct and on the duct cover.
- Have two vacuums in assembly area along with screw driver, ladder and wash/rinse buckets.
- Cover exhaust of vacuums with contact paper.

Instructions

- Team should assemble the necessary equipment from available supply and develop a strategy
- Team reviews strategy with instructor
- Instructor and team members don PPE
- Team should remove duct cover vacuum cover and duct using non-HEPA vacuum on first half of the project and HEPA vacuum the remaining part of the project.
- Teams should wash and then rinse both duct and cover and replace cover on duct.
- Instructor should remove contact paper from the exhausts of both vacuum cleaners being careful to keep the contact paper identified with its vacuum.
- Team should examine the paper and determine the vacuum that was most effective
- Instructor should critique the exercise

- Team members complete performance checklists which are reviewed and initialed by the instructor

Station #4: Gross Cleanup

PPE

- Tyvek suits
- Gloves
- Half face respirator
- Eye protection

Equipment and Supplies

- pile of construction debris
 - broken up drywall with dust
 - broken up boards from trim
 - broken Vinyl Coated Tiles with dust
 - old overstuffed chairs and/or sofa
 - old mattress
 - broken kitchen chair and/or table
- shovels
- brooms
- Mist bottle with water
- mock “sharps” to hide in debris (suggest pencils, wooden skewers, etc.)
- Wheel barrow
- Construction grade Polybags

Organization

- Create a debris pile
- Identify disposal area
- Have tools available in trainee assembly area

WORK PRACTICES

Instructions

- Team should assemble the necessary equipment from available supply and develop a strategy
- Team reviews strategy with instructor
- Instructor and team members don PPE
- Team cleanup debris pile, minimizing dust generation, and move to designated location
- Team moves plastic bag from point of origin to destination
- Instructor should critique the exercise
- Team members complete performance checklists which are reviewed and initialed by the instructor

WORK PRACTICES

Name _____

Buddy's Name _____

**Work Practices Lab Performance Checklist
Station 1: Rug Removal**

Action	Completed/Observed	
1. Elected a leader.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Selected appropriate materials from available supplies.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Properly donned PPE.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Worked in a manner to minimize contamination.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Worked in a manner that minimizes musculo-skeletal problems.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Ensured transfer technique did not cause contamination.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Maintained Buddy System.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Other Actions Observed **Was Contact Minimized?** Yes No

Date _____ Instructor's Signature _____

WORK PRACTICES

Name _____

Buddy's Name _____

**Work Practices Lab Performance Checklist
Station 2: Lockout**

Action

- 1. Identified three hazards that could be minimized by lockout.a. Yes No
b. Yes No
c. Yes No
- 2. Identified complete lockout tag. Yes No
- 3. Discussed importance of lockout at meth lab sites. Yes No

Other Topics Discussed

Date _____ Instructor's Signature _____

Name _____

Buddy's Name _____

**Work Practices Lab Performance Checklist
Station 3: Duct Cleaning**

Action

- 1. Properly donned PPE..... Yes No
- 2. Worked in a manner to minimize contamination..... Yes No
- 3. Was the duct grill removed and cleaned?..... Yes No
- 4. Was the duct properly vacuumed? Yes No
- 5. Was the duct properly washed and rinsed?..... Yes No
- 6. Was the contact paper examined for dust? Yes No

Other Actions Observed

Date _____ Instructor's Signature _____

WORK PRACTICES

Name _____

Buddy's Name _____

**Work Practices Lab Performance Checklist
Station 4: Gross Debris Removal**

Action

- 1. Properly donned PPE..... Yes No
- 2. Were "sharps" found and properly disposed off?..... Yes No
- 3. Was debris removed with minimal dust generation? Yes No
- 4. Was debris removed with minimal musculo-skeletal exertion? Yes No
- 5. Maintained Buddy System..... Yes No

Other Actions Observed

Date _____ Instructor's Signature _____

Review Questions

If time permits, have students complete the review questions on page 195 in the Participant Guide. Answers:

1. SOPs are carefully planned and detailed work instructions to guide workers in carrying out a task safely. Thinking through the hazards in advance helps assure that every effort is made to reduce risks.
2. Hazards
Work organization (teams attendants and location monitoring)
Monitoring
Hazard control
Emergency procedures
Review and followup
Training
3. Description of the tag
Signature authority
Security of locks
Review a followup
Training
4. Hazards
Identified resources - fire/certified plumber
Emergency procedure

WORK PRACTICES

Emergency Response

Refer to Participant Guide pages 231-244.

This section outlines information which should be found in an Emergency Response Plan (ERP). If something should happen during meth lab cleanup activities, trainees need to know their ERP will have proper protocol for them to follow.

Minimum Content Requirements

The following are minimum content requirements for Emergency Response Plan:

- Elements of an ERP
- When an ERP is required
- The ICS and team member duties
- What Would You Do If... Exercise

Teaching Methods

- Lecture / discussion
- Small group activity

Reference Materials

- 29 CFR 1910.120(q)
- 29 CFR 1910.120(a) (3)
- Draft ERP or company ERP
- Preamble to 1910.120

EMERGENCY RESPONSE

Audio Visuals

- Blank overheads and a projector
- Blank flip chart (These can be helpful for making summary points and for report backs from small groups.)

Questions You May Be Asked

- Trainees may point out that no ERP is available at their workplace. This impression may be a result of incomplete training by the employer or be an apparent violation of 1910.120. The trainer must be ready to facilitate the discussion to determine if a plan does exist and how to obtain a copy for information and/or review. For contract programs, plant personnel responsible for the ERP should be identified. For general admission programs, you're on your own!
- In the case of contract programs where the employer's ERP is known to be inadequate, the instructor should be comfortable directing a discussion of approaches to problem resolution.
- Trainees may recognize that previous work may have resulted in exposure to hazardous materials because of inappropriate PPE or assignments in zones for which the workers were not properly protected. These individuals should be referred to the union representative or occupational physician.

Special Space Requirements

- Tables for small group activities

Suggested Instructor Preparation

- Review reference materials.
- Review Introduction, Work Practice Section, and this section.
- Review Draft ERP or Employer's ERP if contract program.
- Review suggested answers to exercises. Evaluate for relevancy if contract program. Develop appropriate answers, if necessary.
- Make overheads of elements of ERP.

What Would You Do If... Exercise

Explain directions for the What Would You Do If ... Exercise on pg. 240 in the Participant Guide. Have students complete the exercise. Answers:

1. Activate the alarm system, leave the area immediately, inform your supervisor, decontaminate yourself, and seek medical attention. Before re-entering without respiratory protection again, wear PPE to find out what the contaminant was that caused the smell and its concentration.
2. Inform the supervisor and make sure your friend seeks medical attention. Test the needle for bloodborne pathogens or other contaminants.

Review Questions

Have students complete the review questions on page 242 in the Participant Guide. Answers:

1. See pg. 234 in the Participant Guide.
2. Emergency: a spill or release that cannot be controlled without outside help.
3. Activate the alarm system, notify the supervisor, or carry out designated activities.
4. See pg. 238-239 in the Participant Guide.

EMERGENCY RESPONSE

Meth Lab Simulation

Refer to Participant Guide page 245.

The Meth Lab Simulation involves four tasks that trainees must complete as well as practice donning and doffing two levels of PPE that will be used on meth lab cleanup sites. The purpose of this simulation is to prepare trainees using hands-on activities for the actual work they will be doing at a meth lab cleanup site. You may optionally set up a Meth Lab Mock-Up Table, where trainees may view what a meth lab would actually look like. The four main activities of this simulation are: rug removal, duct cleaning, surface cleaning, and sealing surfaces.

METH LAB SIMULATION

Meth Lab Simulation Exercise – Rotation

8:00 – 9:00 AM Orientation to Site, Work Zones, Emergency Response Plan, Hand Signals, Exercise Stations and Rotation. Go over procedures for each of the stations listed below.

I. Description of Meth Lab Simulation Exercise Stations:

Station #1 Don Level C PPE.

Station #2 While wearing Level C PPE, the trainees will perform the following activities:

- a. Identify contamination on a rug.
- b. Roll up rug without getting contaminated or generating dust.
- c. Identify useful weight of plastic for encasing.
- d. Encase rug.
- e. Move encased rug to a set destination.

Station #3 While wearing Level C PPE, trainees will practice cleaning air ducts. They will use a vacuum cleaner without a HEPA filter and then one with a HEPA filter to demonstrate how much more effective the HEPA filter is. Trainees will practice safe removal of filters to prevent spread of contamination.

Station #4 Doff Level C PPE.

TRAINEES WILL BE GIVEN A REST PERIOD AT THE DISCRETION OF INSTRUCTOR.

Station #5 Don Level D PPE.

Station #6 While wearing Level D PPE, trainees will practice surface cleaning techniques on four types of surfaces they will likely encounter in a meth lab: linoleum, countertops, sheetrock, and a cabinet door. They will practice safe handling of bleach.

Station #7 While wearing Level D PPE, trainees will practice surface sealing procedures.

Station #8 Doff Level D PPE.

II. Group Formation/Identification

1. Divide trainees into four equal groups: Group A1, Group A2, Group B1, and Group B2. There is a maximum of six people in each group.
2. Depending on the number of trainees in the class, group sizes or number and station order may have to be adjusted.
3. Once the groups are established, some means must be used so the instructor can easily identify the various groups. Suggested methods include:
 - a. color-coded hard hats
 - b. group designation on hard hats
 - c. Tyvek suit worn with group designation attached or applied with marker
 - d. traffic or other vest with attached group designation

III. Meth Lab Simulation Layout

The Meth Lab Simulation Exercise site should be laid out in a logical and clear fashion (see attached Typical Meth Lab Simulation Layout). Each task station/area should be clearly marked. Suggested methods for marking include:

- a. signs or stakes
- b. numbers on traffic cones
- c. numbers on drums

IV. Conducting the Meth Lab Simulation Exercise

When the site is set up with the task stations/areas marked, groups established and identified, equipment readied and the Orientation complete, the Exercise is ready to begin. Begin the Exercise per the Meth Lab Simulation Rotation Schedule below. Schedule is tentative. Be aware of how quickly or slowly trainees are moving through stations and adjust schedule as needed.

METH LAB SIMULATION

Meth Lab Simulation Rotation Schedule

Group Time	A1	A2	B1	B2
9:00 – 9:20	1	1	5	5
9:20 – 9:40	2	3	6	7
9:40 – 10:00	3	2	7	6
10:00 – 10:20	4	4	8	8
10:20 – 10:40	Break at instructor's discretion			
10:40 – 11:00	5	5	1	1
11:00 – 11:20	6	7	2	3
11:20 – 11:40	7	6	3	2
11:40 – 12:00	8	8	4	4

As the groups begin to rotate, keep in mind the rotation follows a basic pattern:

- Half the trainees (Group A) will begin with the Level C PPE oriented stations.
- Group A will then divide in two, with A1 doing one station and A2 doing another.
- Groups A1 and A2 will then switch.
- Group A members will doff their Level C PPE.
- The other half of the trainees (Group B) will begin the Level D PPE oriented stations.
- Group B will then divide, switch, and doff PPE like Group A did.
- Group A and B will then switch, so that Group A will do Level D oriented stations and Group B will do Level C oriented stations.

Exercise Station Procedures

Use your best judgment when dividing trainees into groups for the Meth Lab Simulation Exercise. For example, if six trainees are assigned to move one rug, then some people won't get enough hands-on training. It would be more beneficial to the trainee to provide two rugs and split the group in half, so each trainee is more involved in the exercise. Fine tune the following procedures to best fit the needs of the trainees.

Station #1 – Don Level C PPE

Materials

- 24 sets of Level C PPE
- Several rolls duct tape
- 2 stools or small ladders

Instructor Prep

- Set out all materials
- Mark off area for Station #1
- Review and make 24 copies of Station #1 Checklist

Trainee Actions

- Help each other don Level C PPE in this order:
 - Tyvek suit
 - Boots
 - Boot cover
 - Head cover
 - Protective glasses
 - Gloves
 - Respirator
- Tape seams of boots and gloves to suit
- Fill out Station #1 Checklist after completing the station

Instructor Actions

- Assist as necessary

Station #2 – Rug Removal

Materials

- 1 or 2 rugs or pieces of carpeting up to 9'x12', based on number of trainees per group
- GloGerm oil or powder
- Various weights rollable plastic sheeting, sufficient to encase rugs
- 2 rolls duct tape
- Traffic cone
- UV light (black light)
- Trash can

Instructor Prep

- Set out all materials
- Mark off area for Station #2
- Sprinkle rug with GloGerm oil or powder to serve as the contaminant
- GloGerm oil/powder glows under a UV light
- Using the traffic cone, clearly mark a destination point where the rug must be transported to
- See Exercise Stimuli: Station #2 for optional ideas and materials
- Review and make 24 copies of Station #2 Checklist
- Remind trainees that rugs and carpeting absorb contaminants easily and are not easily cleaned, so it is safer and more cost effective to dispose of them
- Based on number of trainees per group:
 - If 5-6 trainees, assign half to one rug and half to another rug
 - If 4 or fewer, assign group to move just one rug

METH LAB SIMULATION

Trainee Actions

- While wearing Level C PPE ...
- Examine rugs and identify contamination
- Roll and encase rug in plastic, using duct tape, without generating dust or contaminating themselves
- Move encased rug to the destination point
- Fill out Station #2 Checklist after completing the station

Instructor Actions

- After trainees have finished moving the rug, shine the UV light on their PPE to see if they glow – evidence of contamination
- Return rugs to original point
- Unwrap rugs and throw plastic sheeting and duct tape into trash
- Unroll rugs
- View rugs with UV light and, if necessary, re-sprinkle rug with GloGerm oil or powder
- You may enlist trainee assistance in resetting the station

Station #3 – Duct Cleaning

Materials

- 1 or 2 ducts and attached grills
- Screwdrivers or other appropriate tool for taking grill off duct
- Vacuum cleaner with HEPA filter
- Vacuum cleaner without HEPA filter
- Contact paper
- Baking soda

- If necessary, non-wood ladder
- If outdoors, work table
- Trash can

Instructor Prep

- Set out all materials
- Mark off area for Station #3
- If indoors, have trainees work on an actual duct in the wall
- If outdoors, have length of ductwork and attached grill on worktable
- If duct is clean, simulate contamination with baking soda
- See Exercise Stimuli: Station #3 for optional ideas and materials
- Review and make 24 copies of Station #3 Checklist
- Remind trainees that duct cleaning is important to cleaning a meth lab because as air circulates throughout the ducts, contamination could spread
- Based on number of trainees per group:
 - If 5-6 trainees, assign half to one duct and half to another duct
 - If 4 or fewer, assign group to just one duct

- If indoors and there are many ducts around the room, have trainees do all different ducts instead of focusing on just one since it is difficult to simulate dust and grime build-up

Trainee Actions

- While wearing Level C PPE ...
- Unscrew grill off duct
- Vacuum grill and duct with non-HEPA vacuum cleaner
- Vacuum grill and duct with HEPA filter vacuum cleaner
- While vacuuming, hold Contact paper over exhaust to collect contaminant vacuum cleaner missed
- Decide which vacuum cleaner had cleaner exhaust (i.e. better for environment, better for trainees, more efficient)
- Practice safe removal of vacuum cleaner filters, dust bags, and/or dust receptacles
- Throw out used Contact paper
- Fill out Station #3 Checklist after completing the station

Instructor Actions

- “Reset” the grill and duct by sprinkling with baking soda.

Station #4 – Doff Level C PPE

Materials

- Trash cans
- Bin labeled “Decon Bin”
- Soap and water for washing down boots
- Separate source of soap and water for hand washing

Instructor Prep

- Set out all materials
- Mark off area for Station #4
- Review and make 24 copies of Station #4 Checklist
- Remind trainees of importance of personal hygiene at this time (hand washing)

Trainee Actions

- Help each other doff Level C PPE in this order:
 - Boot covers
 - Boots
 - Tyvek suits
 - Respirators
 - Head covers
 - Protective glasses
 - Gloves

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- Dispose of boot covers, Tyvek suits, head covers, and gloves in trash
- Place respirators and protective glasses in Decon Bin
- Wash down boots
- Fill out Station #4 Checklist after completing the station

Instructor Actions

- Assist as necessary

Station #5 – Don Level D PPE

Materials

- 24 sets of Level D PPE
- Several rolls of duct tape
- 2 stools or small ladders

Instructor Prep

- Set out all materials
- Mark off area for Station #5
- Review and make 24 copies of Station #5 Checklist

Trainee Actions

- Help each other don Level D PPE in this order:
 - Tyvek suits
 - Boots
 - Boot covers
 - Head covers
 - Protective glasses
 - Gloves
 - Dust mask
- Tape seams of boots and gloves to suit
- Fill out Station #5 Checklist after completing the station

Instructor Actions

- Assist as necessary

Station #6 – Surface Cleaning

Materials

- Squares of linoleum, sheetrock and countertop surface
- Cabinet door
- Work table
- Bleach (undiluted)
- Container to dilute bleach in

- Bucket full of soapy water
- Spray bottle filled with water
- Disposable rags
- pH paper
- Baking soda paste/solution
- Tomato juice/paste or lemon juice
- Food coloring
- Baking soda solution (weak base)
- Vinegar (weak acid)
- Utility sink or drain for wastewater disposal
- Wet vacuum cleaner (shop vac) or plastic containers

Instructor Prep

- Set out all materials
- Mark off area for Station #6
- “Contaminate” linoleum, sheetrock, countertop, and cabinet door with food coloring for a neutral contaminant (works well on sheetrock)
- A baking soda paste or solution can be applied to surfaces to simulate an alkaline contaminant (most visible on darker surfaces; use food coloring if on a lighter surface)
- Tomato juice or paste or lemon juice can be applied to surfaces to simulate an acidic contaminant
- Tomato juice may also be used to simulate blood, a biological, requiring trainees to use bleach to clean that particular surface
- See Exercise: Station #6 for optional ideas and materials
- Review and make 24 copies of Station #6 Checklist
- Based on number of trainees per group:
 - If 5-6 trainees, assign half to work with linoleum and sheetrock, while the other half work with countertop and the cabinet door
 - If 4 or fewer, assign each trainee one surface material to practice surface cleaning techniques

Trainee Actions

- Examine materials for visible signs of contamination
- Materials that are heavily contaminated should be disposed of
 - If not considered hazardous waste (usually the case), dispose of materials in the landfill
 - Use dust mask to prevent inhalation of dust if removing materials from the meth lab
- If surfaces are dusty, spray lightly with water to keep dust out of the air
- Test pH of surface; if surface is dry, apply a few drops of water
- Acids and bases found on surfaces must first be neutralized
- To neutralize an acidic surface, wash with baking soda solution

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- To neutralize a basic surface, wash with vinegar
- Retest surface and repeat if necessary
- When surface is neutral, wash with soap and water
- If blood stains or other biological materials are visible or suspected, wash with a bleach solution
- Collect waste water with a wet vacuum cleaner (shop vac) or in plastic containers
- Dispose of waste water down a sink or toilet
- Fill out Station #6 Checklist after completing the station

Instructor Actions

- Reapply food coloring, baking soda paste/solution, tomato juice/paste, and lemon juice as necessary.

Station #7 – Sealing Surfaces

Materials

- 8 squares sheetrock
- 8 cabinet doors, preferably of a light wood
- Popcorn ceiling square (optional)
- Oil-based paint
- Water-based latex paint
- Polyurethane
- MSDSs for paints and polyurethane
- Screwdriver or other appropriate tool to pry lids off paint cans
- Paintbrushes
- Labeled spray bottle with bleach solution
- Photos of mold and/or asbestos (optional)
- Scotch Tape
- Food coloring
- Work table
- Plastic tablecloth to protect work table from paint and polyurethane
- Disposable rags in case of spill
- Trash can labeled “To The Landfill”
- Sign for assistant to wear labeled “Health Department” on one side and “Asbestos Consultant” on the other
- 8 copies of the “Permission to Seal” certificate (see Appendix C)

Instructor Prep

- Set out all materials
- Mark off area for Station #7
- “Contaminate” sheetrock and cabinet door with food coloring
- Tape photos of mold to the sheetrock (optional)
- Tape photos of asbestos to the popcorn ceiling square (optional)
- Appoint an assistant to wear the “Health Department”/ “Asbestos Consultant” sign

- See Exercise Stimuli: Station #7 for optional ideas and materials
- Review and make 24 copies of Station #7 Checklist
- Make sure trainees understand that at a real meth lab cleanup site they are not to paint or seal surfaces without first cleaning several times (see Station #6 activities), but for purposes of this station, have trainees assume the sheetrock has already been scrubbed well
- Since the cabinet doors and sheetrock will be getting painted, you must have enough for each of the four groups (hence 8 listed in Materials)
- If exercise is taking place indoors and/or ventilation is insufficient to deal with paint fumes, empty paint and polyurethane cans and replace with Elmer's School Glue for a safer alternative
- Based on number of trainees per group:
 - If 5-6 trainees, divide group in half and give each half one square of sheetrock and one cabinet door
 - If 4 or fewer, assign each trainee one square of sheetrock or a cabinet door

Trainee Actions

- Examine material for level of contamination
- If the sheetrock or cabinet door is severely contaminated, trainees should decide to remove the material from the lab and dispose of it in the "To The Landfill" trash can
- If contamination is mild, trainees should decide to seal the surface
- If trainees elect to seal the surface, they must first notify the Health Department (assistant with "Health Department" sign) who will likely want the MSDS for the sealant to be used
- After obtaining permission from the Health Department, trainees will select the oil-based paint for sheetrock, as water-based latex paints have a tendency to let contaminants bleed through over time
- Trainees should select the polyurethane sealant for the cabinet doors
- Trainees will then paint the surface with the selected sealant
- If asbestos is present (as is sometimes found in popcorn ceilings), trainees should not disturb it until a certified Asbestos Consultant (assistant with "Asbestos Consultant" sign) is present and directing the cleanup activities
- Once the consultant is present, the asbestos may either be removed from the premises (severe contamination) or coated with a spray-on sealant (minor contamination)
- If mold is present, trainees should spray it with a bleach solution, scrub it (see Station #6 activities) and then allow it to dry
- If mold grows back, discard the material
- If mold does not grow back, proceed with sealing procedures
- For purposes of this station, trainees will only be required to spray "mold" with bleach
- Fill out Station #7 Checklist after completing the station

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Instructor Actions

- When trainees approach the “Health Department” (assistant), he/she will request the MSDS for the sealant trainees choose and will fill out the Permission to Seal certificate (see Appendix C) if the chosen sealant is correct
- When trainees approach the “Asbestos Consultant” (assistant), he/she will examine the contamination with trainees and explain that asbestos cleanup and/or removal is outside the scope of this training program
 - He/she will explain that the consultant may bring in outside help with specialized asbestos cleanup training
 - For purposes of this exercise, trainees are just to set aside the popcorn ceiling, to represent leaving it alone till more a specialized consultant arrives

Station #8 – Doff Level D PPE

Materials

- Trash cans
- Bin labeled “Decon Bin”
- Soap and water for washing down boots
- Separate source of soap and water for hand washing

Instructor Prep

- Set out all materials
- Mark off area for Station #8
- Review and make 24 copies of Station #8 Checklist
- Remind trainees of importance of personal hygiene at this time (hand washing)

Trainee Actions

- Help each other doff Level D PPE in this order:
 - Boot covers
 - Boots
 - Tyvek suits
 - Dust masks
 - Head covers
 - Protective glasses
 - Gloves
- Dispose of boot covers, Tyvek suits, head covers, dust masks, and gloves in trash
- Place protective glasses in Decon Bin
- Wash down boots
- Fill out Station #8 Checklist after completing the station

Instructor Actions

- Assist as necessary

Exercise Stimuli (optional)

Introduce these stimuli to trainees to make activities more interesting. Also use to tailor program to trainees' needs and interests. Feel free to add your own stimuli to this list.

Station #2 – Rug Removal

Stimulus:	Wind direction.
Proper Response:	Determine wind direction by observing wind or other weather instrument.
Resources Required:	Wind sock, pole.
Stimulus:	“Hypodermic needle” in the rug fibers. (Simulate with a staging nail or pencil.)
Proper Response:	Don leather gloves. Use pliers to pick up the “needle” and place it in a plastic biohazard container or any tough plastic container.
Resources Required:	Staging nail or pencil, leather gloves, pliers, biohazard or other tough plastic container. Do not expose trainees to real hypodermic needles.

Station #3 – Duct Cleaning

Stimulus:	Security breach.
Proper Response:	Suspend activities and alert intruder of necessity to leave the area.
Resources Required:	Individual to act as if unaware of the dangers involved in being on the site. Boundaries clearly marked with boundary tape, fence, signs, etc.
Stimulus:	Duct out of arm's reach.
Proper Response:	Acquire non-wooden ladder (wood cannot be decontaminated) and use it properly to reach duct.
Resources Required:	Non-wooden ladder.
Stimulus:	Flexible ductwork.
Proper Response:	Removal from the lab. Flexible ductwork cannot be cleaned. Brushes simply move contamination around and use of water would only lead to mold growth.
Resources Required:	Flexible ductwork.

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Station #6 – Surface Cleaning

Stimulus: Bleach undiluted.
Proper Response: Recognize hazards posed by undiluted bleach. Dilute bleach.
Resources Required: Bleach, water, container to dilute bleach in.

Stimulus: No gloves.
Proper Response: Recognize the hazard posed by using bleach without gloves. Report to instructor. Obtain and wear gloves.
Resources Required: Gloves.

Stimulus: Rinse water.
Proper Response: Identify need to collect waste water from cleaning. Collect. Put waste water down the toilet or into the sewer system as long as no solvents or degreasers are present.
Resources Required: Plastic tubs, squeegee, wet vacuum cleaner (shop vac), disposable rags, paper towels.

Station #7 – Sealing Surfaces

Stimulus: Mold.
Proper Response: Recognize presence of mold. Make sure respiratory protection is sufficient. Report to instructor.
Resources Required: Photos of mold to tape to back of sheetrock. Do not expose trainees to real mold.

Stimulus: Asbestos.
Proper Response: Make sure respiratory protection is sufficient. Report to “Asbestos Consultant”.
Resources Required: Photos of asbestos to tape to the back of sheetrock. Do not expose trainees to real asbestos.

Critique

As the simulation is being carried out by participants, pay close attention to their actions. On the checklists, make note of when a group or participant does particularly well or does a task inefficiently/incorrectly. After the simulation is over, and after a lunch break, gather trainees together in a large group.

Open a discussion on the simulation. How did the trainees like the exercise? Opinions on content and duration are welcome. What do trainees think went well? This is a learning experience for the trainees, so errors are also expected. View errors as a chance to improve. Invite trainees to discuss what they could do to improve their performance during real meth lab cleanup activities. Instructors should also be afforded the opportunity to participate in this discussion.

Video tape playback can help trainees to recognize their own successes and problem areas.

Use a blackboard or a flip chart to record insightful or key points.

If any useful feedback for improving the course comes up during discussion, please forward those comments to UC, and they will be considered for the next version.

METH LAB SIMULATION

Simulation Definition

The Meth Lab Simulation is a series of exercises designed to familiarize each program trainee with the proper protocols used at a meth lab cleanup site.

Minimum Simulated Site Specifications

1. Running water available from an outside spigot or an air-driven pump (if outdoors) or an indoor spigot or water fountain (if indoors) to supply water for decontamination exercises and to provide potable water to prevent dehydration among trainees during simulation.
2. Telephone or radio to summon emergency assistance.
3. Access to adequate restrooms within 100 yards of site.
4. Physical space (parking lot, field, large indoor area, at least 150' X 100').
5. Shelter (if outdoors) or briefing room with a seating capacity of at least 30.
6. If planning to hold simulation outdoors, prepare contingency plan for bad weather.
7. Site should be situated so as to minimize public reaction or preparations should be made to deal with the public.
8. A sign should be used to indicate that training is occurring. Local authorities (police, fire, etc.) and the local media (print, radio, and television) should be notified of the exercise. Also use for publicity.
9. If night exercises contemplated, provide for adequate lighting.
10. Close proximity to classroom facility is preferable.

Assumptions

1. Class size – 24 trainees maximum
2. Required equipment¹ and materials:
 - a. 24 Half-face APR with cartridges
 - b. 24 Dust masks
 - c. 24 Level C Outfits
 - i. Tyvek suit
 - ii. Boots
 - iii. Boot cover
 - iv. Head cover
 - v. Gloves
 - vi. Protective glasses
 - d. 24 Level D Outfits
 - i. Tyvek suit
 - ii. Boots
 - iii. Boot cover

¹ Additional consideration should be given to equipment maintenance costs and to the cost of expendables used during the Site Simulation Exercise.

- iv. Head cover
- v. Gloves
- vi. Protective glasses
- e. Work tables
- f. Clipboards
- g. De-fogging solution
- h. First Aid Kit
- i. Drinking fluids/supplies
- j. Barrier tape/stakes/safety cones
- k. 3 Trash cans
- l. Scotch tape
- m. 8 Rolls of duct tape
- n. 4 Stools or short ladders for suiting up
- o. 1 or 2 Rugs or pieces of carpeting up to 9'x12'
- p. GloGerm oil or powder¹
- q. Various weights rollable plastic, sufficient to encase rugs
- r. UV light (black light)
- s. HVAC duct mock-up
- t. 2 Screwdrivers
- u. Vacuum with HEPA filter
- v. Vacuum without HEPA filter
- w. Contact Paper
- x. Baking soda
- y. 2 Large plastic bins labeled "Decon Bin"
- z. Trash can labeled "To The Landfill"
- aa. 1 Linoleum square
- bb. 1 Countertop square
- cc. 9 Sheetrock squares
- dd. 9 Cabinet doors
- ee. Bleach (undiluted)
- ff. Container to dilute bleach in
- gg. Bucket of soapy water
- hh. Disposable rags
- ii. pH paper
- jj. Baking soda paste/solution
- kk. Tomato juice/paste or lemon juice
- ll. Food coloring
- mm. Vinegar
- nn. Plastic containers
- oo. 2 Spray bottles
- pp. Oil-based paint
- qq. Water-based latex paint
- rr. Polyurethane

1 GloGerm powder can be purchase online at www.glogerm.com.

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- ss. MSDSs for paints and polyurethane
 - tt. Paintbrushes
 - uu. Plastic tablecloth
 - vv. Sign for assistant to wear labeled “Health Department” on one side and “Asbestos Consultant” on the other
 - ww. 24 copies of each Station Checklist
 - xx. 8 copies of the Permission to Seal certificate (see Appendix C)
3. Optional equipment and supplies
 - a. Wind sock
 - b. Pole
 - c. Staging nail or pencil
 - d. Leather gloves
 - e. Pliers
 - f. Biohazard or other tough plastic container
 - g. Non-wood ladder
 - h. Flexible ductwork
 - i. Squeegee
 - j. Wet vacuum cleaner
 - k. Photos of mold and asbestos
 - l. 1 Popcorn ceiling square
 4. Required Trainee Attire for Site Simulation
 - a. Must wear steel toed shoes.
 - b. If eyeglasses are worn, must wear. **No contacts²** can be worn with respiratory protection.
 - c. Work clothes (that may be stained).
 5. **Trainees must provide a doctor note verifying physical capabilities before being permitted to suit up and participate.**

Trainee Stations at Simulated Meth Lab

1. Don Level C PPE
2. Rug Removal
3. Duct Cleaning
4. Doff Level C PPE
5. Don Level D PPE
6. Surface Cleaning
7. Sealing Surfaces
8. Doff Level D PPE

² Consideration needs to be given to how those workers who wear glasses can be accommodated (special kits can be purchased for F/F masks).

**Meth Lab Simulation Performance Checklist
Station 1 – Don Level C PPE**

Think about when you were donning Level C PPE.

Please answer the following questions by checking the appropriate line.

- 1. Did you suit up in Level C PPE? Yes No
- 2. Did you put the PPE on in this order? Yes No
 - a. Tyvek suit
 - b. Boots
 - c. Boot covers
 - d. Head cover
 - e. Protective glasses
 - f. Gloves
 - g. Respirator
- 3. Did you or your partner tape seams around your boots?..... Yes No
- 4. Did you or your partner tape seams around your gloves?..... Yes No
- 5. Did you encounter any difficulties? Yes No
- 6. List any difficulties you encountered in the space below.

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Meth Lab Simulation Performance Checklist Station 2 – Rug Removal

Think about when you were encasing and removing rugs.

Please answer the following questions by checking the appropriate line.

1. Were you suited up in Level C PPE?..... Yes No
2. Did you and your partner identify contamination on the rug? Yes No
3. Did you and your partner roll up the rug without generating dust? Yes No
4. Did you and your partner succeed in encasing the rug in plastic? Yes No
 - a. What weight of plastic did you use?

5. Did you and your partner move the rug the required distance?..... Yes No
6. Was the rug difficult to handle?..... Yes No
7. Did the UV light show that you had gotten contaminant on yourself? Yes No
8. Did you encounter any difficulties?..... Yes No
9. List any difficulties you encountered in the space below.

**Meth Lab Simulation Performance Checklist
Station 3 – Duct Cleaning**

Think about when you were practicing cleaning ducts.

Please answer the following questions by checking the appropriate line.

- 1. Were you suited up in Level C PPE? Yes No
- 2. Did you or your partner unscrew the grill off the duct?..... Yes No
- 3. Did you or your partner use a vacuum cleaner with a HEPA filter?..... Yes No
- 4. Did you or your partner practice safe removal of the filter?..... Yes No
- 5. Did you or your partner have to use a ladder? Yes No
- 6. Did you encounter any difficulties? Yes No
- 7. List any difficulties you encountered in the space below.

METH LAB SIMULATION

Meth Lab Simulation Performance Checklist Station 4 – Doff Level C PPE

Think about when you were doffing Level C PPE.

Please answer the following questions by checking the appropriate line.

1. Did you doff your Level C PPE?..... Yes No
2. Did you doff the PPE on in this order?..... Yes No
 - a. Boot covers
 - b. Boots
 - c. Tyvek suit
 - d. Respirator
 - e. Head cover
 - f. Protective glasses
 - g. Gloves
3. Did you put your boot covers in the trash?..... Yes No
4. Did you wash down your boots?..... Yes No
5. Did you put your Tyvek suit in the trash?..... Yes No
6. Did you put your respirator in the decon bin?..... Yes No
7. Did you put your head cover in the trash?..... Yes No
8. Did you put your protective glasses in the decon bin?..... Yes No
9. Did you put your gloves in the trash?..... Yes No
10. Did your Tyvek suit or gloves have any rips?..... Yes No
11. Did you wash your hands afterwards?..... Yes No
12. Did you encounter any difficulties?..... Yes No
13. List any difficulties you encountered in the space below.

**Meth Lab Simulation Performance Checklist
Station 5 – Don Level D PPE**

Think about when you were donning Level D PPE.

Please answer the following questions by checking the appropriate line.

- 1. Did you suit up in Level D PPE?..... Yes No
- 2. Did you put the PPE on in this order?..... Yes No
 - a. Tyvek suit
 - b. Boots
 - c. Boot covers
 - d. Head cover
 - e. Protective glasses
 - f. Gloves
 - g. Dust mask
- 3. Did you or your partner tape seams around your boots? Yes No
- 4. Did you or your partner tape seams around your gloves?..... Yes No
- 5. Did you encounter any difficulties?..... Yes No
- 6. List any difficulties you encountered in the space below.

METH LAB SIMULATION

Meth Lab Simulation Performance Checklist Station 6 – Surface Cleaning

Think about when you were practicing surface cleaning techniques.

Please answer the following questions by checking the appropriate line.

1. Were you suited up in Level D PPE?..... Yes No
2. Did you personally work with the following surfaces?
 - a. Linoleum..... Yes No
 - b. Sheetrock..... Yes No
 - c. Countertop..... Yes No
 - d. Cabinet door..... Yes No
3. Did you or your partner test the pH of the surfaces?..... Yes No
 - a. List the pH: _____ _____
 _____ _____
4. Did you or your partner dilute bleach?..... Yes No
5. Did you wear gloves while handling bleach?..... Yes No
6. Did you use soapy water to wash surfaces?..... Yes No
7. Did you collect waste water?..... Yes No
8. Did you dispose of waste water down the drain?..... Yes No
9. Did you encounter any difficulties?..... Yes No
10. List any difficulties you encountered in the space below.

**Meth Lab Simulation Performance Checklist
Station 7 – Sealing Surfaces**

Think about when you were deciding whether or not to paint/seal surfaces.

Please answer the following questions by checking the appropriate line.

- 1. Were you suited up in Level D PPE?..... Yes No
- 2. Did you decide to remove any of the samples from the lab?..... Yes No
- 3. Did you decide to seal any surfaces?..... Yes No
- 4. If yes, did you notify the “Health Department”?..... Yes No
- 5. Did you select oil-based paint and/or polyurethane for sealants
(i.e. not water-based latex paint)?..... Yes No
- 6. Did you paint the surface with the sealant?..... Yes No
- 7. Did you encounter any asbestos?..... Yes No
- 8. If yes, did you notify the “Asbestos Consultant”?..... Yes No
- 9. Did you encounter any mold?..... Yes No
- 10. If yes, did you spray it with bleach?..... Yes No
- 11. Did you encounter any difficulties?..... Yes No
- 12. List any difficulties you encountered in the space below.

METH LAB SIMULATION

Meth Lab Simulation Performance Checklist Station 8 – Doff Level D PPE

Think about when you were doffing Level D PPE.

Please answer the following questions by checking the appropriate line.

1. Did you doff your Level D PPE?..... Yes No
2. Did you doff the PPE on in this order?..... Yes No
 - a. Boot covers
 - b. Boots
 - c. Tyvek suit
 - d. Dust mask
 - e. Head cover
 - f. Protective glasses
 - g. Gloves
3. Did you put your boot covers in the trash?..... Yes No
4. Did you wash down your boots?..... Yes No
5. Did you put your Tyvek suit in the trash?..... Yes No
6. Did you put your dust mask in the trash?..... Yes No
7. Did you put your head cover in the trash?..... Yes No
8. Did you put your protective glasses in the decon bin?..... Yes No
9. Did you put your gloves in the trash?..... Yes No
10. Did your Tyvek suit or gloves have any rips?..... Yes No
11. Did you wash your hands afterwards?..... Yes No
12. Did you encounter any difficulties?..... Yes No
13. List any difficulties you encountered in the space below.

Appendix A

Appendix A

Appendix A: Personal Protective Equipment

Refer to Participant Guide, Appendix A , pages 259-316.

This chapter focuses on Personal Protective Equipment (PPE) that is required by OSHA for all individuals working with or around hazardous materials. There are two sections; one which focuses on respiratory protection and one which focuses on chemical protective clothing. Since much of meth lab cleanup takes place after most of the chemicals have been removed from the lab and since all fo the class has already taken a 40 hour site worker course we have allotted only 30 minutes for this section and deal with protection Levels C and D.

Minimum Content Requirements

The following are minimum content requirements for Respiratory Protection.

Review:

- Respirator selection focusing on Air Purifying Respirators
- Types of respirators
- Fit-tests and routine user checks
- Protection Factor
- Protective clothing Levels C and D
- Precautions when wearing CPC
- Permeation
- Typical PPE worn during meth lab cleanup

Appendix A: PPE

Teaching Methods

- Small group activity

Audio Visuals

- Display different types of Air Purifying Respirators
- Display Levels C and D protective clothing

Suggested Instructor Preparation

- Review reference materials
- Review this section in the Participant Guide
- Assemble equipment for Display

Reference Materials

- OSHA Standard 29 CFR 1910.120 and 134 including the Appendix materials
- Four Agency Guide
- NIOSH Guide to Industrial Respiratory Protection
- For contract programs, review company respirator program

Special Space Requirements

- Table for display of PPE

Discussion

Since this material is largely review and is scheduled for only 30 minutes, break the class back into their small groups and have them answer the scenarios found on page 283. Provide flip chart paper and markers so they can list the PPE needed for each scenario. After 15 minutes bring the class back and have the groups report back. Post flip chart paper with answers on the wall. Make sure that the important reviews in the minimum content are highlighted.

Answers to Scenarios on Page 287:

1. Gloves, Boots, disposable coveralls safety glasses, respiratory protection.
2. Sturdy leather work boots and gloves to protect against needle sticks and high-temperature clothing in case of an explosion. Safety glasses will protect the eyes against any flying debris in the event of an explosion.
3. Do not approach the waste. Notify authorities. They should wear chemical protective gloves and work boots, a splash apron and safety glasses.

If time permits you can refer the students to their Participants Guide where they will find listing of what is required for Levels C and D. These can be used to generate discussion of what hazard each item (PP. 298-299) it protects against. This would make an excellent review of the material in the chapter.

Review Questions - Respiratory Protection

As time allows, have students complete the review questions on page 290 in the Participant Guide.

Answers:

1. Respiratory protection is needed when there are contaminants in the air which could affect the worker's health and/or safety and when there is an oxygen-deficient atmosphere.
2. Routine positive and negative-pressure checks are necessary to ensure the respirator is working on a consistent basis.
3. Medical exams are required for persons who use respirators to make sure they are not suffering adverse health effects from contaminants which, unbeknownst to them, slipped past the respirator.
4. It is important to properly maintain respirators to keep them in top working order to best protect the wearer.
5. See pg. 279 in the Participant Guide.

Review Questions - Chemical Protective Cleaning

As time allows, have students complete the review questions on page 315 in the Participant Guide. Answers:

1. Types of PPE are respiratory protection and chemical-protective clothing (gloves, boots, coveralls, aprons, safety glasses, face shields, hard hats, etc.).
2. Instructor must discuss.
3. See pg. 306 in the Participant Guide.
4. See pg. 307 in the Participant Guide.
5. PPE should be replaced when it is torn, degraded, or no longer offers adequate protection to the wearer.

Appendix B

Appendix B

Appendix B: Decon

Refer to Participant Guide, Appendix B , pages 317-335.

On the typical meth lab cleanup job a hazardous waste type decontamination line is not set up. While there may be times that decontamination of personnel and/or equipment is necessary, it is just not typically set up in a regimented fashion as it would be on a hazardous waste site cleanup. This appendix describes one of the procedures used to protect meth lab cleanup workers, the surrounding community, and the environment from the materials found in a meth lab. The basic principles of decontamination are covered in this section.

Minimum Content Requirements

The following are minimum content objectives for Decontamination.

Review:

- Definition and purpose of decontamination
- Decontamination methods: physical and chemical removal
- Typical scenarios when decontamination becomes necessary at a meth lab cleanup

Teaching Methods

- Lecture/Discussion
- Small Group Activity

Appendix B: Decon

Reference Materials

- Four Agency Guide
- 1910.120(k)
- For contract programs, consult relevant decon practices from company

Audio Visuals

- Flip chart, markers, tape

Special Space Requirements

- None

Suggested Instructor Preparation

- Study notebook materials
- OSHA 1910.120(k)

Ideas for discussion:

Break the class into small groups (you might want to shift people around to different groups to change the dynamic). Ask the groups to brain storm what situations might occur at a meth lab cleanup site that would require decontamination. Have the groups list their ideas on a flip chart and bring the groups back to report.

Some situations might be:

1. Testing shows that the contents of the plastic jug hidden above the ceiling that came crashing down during demolition, splashing you and two others, has a pH of 13.
2. Tools fell into a cistern that was used for chemical disposal by the cookers, and you want to save the tools for the next job.
3. A plastic bag of contaminated debris broke as you tried to hoist it into the dumpster. Now you look like a snowman.

After the class returns and report their situations you could institute a general discussion to list the actual steps in the decontamination process for each situation.

MSDS and NIOSH Pocket Guide Exercise

Select a chemical of interest (such as ammonia). Obtain an MSDS from the internet for teaching purposes.

Conduct the exercise as:

1. NIOSH Pocket Guide Exercise, available on MWC website.
(www.uc.edu/mwc)
- or 2. Use MSDS to complete exercise, page 130
- or 3. NIOSH Pocket Guide Exercise, page 98 of Participant Guide

Note: Instructor preparation includes obtain resources, duplicate forms, assure correct answer list available. If time allows, use both resources and complete the following worksheet. Discuss differences in information, if there are some for the chemical selected.

See NIOSH Pocket Guide Directions - page 77

See MSDS background - pages 122-129

Appendix B: Decon

HAZARDOUS MATERIALS FACT SHEET

Information gathered from MSDS and NIOSH Pocket Guide :

Chemical Name	MSDS	NIOSH Pocket Guide
DOT Hazard Class		
Odor Threshold		
Solubility in water		
Specific Gravity		
Vapor Density		
Vapor Pressure		
Flash Point/ LEL/ UEL		
pH		
Incompatible Materials		
Hazardous Decomposition Products		
Major Routes of Exposure		
Acute Hazards		
Chronic Hazards		
OSHA PEL/ STEL/ IDLH		

Purpose: To practice performing a hazard assessment for a material at a meth lab

Directions: Using the Hazardous Materials Fact Sheet, answer the following questions.

Performance Skills Checklist

Activity	Yes	No
1) Did you list the DOT Hazard Class?		
2) Did you list the UN Number?		
3) Did you list the odor threshold?		
4) Did you list the flash point?		
5) Did you list the LEL?		
6) Did you list the pH?		
7) Did you list the incompatible materials?		
8) Did you list the hazardous decomposition products?		
9) Did you identify inhalation hazards?		
10) Did you identify skin hazards?		
11) Did you identify acute and chronic hazards?		
12) Did you identify the PEL, SEL, and IDLH for the material?		

Appendix B: Decon

Appendix C

Appendix C

Simulated Meth Lab Emergency Response Plan

I. Introduction

- A. The Meth Lab Simulation Exercise is a complex multi part exercise which integrates much of the training of the Meth Lab Decon Program into a hands-on simulation where attendees don and perform tasks in Levels C and D of respiratory and personal protective equipment.
- B. As with any hands on simulation or exercise, there are numerous potential safety hazards. In order to insure that instructors and attendees are aware of these potential hazards and how to react to them, the minimum safety requirements enumerated below must be implemented during every Meth Lab Simulation Exercise.

II. Safety Briefing

Before the Meth Lab Simulation Exercise is started, all program attendees will receive a safety briefing which covers the contents of this plan. (May want to have students sign a document to acknowledge receipt of briefing.) If in-suit radios are not used, a clear set of hand signals must be established, verified, and used during exercise if PPE will get in the way of regular verbal communication.

III. Emergency Briefing

- A. Emergency communications equipment (telephone, cell phone, 2-way radio) will be present on the site.
- B. Communications equipment will be verified to be working before the Exercise begins.
- C. Emergency telephone numbers and directions to the site will be posted at each telephone on the site.
- D. Maps to the nearest treatment center should be posted in the event it is elected to transport a non-emergency case for treatment.

IV. Emergency Medical Treatment

- A. At least one instructor present on the site shall have current certification in or the equivalent of the Red Cross Basic CPR course (8-hour).
- B. A standard First Aid Kit shall be available for use during the Meth Lab Simulation Exercise.
- C. Use of standby EMS crew is preferable (if available) instead of the above.

V. Site Access

- A. There shall be at least two entrance/exit points to the simulation site.
- B. If the Meth Lab Simulation Exercise is conducted in a public area, a sign shall be posted identifying it as a training simulation.

VI. Physical Hazards

- A. Heavy lifting and physical exertion will be required. Extra caution is required because of the additional stresses from PPE wear. Use of proper lifting technique is essential.
- B. The bulky, heavy PPE increases potential for falling because it restricts range of motion and changes the center of gravity. The extra weight also increases risk of injury from a fall. These problems will be magnified if the simulation site is not on level ground. The need for caution and attention to balance and dexterity must be emphasized. Non-suited safety person must stay close to each suited person.
- C. Handling and moving heavy materials is always hazardous, but even more so in PPE. All instructors and course attendees on site are required to wear safety shoes. Extra care and attention is required to protect the hand from pinching or crushing injuries.

VII. Heat Stress

- A. Heat stress due to wearing heavy equipment and chemical protective suits must be a major concern in summer months and cannot be ignored even in cold weather.
- B. All attendees should be familiar with heat stress from classroom presentations and be able to recognize it.
- C. Adequate drinking water and electrolyte replacements (e.g. Gatorade) must always be available. At high heat stress levels up to 2 liters per hour of liquid may be required by each person to maintain body fluid levels.
- D. Air temperature and humidity should be monitored before suits are donned. This information is available from the National Weather Service.
- E. The lead instructor on site must monitor heat stress condition and adjust work/rest times and breaks to insure everyone drinks enough fluid.
- F. All instructors and attendees must insure they drink adequate liquids to avoid becoming a heat casualty.
- G. Shaded break area is recommended.
- H. Cool weather may present opposite problem as suit is removed, person could chill from cold air hitting body.

VIII. Wearing of Level C and D

- A. Wearing of Level C and D protection presents additional hazards which rate attention:
 - 1. Weight – The additional weight increases stress, and affects mobility and balance.
 - 2. Claustrophobia – Some people cannot handles being enclosed in a respirator or suit. They must be calmed and removed from the suit.
 - 3. Hyperventilation – The stress of suit or respirator causes some people to hyperventilate. They must be calmed and removed from the suit to restore normal breathing.

IX. Responsibilities

A. Instructors:

1. Must insure that all issues listed in this plan have been discussed in class prior to the Meth Lab Simulation Exercise.
2. Must insure all participants are aware of the hazards, how to recognize and react to them.
3. Must have at least three instructors present at all times during the Meth Lab Simulation Exercise. One shall be designated as lead and have overall responsibility for the exercise.

B. Attendees:

1. Be aware of the hazards from classroom training and the site safety briefing.
2. Watch yourself and your fellow classmates to try to avoid hazards.

X. Weather

A. In the event of adverse or inclement weather, the lead instructor must determine if the Exercise can be conducted without endangering the attendees substantially beyond the inherent risks of the Exercise under the best conditions. Weather conditions to be considered include, but are not limited to excessive heat or cold, rain, snow, and limited visibility.

B. Plans should exist for use of an alternate sheltered site to avoid disruption due to weather.

XI. Emergency Stop

A. An emergency stop signal (hand held air horns work well), separate and distinct from any signal used as a training stimulus will be used to terminate the exercise in the event of an emergency.

B. All personnel on site must know the emergency stop signal.

Appendix C

Appendix D

Appendix D

THIS CERTIFIES THAT

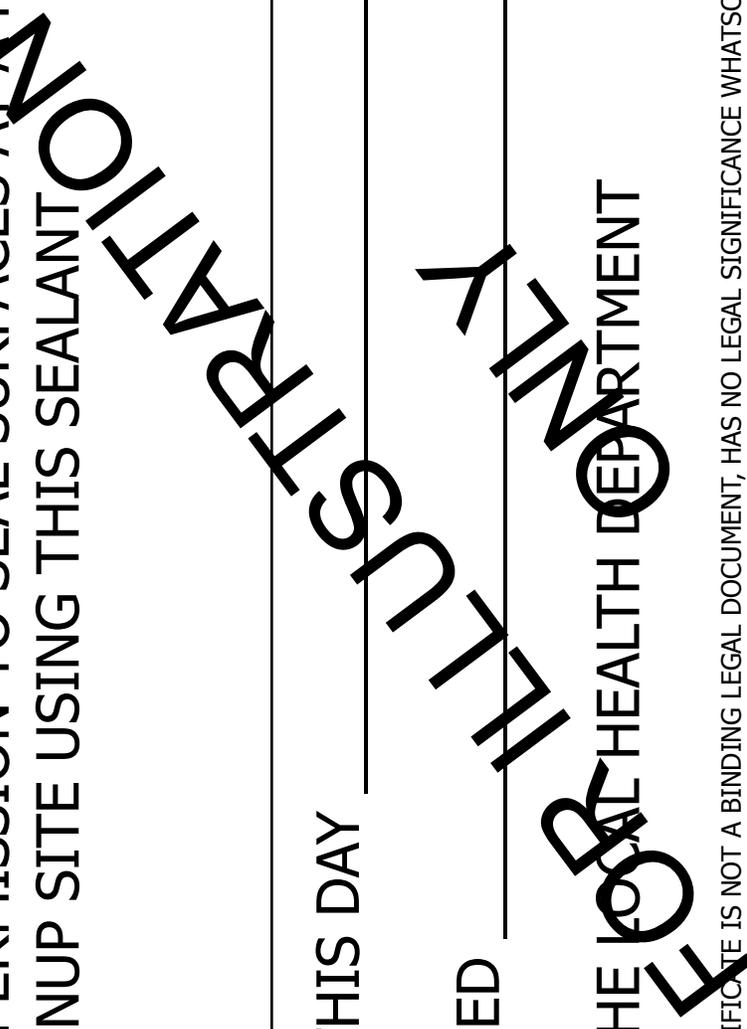
HAS PERMISSION TO SEAL SURFACES AT A METH LAB
CLEANUP SITE USING THIS SEALANT

ON THIS DAY _____

SIGNED _____

OF THE LOCAL HEALTH DEPARTMENT

THIS CERTIFICATE IS NOT A BINDING LEGAL DOCUMENT, HAS NO LEGAL SIGNIFICANCE WHATSOEVER, AND IS NOT TO BE USED OUTSIDE OF TRAINING PURPOSES.



Appendix D

Appendix E

Appendix E



**Reasonable, Appropriate, Protective (RAP)
Cleanup Response and Documentation Guidance for Properties Quarantined
Because of Clandestine Methamphetamine Laboratory (CML) Activities**

(Interim Final Guidance, June 1, 2006)

Pursuant to TCA 68-212 Part 5.

Appendix E

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I. Acknowledgements

This guidance is a distillation and incorporation of cleanup methods and procedures used in other states affected by clandestine methamphetamine production (Washington, Colorado, Minnesota, and others). A special acknowledgement and thanks to John Martyny and the researchers at the National Jewish Medical and Research Center for their research into the understanding as to how contaminants originate and migrate from the 'methamphetamine cooking' process. Lastly, KCI - *The Anti-Meth Site*, (formerly the Koch Crime Institute) deserves much praise for identifying and promoting meaningful strategies in crime reduction and prevention, KCI was a pivotal resource for this guidance.

II. Introduction

The Tennessee General Assembly passed P. Ch. 855 of the Acts of 2004 (subsequently codified into TCA 68-212-500's) addressing clandestine methamphetamine labs. The Tennessee Department of Environment and Conservation (TDEC) then promulgated Rule 1200-1-19 providing the standard of cleanliness and the process for professionals dealing with these sites to be placed on the lists maintained by TDEC.

TDEC maintains lists of cleanup contractors certified to clean properties affected by the manufacture of methamphetamine and persons qualified to do testing and certify cleanups such as a Certified Industrial Hygienist (CIH) or other TDEC certified CML Hygienist.

This guidance is designed to assist property owners on the appropriate steps necessary to remove a quarantine order because of the presence of hazardous substances and/or waste associated with the criminal production of methamphetamine, its reagents, or its precursors. This guidance also assists the CIH or other such persons or entities as listed by the Commissioner (*Cleanup Contractors and CML Hygienists*) to evaluate an appropriate cleanup response through examples of degrees of clandestine methamphetamine production and associated activities.

The Primary Goals of a RAP Cleanup Response are:

- **Achieve Overall Contaminant Mass Reduction.**
- **Thoroughly Document the Cleanup Response.**
- **Achieve a level of cleanliness that is protective of human health so a property is deemed "Safe for Human Use".**

In order to achieve these goals, it is important for the property owner, CML Hygienist and CML Contractor to understand all residual health hazards posed as a result of this criminal activity. In addition, they must be able to accurately assess the hazards, identify the appropriate cleanup procedures, and adequately photograph and document the cleanup response. Upon completion of the cleanup, the CIH or CML hygienist must present the property owner a copy of the documentation package of the cleanup and a Certificate of Fitness stating that the property is now "Safe for Human Use" with respect to methamphetamine related contaminants. If additional criminal or environmental support is required, the Cleanup Contractor must know when, where, and how to contact appropriate agencies.

III. Principle Threat Waste and Contaminants of Concern encountered at CML

Residual methamphetamine and associated hazardous waste are released during the methamphetamine manufacturing process. Airborne contaminants are absorbed into rugs, furniture, drapes, walls and other absorbing surfaces. Airborne contaminants also enter and contaminate the heating, ventilation, and air conditioning (HVAC) system. Spills are common and affect floors, walls, appliances, and other surfaces. Hazardous waste is frequently dumped into sinks, toilets, and bathtubs. This leaves contamination in the waste water system. Law enforcement and health agencies have found that levels of iodine, phosphine, and hydrochloric acid are likely to exceed current occupational standards during a cook using the red phosphorous method. Hydrochloric acid levels were especially high during the final "acidification stage," often exceeding the NIOSH "Immediately Dangerous to Life and Health" (IDLH) level. Large amounts of methamphetamine are also released into the air and deposited on most items and on horizontal and vertical surfaces throughout the building. 'Cooking' can release as much as 5,500 micrograms of methamphetamine per cubic meter into the air, and deposit as much as 16,000 micrograms per 100 square centimeters onto surfaces. Concentrations of iodine gas (a common byproduct of methamphetamine production) of less than one part per million can cause severe respiratory distress. Iodine can be spilled or adsorbed to surfaces where it can sublime to air. The IDLH for iodine in air is 2 parts per million. The anhydrous ammonia (NAZI) method also shares many of these contaminants. With this base insight into the potential hazards associated with the clandestine methamphetamine laboratory process, it is clear that both residual methamphetamine and hazardous waste generated during the manufacturing process pose a threat to human health, and render the property 'Unsafe for Human Use'.

The Principal Threat Waste (PTW) and Contaminants of Concern (COC) resulting from the manufacturing process may be in the form of corrosive waste sludge and/or as residues of a variety of volatile organic compounds (VOCs), metals, acids and bases. Some of the chemicals used in the process include but are not limited to hydriodic acid, hydrochloric acid, sulfuric acid, sodium hydroxide, red phosphorus, hydrogen peroxide, naphtha, Freon, chloroform, acetone, benzene, toluene, ethyl ether, acetic acid, methyl-ethyl-ketone, hypophosphorus acid, yellow phosphorus, anhydrous ammonia, lithium, sodium, isopropyl alcohol, ethyl alcohol, and methanol. The residual COC and PTW may be contained in or on absorbent materials, ceiling tiles, walls, floors, counter-tops, appliances, children toys, linen, drapes, furniture, mattresses, clothing, soil, waste water systems, HVAC systems, range vent hoods, etc. For more information on the hazards associated with the chemicals see Appendix A.

Albeit rare, it is possible that bulk chemicals, reagents, and methamphetamine oil could remain on the property. In most cases law enforcement agencies and their contractors remove bulk chemicals, paraphernalia, and manufacturing related items. However, if suspicious items are discovered, a hazardous materials specialist should remove them and properly dispose of them. Things as simple as a garbage bag full of containers or a bucket of cat litter may contain deadly amounts of toxic vapors, and the vapors may be released when the items are disturbed. A garbage bag of containers with methamphetamine related residues could easily contain enough phosphine gas to cause permanent pulmonary damage with a single exposure. Consult law enforcement before proceeding to ensure these items are not important evidence.

One of the more significant hazards when decontaminating a methamphetamine lab can be hypodermic needles. Users who inject methamphetamine are much more likely than the average population to have hepatitis or HIV/AIDS. Methamphetamine labs are frequently strewn with copious amounts trash that can hide carelessly discarded hypodermic needles. Needles have been found in many unlikely places such as in furniture, mixed in other garbage, on the floor or intentionally hidden in unexpected places for concealment. While HIV virus is unlikely to survive in an old hypodermic needle for more than a day, hepatitis pathogens can survive for a week or more. Because of the ease with which these items can puncture personal protective equipment (PPE), extra caution should be taken when a hypodermic user's lab is being decontaminated. Tough, puncture resistant boots and over-gloves are appropriate in these situations.

IV. Worker safety

The residual chemicals and contents can easily injure an individual cleaning a former CML. TDEC highly recommends that only trained professionals perform cleanups. The physical and chemical hazards are sometimes hidden. Chemicals present in CML residues are sometimes incompatible with chemicals used in cleaning. Appropriate training and protective equipment are extremely important for the safety of cleanup workers. Applicable OSHA rules (<http://www.osha.gov/>) apply to these cleanup responses for workers and Supervisors. Discipline in the use of protective equipment and adherence to safety procedures is also important. The work involved in a CML cleanup can be hot and tiring creating the temptation to remove equipment and cut corners on safety. Please see the TDEC website for training opportunities. <http://www.state.tn.us/environment/dor/meth/>

V. Fate and Transport of COC and PTW

When a methamphetamine lab is in operation, hazardous chemicals are usually released. These releases can range from vapors seeping through walls and being pulled through ductwork, to spills soaking into porous materials, or disposal activities of waste materials inside and outside of the structure.

The acid vapors, solvents, methamphetamine, drug byproducts and other vapors can redeposit on and in insulation, wallboard, carpet, ductwork, furniture, appliances or almost any other surface. Once re-deposited, the residues can be tracked out the door on shoes or clothing. Some of the chemicals can volatilize once again when humidity and temperature conditions change. Depending upon concentration, this could possibly cause an inhalation or flammable hazard. In addition, vapors containing methamphetamine, its byproducts, volatile organic compounds (VOC), metals, acids, and bases will generally travel together within a dwelling.

After adequate ventilation of contaminated areas, most solvent vapors will not pose an immediate threat to human health. Solvents tend to evaporate easily and dissipate when ventilated. For most of these solvents, the physical law of conservation of mass requires a substantial spill or continuing source for them to maintain a toxic concentration over a long period of time. Similarly, phosphine gas, a highly toxic byproduct of the Red-P manufacturing process, is a concern during and shortly after the actual 'cook'. However, since it is so reactive and dissipates rapidly it is not likely to have a long residence time when the structure is ventilated adequately.

Spills are very common in methamphetamine labs. Solvents, red phosphorous, iodine and other chemicals can leave hazardous vapors or residues on either hard or porous surfaces. Those on porous surfaces can have considerable residence

Appendix E

times. Like residues from vapors, the residues from spills can be tracked from place to place on shoes, clothing, toys, and other items of people present during cooking or cleanup. Spills may also be a persistent source of volatile chemicals. Spill areas should be targeted for removal or thorough cleaning.

A primary route of disposal for principle threat waste is the waste water system. Sinks and toilets provide a tempting route of disposal for the large amounts of byproducts (hazardous waste sludge) that result from drug production. The sludge in turn frequently clogs p-traps and toilets making the waste water system inoperable, and possibly contaminating the septic field depending on degree of drug production. Fortunately, many of the microorganisms in a septic system can break down the hazardous chemicals. If, on the other hand, the amount of drug production is great or the lab has been operating for months to years, extreme pH conditions or large amounts of solvent may overwhelm it which will require the system to be remediated by informed professionals. Municipal sewer systems can take these by-products miles from the clandestine lab. Fortunately, this transport action within a municipal sewer system has a tendency to dilute the problem, so for many cases a simple notice of the problem to the sewer authority may be a sufficient remedial action. See Appendix C.

Another key transport mechanism in methamphetamine labs is the heating, ventilation and cooling (HVAC) system. Intakes from the HVAC or other air duct systems can pull in hazardous vapors and redistribute them to every room attached to the system. Residues can accumulate in the ductwork, filter and blower mechanism (typically at low temperature and low air movement) and then off-gas later (typically at high temperature and high movement). Depending on the tier level of the response, a cleaning / removal of the ductwork and blowers may be appropriate, and air filters should be replaced during any methamphetamine lab remediation.

Below are examples of chemicals that may be encountered, the transport mechanisms, location of contaminants, and its persistence on the quarantined property.

- **Anhydrous Ammonia** - tends to evaporate - does not tend to leave a residue - easily removed by ventilation
- **Phosphine gas** - always in gaseous form - reacts with other chemicals in the environment and degrades rapidly - dissipates with ventilation
- **Methamphetamine** - vaporizes during production and deposits as residue - resides as residue on surfaces - may be persistent on surfaces
- **Acids** - released as vapor during production or as a spill - deposited as residue - reside on surfaces until wetted - long residence time
- **Solvents** - released as vapor during production or spilled - absorb into porous surfaces and evaporate over time - persistence is related to spill volume, the extent of perfusion into porous materials, and environmental conditions
- **Red Phosphorous** - released as spill - resides as residue - indefinitely
- **Iodine** - released as spill - resides as residue - indefinitely - may sublime into iodine gas, a toxic respiratory irritant
- **Lead** - released as vapor or as spill - resides as residue or dust - infinite residence
- **Mercury** - released as vapor or as spill - resides as metallic residue or as a gas - indefinite residence time.
- **Lithium** - released as spill or battery pieces - resides in spill residue or black, metallic, ribbon-like chunks - infinite residence
- **Alkalis (Lye)** - released as spill, resides as residue or dried spill, indefinite residence
- **Alcohols (methanol)** - released as spill - absorb into porous surfaces and evaporate over time - persistence is related to spill volume, the extent of perfusion into porous materials, and environmental conditions

VI. Standards of Cleanliness

Rule 1200-1-19 provides the following standards of cleanliness for sites used to manufacture methamphetamine:

- **Methamphetamine:** Shall not exceed 0.1 micrograms /100 square centimeters
- **Volatile Organic Chemicals (VOC):** Shall not exceed 1 part per million (ppm) total hydrocarbons and VOCs in air under normal inhabitable ventilation conditions.
- **Mercury*:** Shall not exceed 50 nano grams per cubic meter of air under normal inhabitable ventilation conditions.
- **Lead*:** Shall not exceed 40 micro grams per square foot

* - *If it is determined that the Amalgam (P2P) process was not used, then these standards do not apply.*

VII. Analytical Methodology

The current EPA SW-846 analytical methods used to detect methamphetamine is 8270C-Modified. For lead the method is 6020. Portable analyzers with gold film absorption systems are available for mercury vapor detection. TDEC recognizes that science and technology are constantly refining analytical procedures and instrumentation. Therefore, any proven and defensible analytical methodology / technology that has a detection level lower than the 'Standards of Cleanliness' numbers can be employed. These alternate analytical methods must be thoroughly documented to ensure that data results are defensible. A photo-ionization detector (PID) can be used for VOC determinations. The correct lamps must be used and the instrument calibrated prior to screening of the VOC. The calibration of the instrument must be documented.

Less technical methods are also useful. Normal visual acuity can be used for determining if items are stained or discolored. Spray starch or sometimes water can highlight iodine residues. Intermediate range, non-bleeding, color indexed pH indicator strips can be used to ascertain if acid / alkali residues are present. The pH of surfaces should generally be between 6 and 8 if little or no acids or bases are present or if a cleanup has been effective.

VIII. Sampling Strategy and Methodology

It is TDEC's position that it is much more cost effective for the property owner and the Cleanup Contractor to make the assumption that residual contamination is present when a 'methamphetamine cook' has occurred, than to spend money to prove contamination is not present/dangerous via pre-sampling determinations. Money spent on pre-sampling events and evaluation is usually better spent towards the cleanup action and replacement of furnishings. With the exception of screening samples (e.g. - VOCs in air, pH of surfaces, drug detection sprays or spray starch for iodine detection) used to direct cleaning actions, sample collection should be performed after the cleanup action is completed. This type of sampling is called confirmatory. It confirms that the cleanup response addressed all contamination sources. Confirmatory sampling is preferred because this type of sampling is the most cost effective and defensible. When a cleanup action is implemented correctly, all contaminated surfaces should be removed, washed and/or sealed to prevent risk of exposure. Confirmatory sampling will determine if the cleanup action was successful.

Confirmatory air samples must be acquired under normal HVAC operations from locations that exhibited the highest screening detections. Surface samples must be taken from surface areas that were not replaced and must target areas that exhibited the highest screening values or visual contamination noted during the inspection. The number of confirmatory samples to determine compliance is left to the 'Best Professional Judgment' of the CIH employed to certify the living space as 'Safe for Human Use'. The rationale for the number of samples taken and their location should be included in the final report. Procedures for collecting wipe samples are given in Appendix D.

IX. Recommended Methamphetamine Cleanup Resources

To assist property owners and Cleanup Contractors in furthering their understanding of potential hazards associated with these Clandestine Methamphetamine Laboratories, the following URLs are provided as additional resources. TDEC's strongly suggests that property owners and Cleanup Contractors review these resources before undertaking cleanup responses.

KCI, *The Anti-Meth Site*

http://www.kci.org/meth_info/links.htm

National Jewish Medical and Research Center

<http://nationaljewish.org/>

Keyword: methamphetamine

Washington State Department of Health

<http://www.doh.wa.gov/ehp/ts/CDL/default.htm>

Colorado Department of Health and Environment

<http://www.cdphe.state.co.us/hm/methlab.pdf>

<http://www.cdphe.state.co.us/hm/methlabfactsheet.pdf>

Minnesota Department of Health

<http://www.health.state.mn.us>

Keyword: methamphetamine

X. Tiered Response Scenarios for RAP Cleanups

In surveying the types of crime scenes encountered by law enforcement, TDEC has noted that affected properties fall into 4 degrees, or tiers of criminal methamphetamine production. The degree of methamphetamine production directly influences the degree of potential contamination that may be encountered at one of these quarantined properties. In turn, the degree of potential contamination will directly affect the amount of sampling, removals, and cleanup procedures necessary to return the property to its appropriate reuse. Thus releasing the property from quarantine.

The following tiered response scenarios provide examples for reasonable, appropriate and protective cleanups of properties that have been quarantined as a result of the presence and or potential release of hazardous substances used in the criminal production of methamphetamine. Prior to any cleanup action the following activities must have occurred:

- **All criminal investigations of the Crime Scene are completed and permission to enter property from the designated Chief Law Enforcement Officer (CLEO) has been secured.**
- **All lab process related chemicals, waste, and paraphernalia have been removed and documented by law enforcement and their response contractors. See attachment B.**
- **A Certified Industrial Hygienists (CIH) and other such person or entity as listed by the Commissioner has been contracted.**
- **The initial assessment and inspection of the quarantined property by the Cleanup Contractor has been performed, appropriate PPE for cleanup workers has been selected, and the Hazard Assessment and Scope of Work for the appropriate Tiered Response is completed and communicated to cleanup workers.**

Tier 1 Response - (Motel/Hotel 'transient-cook' scenario with anhydrous ammonia)

Crime scene evidence suggests that the manufacturing process was initiated. Limited amounts of reagents or precursors are present and open. It is uncertain a 'cook' was completed, or 1 to 2 low-yield* Nazi 'cooks' were completed, minor spill and staining may be observed. An example of when this Tier designation would be appropriate would be where a short-term guest began the manufacturing process in a hotel, motel, State and Federal park cabin, or in a relatives' / friends' residence over the weekend.

At a minimum a typical cleanup would involve the following:

- **If suspicious items (containers with residues, tubing, odd containers of kitty litter or paraphernalia) are discovered that are apparently related to methamphetamine production, contact law enforcement immediately. If law enforcement personnel do not remove them, these items should be removed by a hazardous materials specialist and properly disposed. Also, law enforcement officials will likely be interested in any firearms encountered during cleanup. Call law enforcement for advice before touching firearms.**

- Document and photograph the cleanup action.
- Prior to the cleanup response, remove all ancillary volatile and semi-volatile chemical sources that may be located on the premise not associated with the lab process. *(Examples of VOC sources include: automotive gas, propane, automotive cleaners, aerosols, dry cleaned clothing, etc. If this task is not performed, then false positive for VOC air samples may occur.)*
- Heat and ventilate premise for 72 hours prior to cleanup. The goal of ventilating the property is to achieve non-detects prior to the cleanup response. Once non-detects are achieved, then there is no need for further confirmatory air monitoring after the cleanup is completed.
- If a minor spill is noted during the assessment *(e.g. If a can of solvent leaked on counter top or floor.)*, then the Cleanup Contractor should target that area for an appropriate and thorough cleaning or removal.
- Screen air for VOCs. Representative air samples must be acquired while normal, inhabitable HVAC ventilation is occurring and target areas of spills for cleaning..
- The level of OSHA certification for cleanup workers and choice of PPE is a judgment call for the Cleanup Contractor and his/her employees to make.
- Using appropriate PPE, the cleanup workers shall thoroughly clean all hard surfaces with appropriate cleansers. Commercially shampoo rugs, steam clean mattress and cloth furniture, and have bed linens and drapes commercially laundered. Secure cleaning receipts for documentation purposes. Have cleanup workers sign off on cleanup checklist that work was performed.
- Collect any clothing or items left behind by the clandestine lab operator or their family and render unserviceable*, and discard them. This step must be photo documented. Because these articles of clothing and toys have the potential to be heavily contaminated with COC they are not to have the potential to be reused. Please remember the old saying: "One man's trash is another man's treasure."
- Where practicable, carefully segregate any hypodermic needles or other sharps. A container made of puncture resistant plastic is recommended here.
- Since removal and replacement of appliances is not anticipated, wash and clean all appliances thoroughly.
- Particular interest should be taken for both cleaning and testing on surfaces that tend to collect dust such as range hoods, ceiling fans, windowsills, etc.
- Where appropriate, test pH with pH paper strips (pH range of 6 to 8 is acceptable), use spray starch (iodine indicator) or photo-ionization detector (VOC) to target areas of potential concern.
- After completion of cleanup, acquire confirmatory samples to determine if site meets Standard of Cleanliness.
- Prepare documentation and certify that property is 'Safe for Human Use' The documentation package shall include all reports noted in "*Documentation Requirements:*"
- In cases where police have found a methamphetamine lab but preliminary samples come back as non-detect (with appropriate detection limits), the structure should still be given at least a Tier 1 cleanup response to address probable contaminants other than methamphetamine before release.

* - Render unserviceable - TDEC views this term to mean that items must be destroyed to such a degree that it can no longer be used for its intended purpose. For example: toys or clothing must be cut or broken into pieces. Appliances must be cut in half or otherwise damaged beyond repair. Prior to rendering refrigeration units unserviceable, Freon must be removed by a licensed technician. Carpet must be cut into small pieces. Contact TN Division of Air Pollution Control for guidance before burning anything.

Tier 2 Response - (Motel/Hotel 'transient-cook' scenario with moderate activity or red phosphorous methods.)
Crime scene evidence suggests that a limited amount of methamphetamine, reagents, or precursors were produced over a relative short period of time, a week or so. One or two 'Red-P' or 3 to 4 'Nazi' low-yield 'cooks'. Spills and stains may be observed. An example of when this Tier designation would be appropriate would be where a guest(s) in a hotel, motel, State and Federal park cabin, or in a relatives' / friends' residence stayed less than 2 weeks.

At a minimum a typical cleanup would involve the following:

- If suspicious items (containers with residues, tubing, kitty litter or paraphernalia) are discovered that are apparently related to methamphetamine production, contact law enforcement immediately. If law enforcement personnel do not remove them, these items should be removed by a hazardous materials specialist and properly disposed. Also, law enforcement officials will likely be interested in any firearms encountered during cleanup. Call law enforcement for advice before touching firearms.
- Where applicable/appropriate, follow all cleaning procedures described in Tier 1.
- This Tier differs from Tier 1 Responses in that additional affected fixtures and materials may need to be removed, rendered unserviceable, and disposed of appropriately.
- Alternatively heat and ventilate property for a minimum of 8 days, or until non-detects are achieved via air monitoring. Remember to remove all potential VOC sources on the property.
- Trained technicians shall perform removals, render items unserviceable, and dispose of items appropriately.
- If appliances and fixtures are stained and contaminated to the point that successful cleaning is in doubt, then render appliances and fixtures unserviceable and remove.
- Absorbent surfaces (e.g. drop ceilings surrounding and proximal to 'cook', mattresses, pillows, carpets, and clothing) shall be rendered unserviceable and removed.
- All potential process-related stained surfaces and items shall be rendered unserviceable and removed.
- Where appropriate, the removed items are to be documented and manifested to Special Waste landfill facilities.
- All non-stained hard surfaced are to be washed with appropriate cleaners.
- Where appropriate, all washed hard surfaces are to be painted or sealed.
- All other absorbent surfaces (e.g. – linens, drapes) are to be commercially cleaned twice.
- Cloth furniture is to be commercially steam cleaned twice.
- Replace air filters in HVAC, and commercially clean ventilation duct works.
- After completion of cleanup, acquire confirmatory samples to determine if site meets Standard of Cleanliness.

Tier 3 Response - (Rental or Residential Property 'entrenched cook' scenario.)
Crime scene evidence suggests that numerous Red-P and/or Nazi 'cooks', or precursors and reagent production have occurred periodically over an extended period of time, many weeks to several months. Chemical spills, staining, and burn pits are often observed at these locations. An example of when this Tier designation would be appropriate would be homes and rental property where owners or tenants manufacture methamphetamine periodically. This tier designation should be considered the default Tier designation for homes and rental property with re-occurring 'cooks'. This Tier designation may also be appropriate for hotels / motels with a history of multiple or re-occurring clandestine methamphetamine lab seizures.

At a minimum a typical cleanup would involve the following:

- If suspicious items (containers with residues, tubing, kitty litter or paraphernalia) are discovered that are apparently related to methamphetamine production, contact law enforcement immediately. If law enforcement personnel do not remove them, these items should be removed by a hazardous materials specialist and properly disposed. Also, law enforcement officials will likely be interested in any firearms encountered during cleanup. Call law enforcement for advice before touching firearms.
- Where applicable, follow all cleaning responses in Tier 1 and 2. (Be advised that contact with residual hazardous substances or waste is possible.)
- Alternatively heat and ventilate property for a minimum of 2 weeks, or until non-detects are achieved via air monitoring. Remember to remove all potential VOC sources on the property.
- Remove all porous and absorbent materials and render unserviceable.
- Remove all stained materials and render unserviceable.
- Remove all affected appliances and fixtures and render unserviceable.

- If there is a septic system, sample for methamphetamine by-products (volatile organics). If present, pump septic system and dispose of septage at a treatment works or hazardous waste facility as concentrations warrant (See Appendix C: Lessons Learned).
- Clean or remove grossly contaminated sub-floor or other framing materials prior to reconstruction. **Do not remove any structural members of the building that would compromise structural integrity.** In such cases, clean as well as possible.
- All surfaces, not replaced, must meet Standard of Cleanliness after cleanup.
- Removed items are to be documented and manifested to Special Waste facilities.
- If hazardous waste is present, then it must be manifested to Hazardous Waste facilities.

Tier 4 Response – (The ‘mass-production cook /drugs-for-profit’ lab scenario.)

Crime scene evidence suggests that this lab is capable of producing large quantities (multiple pounds) of methamphetamine, reagents, or precursors during a manufacturing event. Examples of when this Tier designation is appropriate would be homes, rental properties, commercial buildings, and/or farms where large capacity methamphetamine labs or supporting precursor / reagent labs are located. A principle-determining factor for this tier selection is evidence of potentially severe environmental effects because of large quantities of drummed and / or buried waste discovered on the property. Law enforcement agencies must consult with TDEC prior to making this Cleanup Tier Recommendation.

At a minimum a typical cleanup would involve the following:

Please note that prior to any cleanup response for a Tier 4 scenario, when it is determined that hazardous substances or waste are present in such quantities that a regulatory oversight may be required under TDEC Hazardous Waste Rules, coordination with TDEC for the appropriate oversight of hazardous waste characterization, disposal, and cleanup activities is necessary prior to any cleanup response. TDEC does not foresee Tier 4 Responses being very common, but recognizes that the possibility exists.

XI. How to get started with a RAP Response:

1. **When should the RAP response for quarantined properties begin?** When the criminal investigation authorities have decided that the crime scene is no longer necessary for evidence collection, and approval to enter the quarantined property has been secured in writing from the designated CLEO by the property owner.
2. Property owners should contact a Cleanup Contractor within 60 days of the property being released for cleanup.
3. The Cleanup Contractor shall secure as much information as possible from law enforcement. (Law Enforcement / First Responder Crime Scene Report).
4. After reviewing the information from law enforcement, the Cleanup contractor will inspect the quarantined property, assess all potential hazards and assign the appropriate Tiered RAP Cleanup Response (if the Tier is not assigned by law enforcement) to the quarantined property. Justification for the Tier assignment must be supplied.
5. The Cleanup Contractor will develop an appropriate Scope of Work (SOW) for cleanup activities based on the Tier Response. During this step appropriate PPE for the protection of the cleanup workers will be assigned. This step is very important because it is the cleanup workers that will have the greatest potential to be exposed to PTW and COC at these properties.
6. The Cleanup Contractor shall verify and document that all cleanup work was performed according to the SOW. If removal and disposal of contaminated media requiring Special Waste or Hazardous Waste manifesting is necessary, then this activity must be approved by the appropriate regulatory agency, and documented in a Transportation and Disposal Plan.

XII. Disposal of Methamphetamine Wastes

Demolition wastes from methamphetamine sites such as carpets, furniture, trash and other items should be hauled to a Class 1 Landfill. A list is available on the TDEC Methamphetamine Cleanup website along with a copy of the Blanket Special Waste Approval for such CML wastes.

<http://www.state.tn.us/environment/dor/pdf/BlanketWasteApproval.pdf>

XIII. Open Burning

CML wastes should not be burned. Burning releases toxic substances into the atmosphere. Tennessee has a general prohibition against open burning (see Air Pollution Control regulations 1200-3-4). The open burning of wastes from a CML property is prohibited under this rule. The open burning of such wastes could result in a substantial fine or other penalty. <http://tennessee.gov/environment/apc>

XIV. Documentation Requirements

1. After the cleanup response is completed, the Cleanup Contractor or CML Hygienist shall submit a written report along with before-and-after photo documentation of all cleanup activities. This report will also include the SOW for the appropriate Tier Designation along with the justification why this response was chosen, any information from law enforcement, site sketches, photos, and manifests, etc. In addition, if a removal activity occurred during the cleanup response the Transportation and Disposal Plan must be included. Be advised, when it comes to the defensibility of any documentation package of this type, photograph and document the activities adequately.
2. In addition to the above report and supporting documentation, the CML Hygienist or CIH shall submit a Certificate of Fitness certifying that the quarantined property has been cleaned up and that all risks and hazards resulting from criminal methamphetamine production have been abated, and that the property is 'Safe for Human Use' with respect to the methamphetamine laboratory contaminants. This letter is to be attached to the front of the document package and must be prepared by a certified industrial hygienist or TDEC certified CML Hygienist.
3. The property owners are to keep a certified copy of this documentation for a minimum of 5 years or for future property transfers.

Appendix A. Chemicals and Hazards associated with Methamphetamine Production.

Typical Chemicals Found in Lab Sites	Common Legitimate Uses	Poison	Flammable	Toxic Vapors	Explosive	Corrosive	Skin Absorption	Common Health Hazards
Acetone	Fingernail polish remover, solvents	X	X	X			X	Reproductive Disorders
Methanol	Brake cleaner fluid, fuel	X	X	X			X	Blindness, eye damage
Ammonia	Disinfectants	X		X		X	X	Blistering, lung damage
Benzene	Dye, varnishes, lacquers	X	X	X	X	X	X	Carcinogen, Leukemia
Ether	Starters fluid, anesthetic	X	X		X			Respiratory
Freon	Refrigerant, propellants	X		X		X		Frostbite, Lung damage
Hydriodic Acid	Driveway cleaner	X		X		X	X	Burns, Thyroid damage
Hydrochloric Acid (Hcl gas)	Iron ore processing, mining	X		X		X	X	Respiratory, Liver damage
Iodine Crystals	Antiseptic, Catalyst	X	X		X	X		Birth defects, Kidney failure

Appendix E

Appendix A. (Continued)

Chemicals and Hazards associated with Methamphetamine Production.

Typical Chemicals Found in Lab Sites	Common Legitimate Uses	Poison	Flammable	Toxic Vapors	Explosive	Corrosive	Skin Absorption	Common Health Hazards
Lithium Metal	Lithium batteries	X				X	X	Burns, Pulmonary edema
Muriatic Acid	Swimming pool cleaners	X		X		X		Burns Toxic vapors
Phosphine Gas	Pesticides	X		X			X	Respiratory failure
Pseudophedrine	Cold medicines	X						Abuse: Health damage
Red Phosphorus	Matches, fireworks	X	X	X	X			Unstable, flammable
Sodium Hydroxide	Drain cleaners, lye	X		X		X	X	Burns, skin ulcers
Sulfuric Acid	Battery acid	X		X		X	X	Burns, thyroid damage
Toluene	Paint thinners, solvents	X	X	X	X		X	Fetal damage, pneumonia
Liquid Lab Waste	None	X	X	X	X	X	X	Unknown long term effects

This information was obtained from the Division of Environmental Health, Office of Environmental Health and Safety, Washington State. <http://www.doh.wa.gov/ehp/ts/CDL/methhazards.htm>

Appendix B: TDEC Cleanup Response Tier Selection Criteria

(This is the decision tree law enforcement officials use to recommend a cleanup tier.)

The recommended TDEC Cleanup Response Tier for a property is based on probable or documented criminal activity as noted in the EPIC Report and from crime scene information available to law enforcement officers. It should be noted that subsequent assessments and testing of a quarantined property by a TDEC Certified CML Cleanup Contractor, CML Hygienist, or a Certified Industrial Hygienist may result in a finding that an alternate cleanup response Tier be more appropriate. The cleanup contractor must document any variance from the initial recommended Tier Recommendation and the hygienist of record must concur.

Is this property eligible for quarantine?

Is there evidence of the manufacture of methamphetamine?*

Yes: Go to Tier 1 - Selection criteria

No: STOP, DO NOT Quarantine this property.

Note: P2P/Methylamine and / or reagent labs default to Tier 3 Recommendation.

Tier 1 - Selection criteria: (Most applicable to locations where the criminal does not reside or work.)

- 1) Is lab capacity greater than 2 ounces per manufacturing event?
 - Unknown: Go to Tier 2 - Selection Criteria
 - Yes: Go to Tier 3 - Selection Criteria
 - No: Continue with next Tier 1 questions.
- 2) Did suspects likely manufacture methamphetamine, its reagents, or precursors for more than 3 days but less than two weeks at this location?
 - Unknown: Go to Tier 3 - Selection Criteria
 - Yes: Go to Tier 2 - Selection Criteria
 - No: Continue with next Tier 1 question.
- 3) Are the chemicals found consistent with a phosphorous/iodine (Red-P, Hypophosphoric, Hydroiodic) type methamphetamine or reagent lab?
 - Unknown: Go to Tier 3 - Selection Criteria
 - Yes: Go to Tier 2 - Selection Criteria
 - No: STOP - A Tier 1 Cleanup Response is recommended for this property.

Tier 2 - Selection criteria: (Most applicable to locations where the criminal does not reside or work.)

- 4) Is lab capacity greater than 2 ounces per manufacturing event?
 - Unknown: Go to Tier 3 - Selection Criteria
 - Yes: Go to Tier 3 - Selection Criteria
 - No: Continue with next Tier 2 questions.
- 5) Did suspects likely manufacture more than two weeks at this location?
 - Unknown: Go to Tier 3 - Selection Criteria
 - Yes: Go to Tier 3 - Selection Criteria
 - No: STOP - A Tier 2 Cleanup Response is recommended for this property.

Tier 3 - Selection criteria: (Most common to locations where criminal resides or works.)

- 6) Is lab capacity greater than 1 pound per manufacturing event?
 - Unknown: Go to Tier 4 - Selection Criteria
 - Yes: Go to Tier 4 - Selection Criteria
 - No: STOP - A Tier 3 Cleanup Response is recommended for this property.

Tier 4: Selection criteria: (Potential for severe environmental effects.)

Law enforcement agencies must consult with TDEC officials prior to making this Cleanup Response Tier recommendation. Pursuant to T.C.A. 68-212-Part 5, TDEC - Division of Remediation is tasked with regulatory responsibilities for cleanups at clandestine methamphetamine labs. Please contact the Division of Remediation Central Office at (615) 532-0900 for assistance for this tier recommendation. TDEC-DoR business hours are typically Monday through Friday 8:00 to 4:30 Central time.

* Be advised that the presence of residues methamphetamine on surfaces alone is not sufficient evidence to prove that the manufacture of methamphetamine occurred. It must be in combination with other lab items or paraphernalia. Evidence of manufacture of methamphetamine can be as simple as the presence of ground tablets, consolidated containers of tincture of iodine, phosphorus stained coffee filters, or non-neutral pH (<6 or >8) present on walls and furniture. These items will, of course, be components of a weight of evidence that manufacturing has occurred. A lab seizure is sufficient evidence to quarantine property.

Appendix C: Lessons Learned

1. Flexible duct

Flexible ductwork in most cases cannot be economically cleaned. This type of ductwork has a tendency to roll with the turning motion of a cleaning brush. It frequently has a porous inner surface. Water injected into such an environment as inside flexible ductwork would likely lead to mold growth and other problems. In most cases it is recommended that this type of ductwork be removed and replaced with new ductwork once cleaning is sufficiently complete.

2. Paneling

In most cases, wood paneling should be considered an absorbent material.

3. Cleaning the Floor First and Last

The floor of a property affected by methamphetamine production can have heavy concentrations of methamphetamine. Household dust collects methamphetamine residues and deposits them onto the floor as the dust settles out of the air. It has been the experience of some that a ceiling to floor cleaning can give poor results because of recontamination from the floor in the final phase of cleanup. A preliminary washing of the floors can cut the heavy concentrations and reduce the amount of chemicals available to re-contaminate surfaces as the floor is cleaned on the final wash. The cleaning of ceilings and walls working downward would, of course, follow the initial floor cleaning and the floor would be cleaned again as each room is completed and exited.

4. Never dry vacuum.

Dry vacuuming should be avoided at methamphetamine-contaminated sites. Dust particles pulled from surfaces can frequently pass through the vacuum and be redistributed throughout the structure. When these redistributed particles settle, they can re-contaminate cleaned surfaces. Ductwork vacuums should be vented to the outside air when possible.

5. Septic tanks

Septic tanks are frequently used to dispose of waste liquids from methamphetamine production. However, when a septic system is heavily used to dispose methamphetamine wastes, problems with pH, sludge buildup, and bacterial die-off can occur. TDEC recommends that septic systems where methamphetamine waste disposal has occurred regularly (heavy Tier 3 or greater) be tested (Toxicity Characteristic Leaching Procedure - TCLP) and pumped. It is important to remember that testing results should be known **BEFORE the tank is pumped**. If characteristics of the septage are such that it cannot be disposed at a local treatment works, other disposal plans must be made.

Fortunately, a septic tank is an efficient bioreactor capable of handling many of the chemicals involved in the illicit manufacture of methamphetamine. Acids and bases are attenuated or neutralized. Solvents are adsorbed to carbon solids and slowly broken down. Liquid wastes from septic tanks would only be considered hazardous if they were to exhibit characteristics of hazardous waste or contained listed waste. Septage with very high or very low pH or a very high concentration of a solvent with a toxicity characteristic such as benzene would be quite rare. It is even more unlikely that the liquid would exhibit the characteristics of ignitability or reactivity. Because the waste determination would be based on the entire contents of the tank, it is unlikely that the contents would exhibit a hazardous waste characteristic if the volume of methamphetamine waste in the tank were small in comparison to the volume of common household waste.

Be aware of the regulations concerning the transport and disposal of hazardous waste. Contact TDEC Division of Solid Waste Management or the Tennessee Department of Safety if you are unsure of how to proceed. Remember that tying up septic hauler truck until samples are analyzed and disposal decisions are made could be a very expensive proposition.

6. Contamination Mass Reduction

The least contaminated areas of a structure should usually be cleaned first. This limits the amount of contamination carried by workers as they go to different areas. Once cleaned, rooms can be roped off with tape or otherwise marked so that workers do not inadvertently spread contaminants back into cleaned rooms.

7. Encapsulation

One strategy for reducing methamphetamine concentrations on surfaces is to coat them with an encapsulating paint. However, painting does not encapsulate heavy concentrations of methamphetamine. Methamphetamine vapors can slowly

volatilize through the paint. Painting should only be done after surfaces have been washed at least twice. We feel the contaminant mass reduction of two washes should prevent significant risk of seeping through the paint. Any concerns about heavy concentrations inside walls or in attic spaces that could potentially re-contaminate the living space of the dwelling should be addressed before this phase of cleanup.

Indications are that oil-based paints and sealers work better than water-based paints and sealers.

8. Documentation Quality

TDEC does not usually give review or comment on methamphetamine cleanup reports. They are entirely the responsibility of the contractor and hygienist.

Care and diligence should be taken in the documentation of a methamphetamine cleanup. A photographic record of removals and cleaning should depict all of the major cleanup actions. These will help the property owner, contractor, hygienist and others if questions are ever raised about a cleanup. Frequently, cleanups are used as evidence that a family has turned their lives around after children have been removed from the home by court order. These cleanup reports will inevitably be scrutinized by the court and caseworkers. Should a contractor or other person be called into court to testify about cleanup issues, a high quality and detailed cleanup report will be invaluable.

While this guidance is not a point for point regulation, it does represent the best-known strategies for methamphetamine cleanup at a given time. When disputes or questions arise about cleanups, deviations from this guidance should be documented with sound reasoning and logic from the information at hand. If a cleanup report is questioned, it is likely that it will be held against the guidance in a checklist fashion and deviations from it will naturally be questioned heavily.

9. Third party testing

TDEC keeps contact information for hygienists and cleanup contractors in separate lists. The cleanup contractor and hygienist should be hired independent of one another. If a contractor or hygienist hires the counterpart, s/he is likely to hire someone with whom s/he has a close professional relationship. Contractors and hygienists will nearly always work together honestly. However, if they are hired separately there is even less likelihood that they could collude to drive up price or cover a poor cleanup. An independent review also has a better appearance if cleanup issues are later questioned. In either case, both the hygienist and contractor will have to work together and communicate to achieve a proper cleanup.

10. Communication with Law Enforcement

It is always a good idea to call the quarantining officer or his/her narcotics office to inform them when people will be in the quarantined property. No one is allowed in a quarantined property without the supervision of law enforcement or a TDEC certified CML contractor or hygienist.

11. Mobile Homes

Occasionally, when a methamphetamine lab is located in a mobile home that is several years old, the cost of decontamination may outweigh the value of the mobile home. In such cases, with contaminated furnishings removed, the mobile home may be hauled intact to a Class 1 landfill and be demolished at the landfill. Prior arrangements must be made with the landfill. Some landfills will not be able to accommodate on-site demolition. The steel framing at the base of the mobile home should be minimally affected and can be recycled. The recycling process will effectively destroy any residues.

Appendix D. - ACQUIRING SEMI-POROUS SURFACE WIPE SAMPLES

The sample method used to determine whether or not a structure is sufficiently clean of methamphetamine related contaminants is called surface “wipe” sampling. Please note that all hard surfaces in homes or structures (e.g. ceilings, floor tile, walls, counter tops, shelving, appliances, etc.) should be considered semi-porous with respect to methamphetamine contamination. Porous surfaces such as carpet, drapes, most paneling, clothing, etc. cannot be sampled using this method. Good quality, absorbent wipes should be used when collecting methamphetamine wipe samples, especially when wiping rough surfaces. Wipes must be wetted with a wetting agent to enhance collection efficiency. The current approved wetting agent for collection of methamphetamine samples is methanol.

The following sample acquisition procedure is recommended when collecting wipe samples at former CMLs.:

- 1) Prepare a site sketch of the areas to be sampled, along with the rationale why each sample location was chosen. A log of all activities occurring during the sampling event is also important to record. In addition, a photo log of all sample locations and procedures should be recorded. Make sure photo shows sample location inside the room relative to other items for later identification, not just the sample location by itself with no other items around it. This step is critical as it is one of the primary reference documents that could be challenged in court if a property goes through litigation.
- 2) Position a clean, good quality metal or stiff paper 100 cm² template over the area to be sampled. Lightly mark the surface to be sampled at the corners of the template with a pencil. Remove and wipe template with clean dry wipes prior to repositioning it over the next sample location. Use 2” wide painters tape to outline the 100 cm² area on the surface where the pencil marks were made. Use a permanent marker to label the outlined area at the upper right edge of the 2” wide painters tape with the sample location identifier. Good Quality 100 cm² templates are also acceptable.
- 3) Co-locate moistened intermediate range, non-bleeding, color indexed pH indicator strips near sample areas. It is best to place pH strips to the side of sample areas so it does not interfere with wipe tests. Moisten pH strips with neutral de-ionized water. Apply moist pH paper to surface, allow time for reaction (1 minute) and read pH strip while still moist. Make sure all pH strips remain in the neutral color index before placing them on surfaces. The pH test can be a good indicator of where active cooking may have occurred within a structure. Record the pH reading in field book along with sample location ID number. These pH strips will need to have a minimum sensitivity of 0.3 to 0.5, and be able to measure a pH range of from 2 to 9. Note: Do not drown a surface area with water and then place the pH strip in the puddle. This method will over buffer a surface area and yield an inaccurate reading.
- 4) Prior to taking any 100cm² wipe sample, a new set of clean, impervious protective gloves must be worn to prevent / limit the potential for cross-contamination of a sample from previous sample locations. This step also serves to protect the sampler from exposure to contaminants and wetting agents. Take care that gloves are chosen that are chemically compatible with acids and other suspected chemicals.
- 5) After all sample location preparation has been completed, begin wipe sample acquisition. With a cleaned gloved hand, withdraw wipes from package and place on a clean surface. One wipe is used per each 100cm² location. Fold wipe into ¼ size and moisten the wipe with methanol by pouring it onto the wipe. The wipe should not be dripping with methanol, but moistened sufficiently to collect a representative sample. Wring or squeeze out any excess wetting agent. Under and/or over saturating the wipe with the wetting agent, may prevent a true representative sample from being acquired. Practice this technique.
- 6) Firm pressure should be applied when wiping a surface. With a rolling-up wiping motion, start at an outside upper edge and begin wiping around along and down the edge towards the central portion of the surface area. When done correctly this wiping motion allow you to capture almost ½ the surface area in a single pass. Repeat this motion on the un-wiped portion of the sample area. Fold the wipe over to expose clean inner surface and repeat this process once. Remember this is a wipe sample so do not to use a scrubbing motion on the surface area. Remember to remain inside the outlined 100cm² area. A slight overrun of 100cm² area onto painters tape will not affect sample results. Do not under sample the 100cm² area. This technique needs to be practiced before attempting to acquire samples in the field.
- 7) Without allowing the wipe to come into contact with any other surface, place the wipe into the sample container, cap, properly label it with the location number, and note the number of the sample location on the sketch and on

sample container. Place a legal / custody seal on the sample container. Include notes with the sketch giving any further description of the sample. If this is a composite sample, all wipes for that composite sample must be placed into the same sample container prior to placing legal seal onto container.

- 8) At least one field blank wipe, moistened with solvent, but without wiping, should be submitted for every twenty samples for quality control purposes. Do not note that sample is a field blank on lab submittal sheet.
- 9) Complete chain of custody forms, lab sheets, and field notebook. Pack cooler with sufficient ice to maintain 32°F during shipment. Two large sealable poly bags are sufficient to keep samples cool during transport in small coolers. Double bag ice to prevent leakage during shipment. Sample containers should be wrapped in bubble wrap to prevent breakage during transport. Use bubble wrap or packing peanuts to fill up empty spaces in cooler. Send samples via an overnight shipper.

Appendix E. - Data Usability

1. Data usability and evaluation.

Testing for methamphetamine and determining whether a property is 'safe for human use' requires the use of hard data and simple statistics. Averages of concentration among composite wipe samples must be calculated and compared to standards. Discreet/grab samples of certain areas are also frequently taken.

2. Discreet/grab samples

Discreet samples are those taken of a single area designated with a template and compared to a standard. In a discreet sample only one wipe is used to sample a single 100cm² area and is then analyzed. The results are reported as the amount collected per 100cm².

Discreet samples should be taken of areas of frequent contact such as switch plates, doors, kitchen or bathroom counters or any surface where people are likely to place hands.

3. Composite samples

Composite samples are taken of several areas designated by 100cm² templates and analyzed together to produce a single result. In a composite sample up to four wipes from four different templates can be analyzed together. Each template must be used only once with a separate wipe and set of gloves for each 100cm² area of the composite. When results are reported they are corrected to the total surface area of the entire composite.

As an example, if a room is small then one composite sample may suffice to determine the cleanliness of that room. Four 100-cm² templates could be placed on the walls and floor of the room. Individual wipes for each template would be taken and placed into the same sample container. The lab would extract the methamphetamine from all wipes and report the total extracted. If the lab reported a total 0.2 ug extracted from the four wipes, the corrected result for four 100cm² templates would be 0.05 ug/100cm², a passing result. That room could be considered cleaned. If however, the result was greater than 0.1 ug/100cm², the room would have to be cleaned again.

4. A representative sample

How many samples do I need to adequately address a residence? This is one of the most important questions for a hygienist to answer. A small room (12' x 12') may need only one four-point composite sample. A larger room (14' x 25') may need three four-point composites. Each room usually needs testing. Discreet samples should be taken of anything that seems to have a high probability of contact (i.e. eating areas, food storage areas, or any other area to which people are drawn or exposure is likely)

5. Detection limits

Detection limits should be documented by the analytical lab and provided along with the results. A result of "non-detect" is not acceptable proof of a successful cleanup if detection limits are greater than the standards for cleanup.

6. Calibration

Photo-ionization detectors (PIDs) and other analytical or screening equipment need periodic calibration. This should be done according the manufacturer's specifications and reported along with any results obtained from that equipment. The expiration dates of any calibration standards such as span gas should be reported as well.

7. Background

In some areas, especially near industrial facilities, there may be a baseline or background of VOC that is greater than the 1 ppm standard. In such areas, document outside air conditions with a properly calibrated instrument. Document areas of the structure being tested where readings for VOC are highest and lowest and what those readings are. Clean any areas that appear to be above background. When household VOC is within 1 ppm of background, the structure is considered cleaned to standard.

Remember also that gasoline and power equipment as well as adhesives, paint, dry-cleaned clothing, 0solvents and other volatile household chemicals should be removed a considerable time before this evaluation because of the probability of them contributing to background VOC.

8. Results vs. Standards

If the concentration of methamphetamine from the wipe samples is less than $0.1 \text{ ug}/100\text{cm}^2$, the standard has been met. If a particular room has a corrected composite sample that is greater than $0.1 \text{ ug}/100\text{cm}^2$, that room will need to be cleaned and retested without testing the rest of the building.

In a composite sample the concentration must be corrected for the surface area of the wipe samples. If a composite sample consists of three wipes taken from three 100cm^2 templates and the result is a total of 0.6 ug of methamphetamine, then the result is $0.2 \text{ ug}/100\text{cm}^2$. Be sure that the analytical lab results are clear, and this point is not confused to accidentally report a sample too high or too low.

9. Chain of Custody and Sample Preservation

Chain of custody, sample temperature, and shipping information are important pieces of documentation. They show that samples were shipped with care and that the proper holding temperatures were maintained during shipment. Results of samples collected without this information become suspect.

Appendix E

**PROCEDURES FOR THE ASSESSMENT AND
REMEDICATION OF CLANDESTINE
METHAMPHETAMINE LABORATORIES**

**Solano County
Department of Resource Management
Environmental Health Services Division**

Hazardous Materials Section
675 Texas Street, Suite 5500
Fairfield, California 94533

JANUARY 2006

**PROCEDURES FOR THE ASSESSMENT AND REMEDIATION
OF CLANDESTINE METHAMPHETAMINE LABORATORIES**

**COUNTY OF SOLANO
DEPARTMENT OF RESOURCE MANAGEMENT**

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1.0. PURPOSE AND AUTHORITY

This document has been developed pursuant to the requirement specified in California Health and Safety Code, Division 20, Chapter 6.91, Section 25400.35 to provide uniform procedures for the assessment and remediation of clandestine methamphetamine manufacturing sites. Drug labs other than methamphetamine production are rarely found in this area, this document is purposely limited to methamphetamine. This document is to be used by Property Owners and remediation consultants and contractors to develop and implement an appropriate remediation strategy, and by Solano County to evaluate Work Plans and assessments in a manner consistent with state law and best available practices.

Pursuant to California Health and Safety Code, Division, 20, Chapter 6.91, Section 25400.17(b) the Solano County Health Officer has delegated authority for the regulatory oversight of these contaminated properties through a formal Memorandum of Understanding to Solano County Department of Resource Management. This document communicates the expectations of the Solano County Department of Resource Management (SCDRM) relative to the standard of care that is to be used in assessment and remediation work. Pursuant to the California Health and Safety Code pre- and post-remediation assessments are to be conducted by and Work Plans developed initially by Certified Industrial Hygienist, and if soil and groundwater investigation is necessary a Registered Professional Engineer or Professional Geologist. Remediation tasks are to be conducted by a licensed Hazardous Materials Contractor.

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2.0. INTRODUCTION

Law enforcement personnel discover and seize Clandestine Methamphetamine Laboratories (Clan Labs) that illegally manufacture methamphetamine in Solano County. While law enforcement

personnel arrange for the removal of chemicals and process equipment for evidence, the Property Owner is left to clean up the property, which may be highly contaminated with both precursor chemicals and the final drug product. If law enforcement advises SCDRM personnel that a methamphetamine laboratory was seized on a property, then pursuant to California Health and Safety Code, Division 20, Chapter 6.91 the property is presumed to be contaminated and is found “unfit for occupancy” until demonstrated otherwise by a site assessment. The owner is responsible for assessing the level of contamination and cleaning up (decontaminating) the property. An effective remediation process requires coordination and cooperation between the Property Owner, the Property Owner’s environmental consultant and remediation contractor, local code enforcement personnel, city/ county building officials, and SCDRM. SCDRM’s role is to provide regulatory oversight on the public health and chemical contamination issues associated with Clan Labs

This document provides information necessary for planning and implementing an effective site assessment and remediation process. This information represents best practices in Clan Lab remediation as described in documents promulgated by a variety of State and Federal agencies and meets the requirements of Chapter 6.91 of the California Health and Safety Code. The practices described herein represent state law and best management practices in environmental health and industrial hygiene. SCDRM’s role is regulatory oversight to verify that processes reflect practices required by California Health and Safety Code and, of greatest importance, protective of public health.

It is noted that this document borrows a significant amount of information from “Criteria For the Assessment and Remediation of Clandestine Methamphetamine Laboratories” developed by Sacramento County and “Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites,” developed by the Washington State Department of Health (WDOH), Office of Toxic Substances, as well as other resources listed in Attachment III.

In using this document, Property Owners and their consultants must be mindful of the variation among both Clan Labs and the processing methods. The primary method used for the illegal manufacture of methamphetamine in Solano County is the Red Phosphorus Method; however other methods may come in use. The health and physical hazards between manufacturing methods vary significantly, and assessment and remediation methods will similarly vary.

3.0. REMEDIATION PROCESS

3.1. WHY REMEDIATION IS NECESSARY

Properties used as Clandestine Methamphetamine Labs will typically be found with a lab-like setting, including containers of chemicals and manufacturing equipment. While this material will be removed by the California Department of Toxic Substances Control (DTSC) contractor, SCDRM experience and California Health and Safety Code states that, until proven otherwise, contamination from the drug manufacturing process is presumed to be present. Typical areas of contamination include sinks, toilets, bathtubs, floor, walls, ceilings, carpets, drapes, furniture and ventilation (heating and air conditioning) systems.

The potential health effects from long term exposure to low levels of the chemicals used and produced in the Clan Lab processes remain under study. However, California Health and Safety Code, Division 20, Chapter 6.91 specifies human occupancy standards for properties where Clan Lab activity occurred

which will remain in effect until DTSC adopts statewide health based targeted remediation standards for methamphetamine.

3.2. WHAT ARE THE CONTAMINANTS OF CONCERN?

Each type of methamphetamine manufacturing process involves chemicals specific to the process. As previously noted, the Red Phosphorus Method is the most common method found in Solano County however other methods could be encountered. Information regarding process-specific chemicals is provided in Attachment II.

3.3. WHO DOES THE WORK?

While SCDRM Hazardous Material Specialists respond to Clan Lab scenes, post the properties with warning notices, conduct inspections to observe initial conditions, and write a clandestine drug lab order(s), they do not conduct formal site assessments.

It is critical to have site assessment and remediation work directed by skilled, experienced professionals. Pursuant to California Health and Safety Code Chapter 6.91 and the California Business and Professions Code tasks such as preliminary assessments, Work Plan development, and post-remediation assessments shall be conducted by a Certified Industrial Hygienist (CIH), and when applicable Registered Professional Engineer (PE) and/or Registered Professional Geologist. In this document, these professionals will be referred to as **“the Consultant.”** All documents produced in association with the site remediation shall be stamped with the seal of the CIH and when applicable PE and/or PG who is directing the work.

The approved remediation plan shall be implemented by a licensed contractor holding the Hazardous Substance Removal Certification (HAZ), as issued by the Contractors State License Board. Additionally, if asbestos or lead is suspected to be present or is encountered the contractor or subcontractors shall have all the necessary State Asbestos and Lead certifications. In this Document, the remediation contractor will be referred to as **“the Contractor.”** **All personnel working on the remediation must meet the training and medical surveillance requirements of the Cal/OSHA Hazardous Waste Operations and Emergency Response Standard, Title 8, California Code of Regulations, Section 5192** and all applicable asbestos and lead training as specified in state laws and regulations.

SCDRM personnel provide regulatory oversight and approval of Preliminary Site Assessment Work Plans. SCDRM personnel do not direct the work of the Property Owner’s consultants. SCDRM will provide applicable information regarding the Clan Lab. However, consultants are expected to utilize their professional expertise in preparing the Work Plans described below.

3.4. PROPERTY USE

The property that housed the Clan Lab shall be posted by the SCDRM Hazardous Materials Specialist responding to the scene to prohibit occupancy. In so doing, SCDRM is acting as an authorized agent of the Solano County Health Officer pursuant to California Health and Safety Code. The posted property is unfit for occupancy under the California Health and Safety Code, and the SCDRM will place a lien on the property title. Entry into the property is prohibited until such time that a SCDRM representative authorizes entry. **No personal belongings, furniture, or other items shall be removed from the**

posted property until released by the SCDRM Hazardous Material Specialist. Such release is not likely to occur until the Preliminary Site Assessment (see below) has been completed.

If a Clan Lab is discovered in a residence, apartment unit, hotel room or similar premises, entrance to the entire unit will be prohibited. The SCDRM Hazardous Materials Specialist will not post only one room where the cooking occurred (e.g., bedroom, kitchen) within the premises; experience has indicated that contamination is rarely limited to the specific area of the cooking process. Additionally depending upon the apparent extent of contamination, the SCDRM Hazardous Material Specialist may post adjacent units of apartments, hotels, and other proximal building units. However, depending on location and impact of the Clan Lab operations, outbuildings (i.e. sheds and garages) may be posted without impacting the residence if appropriate.

3.5. PRELIMINARY SITE ASSESSMENT (PSA)

Pursuant to the California Health and Safety Code the operating assumption is that the illicit drug manufacturing process (cooking) has lead to some level of chemical contamination, at a minimum in the immediate area around the cooking area. The goal of the PSA is to determine the level and extent of contamination in order that an effective Remediation Work Plan can be developed.

In the case of surfaces that are obviously or highly suspected to be contaminated, SCDRM will waive sampling requirements for those items or materials that will be removed and properly disposed (see Section 7.0). Prior to disposal of the contaminated materials, the consultant/contractor shall ensure that the acceptable disposal facility has received their requested laboratory analysis and agrees to accept the material.

If cooking was conducted in a kitchen and staining is evident, the Property Owner may decide that it is more cost-effective to remove and dispose sheet rock, cabinets, appliances and linoleum rather than to spend money on sampling to confirm that the materials are contaminated. Or it may be decided to surface wash (Section 3.8.4) and encapsulate (Section 3.8.5) all surfaces in a room that appear to have been impacted; assessment sampling would not be required for these surfaces, but post-remediation sampling must be done. Such plans should be disclosed in the PSA Work Plan (see below).

3.5.1. PSA WORK-PLAN

A written PSA Work Plan must be developed by the Consultant and submitted to SCDRM for approval. **The PSA shall not commence until SCDRM has reviewed and approved the PSA Work Plan. The Property Owner shall retain a consultant/contractor within 30 days after receipt of the SCDRM's written order notifying the Property Owner of the presence of a Clan Lab and evidence of contamination. The PSA Work Plan shall be submitted to SCDRM for review within 30 calendar days of the Property Owner retaining a consultant and/or contractor.**

The PSA Work Plan shall include:

1. The physical location of the property.
2. A summary of the information obtained from law enforcement, SCDRM, Code Enforcement, building departments, and other knowledgeable sources. The summary will include a discussion of the information's relevance to the contamination, including areas suspected of being contaminated. Relevant information would include (as available):
 - Duration of lab operation and number of batches cooked or processed.
 - Drugs known to have been manufactured.

- Recipes and methods used.
- Chemicals and equipment found (by location).
- Location of contaminated cooking and/or storage areas.
- Visual assessment of the severity of contamination inside and outside of the structure where the lab was located.
- Assessment of contamination of adjacent rooms, units, apartments or structures.
- Disposal methods observed at or near the site (e.g., dumping, burning, burial, venting, and/or drain disposal).
- Compare chemicals on the manifest with known methods of manufacture in order to identify other potential contaminants (see Attachment II).
- Determine whether the drug manufacturing method included the use of chemicals containing mercury or lead (e.g., lead acetate, mercuric chloride, mercuric nitrate). If these contaminants are found, remediation protocols will deviate from the generic remediation guidelines, and remediation planning and remediation will be more stringent.

SCDRM will make reasonable attempts to obtain and provide relevant documents from law enforcement, Code Enforcement, and environmental agencies. However, SCDRM does not have the authority to compel the timely release of this information, and not every request will be successful.

3. A description of the areas to be sampled and the basis for the selection of the areas. This section should also document the decision process used in determining **not** to sample particular areas. Consideration should be given to:
 - Obviously stained areas.
 - Immediate cooking area(s).
 - Areas where chemicals were found.
 - Adjacent rooms.
 - Locations typically accessible for contact by occupants, particularly children.
 - High traffic areas outside of the cooking area.
 - Ventilation systems.
 - Hard and soft surfaces, walls, floors, ceilings, appliances.
 - Areas of potential waste disposal, such as sinks, floor drains, bathtubs, showers, and toilets.
 - Septic systems, if present. (see section on Septic Tanks)

Potential areas of contamination can be divided into primary and secondary areas.

Typical primary areas would include:

- Processing or “cooking” areas. Contamination in these areas may be caused by spills, boil-over, fires, explosions, or by chemical fumes and gases created during cooking. Areas affected may include floors, walls, ceilings, glassware, containers, working surfaces, furniture, carpeting, draperies and other textile products, plumbing fixtures and drains, heating and air conditioning vents.
- Disposal areas. Indoor areas include sinks, toilets, bathtubs, plumbing traps and floor drains, vents, vent fans, and chimney flues. Outdoor contamination may be caused by dumping or burning on or near soil, surface water, groundwater, sewer or storm systems, septic systems, and cesspools.
- Storage areas. Contamination may be caused by spills, leaks or open containers.

Secondary areas of contamination may include:

- Locations where contamination may have migrated, such as hallways or high-traffic areas.
 - Common areas in multiple dwellings, and adjacent apartments or rooms, including floors, walls, ceilings, furniture, carpeting, light fixtures, blinds, draperies and other textile products.
 - Common ventilation or plumbing systems in hotels and multiple dwellings.
4. Sampling protocols (see Section 3.6); analytical methods (see Section 5.0), laboratories to be used and their relevant certifications/accreditations (see Section 6.0). During each phase of sample collection, identical methods must be used to provide a basis for comparing results.
 5. A description of areas and items that will be remediated in lieu of sampling, if any (see Section 3.5).
 6. Estimated time of submittal of the PSA results and report to SCDRM.

3.5.2. PSA REPORT

If the PSA determines that there are levels of contamination at the site that warrant remediation as required by this document, a PSA Report shall be prepared and submitted to SCDRM. If results suggest that no further action be taken, the PSA Report shall be prepared in accordance with Section 3.5.3.

Components of the PSA Report shall include:

1. Location – Street address and mailing address of the contaminated property, owner of record and his/her mailing address, legal description, and clear directions for locating the property.
2. Site map – A diagram of the contaminated property, including floor plans of affected buildings, local drinking water wells and nearby streams (if potentially impacted) drawn to a scale of 1/4” to 1’ unless otherwise directed by the SCDRM Hazardous Materials Specialist. The diagram shall show the location of damage and contamination and the location of sampling points used in the PSA; the sampling point locations shall be keyed to the sampling results and remediation recommendations.
3. A description of the sampling methods and analytical protocols used in the assessment.
4. A description of the sampling results. If providing a narrative, group results by location rather than by analyte.
5. Information regarding the background samples and results obtained (see Section 5.0).
6. Specific recommendations, including methods, for remedial actions required to meet State of California Re-occupancy standards (see Section 4.0).
7. A plan for the Post Remediation Site Assessment, including specific sampling requirements and methodologies, and locations at which samples are to be obtained.
8. The report shall be signed and stamped by the CIH and when applicable a PE and/or PG preparing the report.

The PSA report must be thorough and specific in reporting findings and recommendations. If areas or items are contaminated, the report must be specific enough that the cleanup Contractor doesn’t have to guess at the action required. Therefore, a recommendation such as “the stove and all adjacent impacted areas must be cleaned” is insufficient, for it begs the question of what constitutes an “adjacent

impacted area.” It is incumbent upon the Consultant to design the PSA sampling program to provide sufficient data to make specific, rather than vague, recommendations.

3.5.3. PSA SUGGESTS “CLEAN” SITE

While experience indicates that it is unlikely, sample results from the Preliminary Site Assessment may show that the Clan Lab activities did not leave areas of contamination at the property. If this is the case, the Consultant shall prepare a report to SCDRM based on the analytical results, requesting that the property be declared remediated and fit for human occupancy. Property Owners and Consultants are cautioned that until SCDRM reviews and accepts a report, and the Property Owner pays the amount of the lien, no occupancy of the property is to take place. The Consultant shall review Section 3.9, “Remediation Work Plan,” to determine appropriate contents for this report.

3.6. SAMPLING PROTOCOL

SCDRM has reviewed a number of sampling methods from a variety of sources, and has determined that a standard method based on the “Proposed Surrogate Method” devised by Bruce Lazarus, CIH, will be the benchmark for evaluating sampling protocols. Lazarus’ paper describing this method was published in the Journal of Clandestine Laboratory Investigating Chemists, Volume 10, Number 2, April 2000. A brief review of Lazarus’ perspective, taken from the article, as well as the “Surrogate Method” sampling protocol required by SCDRM is presented in Attachment I.

3.6.1. WIPE SAMPLES AND RESULT REPORTING

Wipe samples are, at best, an imprecise sampling technique for which there is little agreement on the “best” method. It is noted that the literature indicates that wipe samples do not collect anywhere near all of the contaminant from a specific sampling area, and that it takes at least three wipes to collect the majority of the surface contamination. To control variables, the Consultant shall use a consistent wipe sample technique throughout the project, and describe the specific wipe sample process in the reports. The Department expects Consultants to follow the sample collection methodology described in Attachment I.

Recent work by the Washington Department of Ecology suggests that deionized water is not effective in lifting methamphetamine from sampled surfaces. Samples obtained using methanol as a solvent have shown much better recovery. Therefore, all wipe samples shall use methanol as the wetting/collecting solvent. Consultants are cautioned to use appropriate personal protective equipment when using methanol.

SCDRM will not accept sample results for which the area of the sample is not recorded. All wipe sample results shall be reported as weight/surface area, in mass/100cm² (see Section 5.0 for exceptions) A common investigation practice is to take several swipes of unknown and inconsistent surface areas for a composite sample; such practices will not be accepted, even if only to substantiate that contamination exists in a particular area.

Lazarus recommends a one square-foot surface area sample be obtained (see Attachment I). For general wipe sampling, the literature and regulatory agencies require a surface area of either 100 cm² or 1 ft². California Health and Safety Code require a surface sample area of 1 ft² for lead and 100 cm² for methamphetamine, as this is consistent with other regulatory agencies for Clan Lab investigations.

Sample containers shall be glass bottles, as described in Attachment I. The literature suggests that the use of plastic bags presents a greater opportunity for the contaminant to transfer from the wipe to the bag than would be the case with a bottle. In most instances, the laboratory will prepare the samples for analysis in the sample bottles, allowing any sample transferred to the bottle wall to be collected.

3.6.2. COMPOSITE SAMPLES

Compositing of samples is a popular means of minimizing analytical costs. However, appropriate sampling and result reporting methods must be followed. Additionally, care must be taken when deciding to composite, for a positive lab result may require individual resampling of all surfaces represented by that composite sample. Therefore, it is highly recommended that composite samples be reserved for those areas, in the Consultant's judgment, are anticipated not to be contaminated.

Each sample area composited must be 1ft² for lead and 100 cm² for methamphetamine. For example, to composite wipe samples of four discrete wall areas in a kitchen, there must be four, 100 cm² wipes. Each wipe sample will be done with a #40 Whatman Filter Paper or similar (see Note to Attachment I), with compositing accomplished by the lab in the extraction process. **The maximum number of wipe samples that may be composited is four.**

The use of common sense when compositing is strongly encouraged. Don't composite an area or item that is likely to be contaminated (e.g., obvious staining) with areas unlikely to show contamination (e.g., remote from known cooking areas), if for no other reason than that SCDRM will assume an attempt to dilute the sample from the likely contaminated areas to below instrument detection limits. The composite samples must be of like surfaces, such as walls with walls within each individual room.

There should be no between-appliance compositing (e.g., stove AND refrigerator AND microwave). The Consultant may consider compositing samples within an appliance (e.g., in a stove: burners, oven, handles, knobs, surface, etc.), but defining 100 cm² sample areas will be difficult.

3.7. GROSS REMEDIATION

Materials associated with the operating Clan Lab, such as containers of chemicals and lab equipment should have been removed by the law enforcement cleanup contractor at the time the lab was seized. If the Consultant finds any such materials during the site assessment process, the material should be left in place and the SCDRM Hazardous Materials Specialist notified immediately.

3.8. RESIDUAL REMEDIATION

A number of processes are associated with making the property suitable for occupancy, as determined by Solano County.

Note that the degree to which areas adjoining a space used for cooking activities are significantly contaminated is difficult to predict; long-term or high volume activities are likely to have impacted adjoining areas. As a result, it is generally most cost effective to assume low-level contamination by non-volatile materials and rid these and other areas of all potentially contaminated porous materials or items. Such decisions are to be reflected in the Remediation Work Plan.

All material disposal associated with the site remediation process shall be in accordance with Section 7.0, "Waste Disposal."

3.8.1. REMOVAL

1. Visibly contaminated (etched or stained) sinks, bathtubs, toilets and similar fixtures are to be intensively cleaned or be removed and evaluated for proper disposal (See Section 7).
2. Porous materials (e.g., carpeting, suspended ceiling panels, wallpaper, etc.) that can absorb dust, powder, aerosols and vapors from the cooking process shall be removed and properly disposed. In most cases, the cost of analytical testing, cleaning and post-testing exceeds the cost of replacement of these articles. While SCDRM strongly recommends that this apply to furniture and clothing, SCDRM has no authority to require that property contents be disposed.
3. “Popcorn” spray-on ceiling coatings applied prior to 1979 may contain asbestos and may be sampled to prove absence of asbestos. It should not be disturbed unless there is gross staining and if asbestos is present, any such work must be directed by a Cal/OSHA Certified Asbestos Consultant. A sealant, of the type typically used for asbestos-containing spray-on finishes, should be applied to the ceiling if low concentrations of contaminants are detected.
4. Some nonporous and semi-porous surfaces (e.g., floors, countertops, tiles, walls and ceilings) can hold contamination from the cooking process, particularly in those areas where cooking and preparation was performed and chemicals were stored. Either intensive cleaning (see below) or complete removal and replacement of that surface are required. This could include removal and replacement of wallboard, floor coverings, concrete slabs, and countertops. Procedures that specify the protocols for intensive cleaning or removal and replacement shall be described in the Remediation Work Plan.
5. Appliances that were in the room in which cooking was conducted shall be disposed (They have too many surfaces to sample to prove that they are sufficiently clean for food preparation or storage). All other appliances associated with food preparation or storage located outside the cooking area must be sampled for analytical testing.
6. Painted surfaces in homes constructed before 1978 may contain lead and may be sampled to prove absence of lead or lead compounds. It should not be removed unless there is gross staining; if lead or lead compounds are present, any such work must be directed by a State of California Certified Lead Assessor.

3.8.2. SURFACE WASHING

Surface washing takes many forms, including pressure washing, detergent-washer washing, solvent (alcohol) washing, steam cleaning, and others. The objective is to remove contaminants to below the California Health and Safety Code Human Occupancy Limits by an efficient and cost-effective method that generates a minimal waste stream. Note that all wash solutions and rinsate must be effectively collected for disposal (see Section 7.0).

Bay West, a consultant to the Minnesota Department of Health, conducted limited research on the efficacy of several cleaning methods. The process and results can be found in the material at <http://www.health.state.mn.us/divs/eh/meth/sideclean.html>.

3.8.3. ENCAPSULATION

Where porous or semi-porous surfaces (e.g., walls, wood flooring, panels, ceiling, concrete) have had levels of contamination that permitted in-situ cleaning instead of removal and replacement, such surfaces shall be encapsulated with an oil-based paint, varnish, or similar sealant. Water-based latex paints appear to have a greater tendency to permit “bleed-through” than oil-based coatings. The sealant is to be applied after surface washing has been completed. After the sealant has cured according

to the manufacturer's instruction, sampling and analysis must be conducted to assure that any remaining contamination is below SCDRM criteria.

3.8.4. VENTILATION SYSTEM

Ventilation systems tend to collect fumes, vapors and dust, and redistribute them throughout a structure. The vents, stove hoods, ductwork, filters and even the walls and ceilings near the ventilation ducts can become contaminated. Absence evidence to the contrary, all air filters in the system shall be replaced, ventilation registers removed and cleaned, and surfaces near inlets and outlets cleaned. Cleaning of system ductwork should be considered, although the efficacy of duct cleaning is subject to debate; US EPA's article on duct cleaning is at the following link:
<http://www.epa.gov/iaq/pubs/airduct.html>.

In motels, apartments, row-houses or other multiple-family dwellings, a ventilation system may serve more than one unit or structure. These connections must be considered when evaluating remediation and testing procedures. One strategy is to take samples from adjacent or connected areas/rooms/units, working outward from the lab site until samples show results below SCDRM criteria.

Anecdotal evidence indicates that rooms adjacent to the cooking area may be impacted by active or passive ventilation (distributing fumes and vapors) or by poor chemical handling and hygiene practices. As is the case with other jurisdictions, SCDRM will require evaluation and possible decontamination of areas adjacent to the cooking area. Such areas may include hallways and other high traffic areas, as well as adjacent rooms. The Consultant shall consider this in the PSA Work Plan.

3.8.5. IMPACTED SOIL AND GROUNDWATER

Evidence that Clan Lab operations may have impacted soil or groundwater moves some aspects of the Clan Lab remediation process out from the direct oversight of SCDRM. Such potential impacts will be investigated and remediated under normal regulatory criteria for hazardous waste sites. Typically oversight for hazardous waste site remediation is conducted by the California Department of Toxic Substances Control; if groundwater may be impacted, oversight may be shared with the Regional Water Quality Control Board. These agencies may, under certain circumstances, transfer oversight responsibility to the Site Mitigation program of SCDRM. Responsible parties may have the option of requesting the Site Mitigation program to provide oversight of the voluntary remediation of the hazardous waste site component of the property; such oversight would be provided on a fee-for-service basis.

The variables associated with hazardous waste site remediation are numerous, and will not be discussed in this document. In the event that the Preliminary Site Assessment report identifies potential impacts to soil and/or groundwater, SCDRM will work with the Property Owner and Consultant to determine the appropriate path for further assessment and mitigation activities and associated regulatory oversight. The Property Owner or the Consultant should contact Matthew Geisert, Hazardous Materials Supervisor, MS, RHSP and/or Misty Kaltreider, P.G., Geologist of the SCDRM Site Mitigation program for direction regarding soil and/or groundwater contamination. Mr. Geisert and Ms. Kaltreider can be reached at 707-784-6765. If SCDRM performs regulatory oversight it will be on a direct cost recovery basis.

DTSC has a significant backlog of remediation sites, but is the appropriate agency for handling complex soil remediation projects. SCDRM can handle straight-forward remediation in a timely manner. A Property Owner with soil contamination can request SCDRM to oversee the soil/groundwater investigation and cleanup if the soil/groundwater will be cleaned up to the San Francisco Regional Water Quality Control Board's Environmental Screening Levels, US Environmental Protection Agency Preliminary Remediation Goals, or background levels. SCDRM will inform DTSC that the Property Owner has requested SCDRM oversight, and the work can proceed. If the Property Owner has a more complex remediation, and wishes to utilize site specific risk-based cleanup levels, the site may be transferred to DTSC or SCDRM will work with DTSC and either the Central Valley or San Francisco Regional Water Quality Control Board for toxicological review. SCDRM does not have toxicologists on staff to review such cleanups.

3.9. REMEDIATION WORK-PLAN

If the results of the PSA show that the property requires remediation of chemical contamination before re-occupancy can be permitted, the Property Owner's representative must develop a remediation Work Plan for review by SCDRM. While it is anticipated that the Consultant will prepare the Remediation Work Plan, it may also be prepared by the Contractor. **The remedial activities shall not commence until SCDRM has reviewed and approved the Remediation Work Plan.** The written Remediation Work Plan must include:

1. Timeline – The timeline should identify the key work elements, indicate the estimated time to complete each element, and show start-end time estimates for each element.
2. Location – Street address and mailing address of the contaminated property, owner of record and his/her mailing address, legal description, and clear directions for locating the property.
3. Site map – A diagram of the contaminated property, including floor plans of affected buildings, local drinking water wells and nearby streams (if potentially impacted) drawn to a scale of 1/4" to 1' unless otherwise directed by the SCDRM Hazardous Materials Specialist. The diagram shall show the location of damage and contamination and the location of sampling points used in the PSA; the sampling point locations shall be keyed to the sampling results.
4. PSA summary – A summary of the information and sampling results obtained in the PSA, and basis for remedial actions (or lack thereof) as proposed in the Remediation Work Plan.
5. Post Remediation Assessment - A plan for the Post-Remediation Assessment (see below), including sampling and analysis protocols.
6. Remediation Procedures – Specific remediation procedures will include a list of any and all materials to be removed, removal procedures, any proposed remediation processes.
7. Waste disposal plan – Provides information on waste disposal as described in the Waste Disposal section (Section 8.0) of this document. Identify the site(s) selected for disposal of waste generated during the remedial activities.
 - o Propose a means to provide evidence that Clan Lab debris (e.g., wallboard, carpets, and appliances) has been properly disposed.

3.10. POST REMEDIATION ASSESSMENT

The purpose of the post-remediation assessment is to establish that the property has been remediated up to the point at which residual contamination is below the State of California Human Occupancy Standards. The assessment should be conducted by the Consultant after remediation has been completed and/or the encapsulant has cured. Sampling protocols for the post-remediation assessment

will have been defined in the approved Work Plan. In general, those areas of the property for which the PSA sampling showed levels above the State of California Human Occupancy standards and were not removed and replaced (e.g., were cleaned, or cleaned and encapsulated) are to be sampled in the same manner used for the PSA. If all sample results fall below the human occupancy standards, then the remediation work is complete and the Consultant can prepare the final report. Any areas that fail the post-remediation sampling are to be re-cleaned/re-encapsulated, then re-sampled.

3.11. FINAL REPORT

There are two options for the Final Report of Remediation. If the remedial action consisted solely of removal of contaminated surfaces, such as cabinets, floor coverings, sheetrock and similar materials, and post-remediation sampling and assessment is not required by SCDRM, then the Contractor must provide to SCDRM signed and notarized written documentation establishing in detail that the remediation work has been completed in accordance with the approved Work Plan. This documentation shall include proof of proper disposal of contaminated items and building materials removed from the property as part of the remediation process. Note that any remediation activity other than removal of contaminated surfaces requires post-remediation sampling and assessment.

Where the Work Plan includes actions other than removal of contaminated surfaces (e.g., removal of some surfaces, cleaning of others), the Final Report of Remediation will have two components. The Contractor must provide to the Consultant signed written documentation establishing in detail that the remediation work has been completed in accordance with the approved Work Plan. This documentation shall include proof of proper disposal of contaminated items and building materials removed from the property as part of the remediation process.

The Consultant will include the Contractor's documentation as an attachment to the Final Report. The Consultant's Final Report of Remediation will focus on the process and results of the post-remediation sampling and analysis, and will reference the Contractor's documentation as necessary to establish that the remediation has been completed in accordance with the approved Work Plan.

The Final Report must be signed and sealed by the CIH, signed and notarized by the Contractor, and if applicable signed and sealed by the PE and/or PG who conducted the Preliminary Site Assessment and the Post Remediation Assessment. SCDRM will review the Final Report within 15 days of receipt.

If the Final Report is not satisfactory to SCDRM, it will be returned to the Consultant and/or Contractor with comments for clarification, additional information, or other items that may remedy Report deficiencies. Consultant and/or Contractor shall timely resolve the Report's deficiencies and resubmit the Report to SCDRM for evaluation.

Within 10 days after SCDRM determines that the Final Report meets the requirements of the approved Work Plan, State of California Human Occupancy standards, and the Property Owner pays the total amount of the lien, SCDRM will write a No Further Action letter concurring with the reports findings/recommendation of human occupancy and remove the lien from the property title.

The Final Report is a technical document, summarizing the work performed under the Work Plan and presenting the data collected during the Post Remediation Assessment. The components of the Final Report shall include:

1. Case Narrative
2. Site Description
3. Summary of PSA findings and recommendations
4. Summary and documentation of remedial actions
5. Post-remediation assessment with detailed description and documentation, including lab reports and scaled site map keyed to sample locations
6. Post-remediation assessment results, with Consultant's analysis and all recommendations.

Unless otherwise specified: Surface sample data must be reported as $\mu\text{g}/100\text{cm}^2$ for Methamphetamine & $\mu\text{g}/1\text{ft}^2$ for Lead and Lead Compounds. Air sample data must be reported as ng/m^3 for Mercury and Mercury Compounds.

Analytical methodology must reference standard U.S. EPA methods or equivalent established methods used to analyze the samples.

4.0. HUMAN OCCUPANCY STANDARDS

California Health and Safety Code require the following criteria to be met for all samples prior to SCDRM writing a "closure letter" allowing occupancy. These or similar criteria are currently in use by several state health agencies throughout the United States, and represent best estimates of minimal health risk from exposure to remaining contamination. The California Health and Safety Code assumes that any property may, at some point in time, be occupied by members of the general population susceptible to injury from exposure to chemicals associated with Clan Lab operations; such groups include the very young, the very old, and individuals with compromised immune systems. The following State of California Standards assumes wipe sampling conducted according to Attachment I, or as otherwise directed by the analytical laboratory.

Wipe Sampling

Methamphetamine	$0.1\mu\text{g}/100\text{cm}^2$ (H&SC 25400.16)
Lead & Lead Compounds	$20\mu\text{g}/\text{ft}^2$ (H&SC 25400.16)

Air Monitoring

Mercury & Mercury Compounds	$50\text{ng}/\text{m}^3$ (H&SC 25400.16)
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These human health occupancy standards are interim levels and will be changed when DTSC establishes health-based target remediation standards for methamphetamine to determine when a property contaminated by methamphetamine laboratory activity only is "safe" for human occupancy.

5.0. ANALYTICAL AND SAMPLING METHODS

Analytical methods are driven by the analyte, and sampling methods are frequently driven by the analytical method. SCDRM expects that sampling methods will follow criteria for wipe and bulk sampling presented in Attachment I. Exceptions to this can be specific methods proscribed by the laboratory, or alternative methods in general use in environmental and occupational health practice. Examples include methods from US EPA SW-846, OSHA Sampling and Analytical Methods, NIOSH Analytical Methods, and, in the case of lead, U.S. Health and Urban Development (HUD) guidelines.

Analytical methods for wipe and bulk samples are expected to be from US EPA SW-846 or the 600 Series in Appendix A of 40 CFR 136. The ELAP labs (see below) may modify these methods as appropriate for the analyte.

Methamphetamine samples shall be analyzed by modified Method 8270. According to Washington Department of Ecology-accredited labs, modified Method 8015 is prone to false positives. As indicated above and in Attachment I, wipe samples are to be obtained with 11 cm #40 Whatman Filter Paper (p/n 1440-110) or similar (see Note to Attachment I) wetted with methanol, stored and shipped in appropriate sampling jars.

SCDRM will not accept field analyses for clearance samples. This includes the use of colorimetric detector tubes, real-time direct reading instruments such as flame ionization and photo ionization detectors, any type of Haz Cat evaluation, and Marquis/Meth reagents, pH paper, or similar.

6.0. LABORATORY REQUIREMENTS

All analyses are to be conducted by analytical laboratories which are accredited (Fields of Testing E114-E117) by the California Dept. of Health Service Environmental Laboratory Accreditation Program (ELAP); a list of such labs is available at:

<http://www.dhs.ca.gov/ps/ls/elap/html/LablistStart.htm>. Note that this list is not limited to labs in California, as California has ELAP reciprocity with several states, and California's ELAP list includes many out-of-state labs.

SCDRM strongly recommends that analysis for methamphetamine be conducted by laboratories accredited for such analyses by the Washington State Department of Ecology; these labs have historically had reciprocity under California ELAP as Washington ELAP labs. A list may be found at <http://www.doh.wa.gov/ehp/ts/CDL/CDLAnalyticalLabs.htm>.

7.0. WASTE DISPOSAL

All materials removed from a Clan Lab property as a result of having been impacted/contaminated by Clan Lab activities (operation, storage, spills, disposal) must receive special handling at the disposal or recycling facility. Examples of such materials are kitchen appliances, drapes, carpets, and building materials. Items such as appliances and furniture must be rendered unusable prior to disposal.

In general, those items which are first cleaned (e.g., washed with Simple Green or similar surfactant and triple-rinsed) have historically been disposed at a Class III landfill. **Always contact the landfill to check the current status for acceptance of these materials.** These cleaned items are to be taken directly to the landfill for special handling, not to a transfer station. The landfill may request laboratory analysis before accepting these cleaned items.

Materials and debris which have not been cleaned are typically disposed at a Class II landfill. A Class III Landfill may take these items on a limited basis. Contact the applicable landfill for specific information.

For any disposed items, SCDRM will require an inventory, as well as waste disposal receipts submitted with the final clearance report. For items that are required to be disposed as hazardous waste, copies of the Uniform Hazardous Waste Manifests are required.

Each landfill facility has its own permit requirements to meet, and will likely review Methamphetamine Laboratory debris on a case by case basis. It is up to the Contractor to contact the landfill to determine if a specific material removed from a Methamphetamine Laboratory property will be accepted, and the conditions under which it will be accepted. Anecdotal information indicates that building materials and furnishings typically do not have to be disposed of as hazardous waste.

8.0. SEPTIC SYSTEMS

If there is evidence that waste were dumped down a drain, the Consultant will need to work through a process to determine whether a septic system was impacted. The following process is illustrated by the flowchart below.

1. Evaluate tubs, sinks, toilets and similar for evidence of waste disposal. Staining from hydroiodic acid (red/orange) would be a good visual indicator.
 - a. If there is no evidence of disposal, the task is complete.
 - b. If there is evidence of disposal, continue to element 2.
2. Assuming evidence of disposal, determine whether the property is on septic or sewer system. Local water quality agencies, Contact numbers as of January 2006:
 - **Fairfield Suisun Sewer District (707) 429-8930**
 - **City of Fairfield (707) 428-7407** **City of Dixon (707) 678-7050**
 - **City of Rio Vista (707)374-6747** **City of Vacaville (707) 449-5128**
 - **City of Benicia (707) 746-4394** **City of Vallejo (707) 648-4345**
 - **City of Suisun (707) 421-7340**
 - **Vallejo Flood and Sanitation District (707) 644-8949**
 - **Solano Irrigation District (707) 448-6847**
 - **Solano County Water Agency (707) 451-6090**
 - a. If the property is on a sewer system, the task is complete.
 - b. If the property is on a septic system, continue to element 3.
3. Obtain a representative sample of the material in the septic tank. Have the sample analyzed for hazardous waste characteristics. Use an ELAP-accredited laboratory appropriate for the analysis.
 - a. If analysis indicates that the sample is non-hazardous, the task is complete.
 - b. If analysis indicates that the sample is hazardous, continue to element 4.
4. Using resources such as the SWRCB tables of disposal facilities to determine which facility will accept the mixed septic/hazardous waste. Use an appropriately-permitted hazardous waste transporter to pump the tank and transport the contents to the accepting facility.
5. Information regarding the positive analysis for hazardous waste characteristics shall be provided to the SCDRM Site Assessment/Mitigation Section, which will evaluate whether remediation action will be required for the leach field (see section 3.8.7).

ATTACHMENT I

The Surrogate Method

As noted in Section 3.6, the Department of Resource Management has reviewed a number of sampling methods from a variety of sources, and has determined that a standard method based on the “Proposed Surrogate Method” devised by Bruce Lazarus, CIH, will be the benchmark for evaluating sampling protocols. Lazarus’ paper describing this method was published in the Journal of Clandestine Laboratory Investigating Chemists, Volume 10, Number 2, April 2000. Most of the material in this Attachment is taken from this article.

It should be noted that few individuals outside of the law enforcement community have Lazarus’ experience in Clandestine Laboratory health risks and assessments. His background as a Certified Industrial Hygienist in the environmental remediation and emergency response industry, as well as his extensive work with Clan Lab investigation and remediation, provide him with a unique perspective for designing a cost-effective investigation process.

In the Surrogate Method, a limited number of laboratory samples are taken from judgmentally-selected locations throughout the clandestine laboratory site and analyzed for the target analytes. This design method attempts to balance the necessary cost burden of assessment activities against the public health need to ensure that no significant residual contamination is unknowingly allowed to persist uncorrected. The surrogate approach is based on the following concepts:

- A. There is a lack of test methods and reference standards for many of the substances, and especially some of the organic drug compounds, which are associated with clandestine lab activities. In short, one can’t feasibly test for all hazardous materials associated with the cooking process, and even if test methods were available, it would be prohibitively expensive to do so.
- B. Some target chemicals tend to be more persistent in the environment, both in porous media and on non-porous surfaces, allowing for latent detection.
- C. The presence and concentration variability of target chemicals assessed at laboratory sites is assumed to be representative of similar conditions for the remaining Clan Lab chemicals not specially analyzed for owing to the reasons outlined above. The premise assumes that if the target analytes are detected in significant concentration, then other Clan Lab method-specific chemicals not analyzed for are also present in concentrations of public health interest. Conversely, if the target analytes are not detected, or detected in very low concentrations, it may be inferred, following this presumption, that chemical not analyzed for are also likely to be not present, or present in concentrations low enough not to be of public health concern.

These assumptions define a data gap suitable for future study. However, absent an alternative method that concurrently minimizes the cost of investigation while providing adequate information to indicate potential public health risk, the Surrogate Method is the minimum level of site investigation acceptable to SCDRM.

SCDRM Criteria under the Surrogate Method follow.

A. Sample Types

A combination of wipe and bulk samples should be taken utilizing this protocol. Wipe samples should be taken of non-porous surfaces, whereas bulk samples should be taken of porous materials.

1. Wipe samples should be taken of sealed concrete (garage floors), vinyl flooring, sealed wood surfaces, tile, Formica, bathroom fixtures, appliance surfaces, painted surface of good condition, etc.
2. Bulk samples should be taken of unsealed or poor condition concrete and wood surfaces, dry wall, painted surfaces of poor condition, carpeting, carpet padding, upholstery, septic waste, and soils.

In some cases, particularly with painted surfaces, a decision must be made if a wipe sample or bulk sample would be more appropriate to recover and identify potential contamination. To address error associated with mass loading of bulk samples, particularly from painted surface and drywall, it may be appropriate to obtain bulk samples using a surface scraping technique.

B. Sample Locations and Quantities

Take one bulk or wipe sample from the following as associated with each major area of the location suspected by history and/or visual observations as being potentially affected by contamination:

1. Each major floor surface.
2. Each major wall surface.
3. Each major ceiling surface.
4. Each major home appliance (e.g., refrigerator, oven, microwave, dishwasher, washing machine, dryer, etc.).
5. Each major cabinet, counter, and/or built-in feature (e.g., kitchen cabinets, counters, vanities, etc.).
6. Each bathroom and/or kitchen fixture or grouping of fixtures.
7. Each major furniture grouping.

In establishing the number and location of samples at individual property sites, sampling of some locations or items may not be necessary if the need for remediation is apparent by observation or agreement of parties. Examples include fire-damaged surfaces, apparent direct chemical staining or damage, and/or obvious physical damage of an item or feature necessitating removal.

C. Collection Procedures

1. Wipe Samples

Wipe samples should be obtained using the following protocol unless otherwise instructed by the analytical laboratory. Note that these instructions differ from Lazarus' paper, as lab requirements have been refined.

- a. Use eight-ounce, wide mouth, borosilicate glass jars having phenolic screw top lids with Teflon liners.
- b. Prepare each sample by placing an 11 cm #40 Whatman Filter Paper (p/n 1440-110) or similar (see Note) into each sample jar. Add 5 ml of methanol to each pad and close the jar. Use appropriate personal protective equipment when using methanol.
- c. Select the surface location to be sampled.
- d. Squeeze excess methanol from the pad (back into the open jar) before wiping the sample area.
- e. Wipe a one hundred square centimeter (100 cm²) surface area, using a consistent wipe or blot pattern technique (i.e., concentric circle pattern starting in the upper left corner and ending in the center of the area). Use a 10-by-10 cm square template (usually made of Teflon or other material that will not contaminate the sample and is resistant to the solvent).
- f. Without allowing the filter to contact any other surfaces, fold the filter with the exposed side in, the fold it again. Return the filter to the glass jar and replace the lid.
- g. Wear disposable Nitrile or PVC gloves for each sample taken. Change gloves between samples.
- h. Obtain separate wipe samples (separate jar and pads) for each individual analyte, including pH, to be analyzed by the laboratory unless the laboratory explicitly states that multiple analytes can be tested from one pad. Otherwise, if multiple analytes are to be tested, then all wipe samples from a selected location should be of adjacent, contiguous surfaces. Do not re-wipe the same surface.
- i. Preservation of the samples for inorganic analysis is not normally required unless otherwise specified by the analytical laboratory.
- j. When appropriate, submit a sample blank consisting of a prepared sample jar taken to the field and returned to the laboratory for analysis.
- k. Label the jar, attach custody seal, and prepare sample for transport to the laboratory.
- l. See Section 3.6.2 for information on compositing samples.

NOTE: In some cases, specific to the surface being sampled, it may be preferable to use sterile gauze pads.

2. Bulk Samples

Bulk samples should be obtained using the following protocol unless otherwise instructed by the analytical laboratory:

- a. Use four- or eight-ounce, wide mouth, borosilicate glass jars having phenolic screw top lids with Teflon liners.
- b. Select the media to be bulk sampled.
- c. Using an appropriate sampling tool/device, obtain a minimum of 30 grams for each bulk sample unless the analytical laboratory specifies a different quantity of sample.
- d. Wear disposable Nitrile or PVC gloves for each sample taken. Change gloves between samples.
- e. Unless otherwise specified by the analytical laboratory, multiple analytes, including pH, may be analyzed from single bulk sample representing each medium to be evaluated.
- f. Sampling tools/device should be cleaned and triple-rinsed with deionized water between each bulk sample or otherwise cleaned following a laboratory-recommended protocol between samples.
- g. For scrape samples of paint, etc., a polyethylene tray (or similar capture device) may be taped to the wall surface below the surface area to be scraped. Collect the sample in the tray and then transfer it to the sample container.
- h. Preservation of the samples for inorganic analysis is not normally required unless otherwise specified by the analytical laboratory.
- i. Bulk samples for organic analysis should be preserved at 4°C (usually applies to septic waste and subsurface soil samples recovered for volatile and semi-volatile hydrocarbon analysis).

D. Target Analytes

Analytes specified for analysis should be selected based on individual association with specific Clan Lab manufacturing processes, expected persistence in the environment, usefulness of data interpretation, application of available testing methods, laboratory capabilities, and cost of analysis. The table below provides selected target analytes and test methods appropriate for the most common Methamphetamine synthesis routes typically encountered in the United States. This table should be used as a guide only, as it may not be necessary or appropriate to sample and analyze for every analyte listed.

Target Analytes for Four Common Methamphetamine Manufacturing Methods

Manufacturing Method	Methamphetamine ¹	Precursor	Hydrochloric Acid (Chloride)	Essential Chemicals (or by-products) ²
Red Phosphorous	Modified EPA Method 8270	Ephedrine by Modified EPA Method 8270	EPA Method 300	Total Phosphorous by EPA Method 6010 ³ Iodide by EPA Method 300
Ammonia	Modified EPA Method 8270	Ephedrine by Modified EPA Method 8270	EPA Method 300	Total Lithium or Total Sodium by EPA Method 6010 ³ Total Ammonia by EPA Method 350
Mercuric Chloride	Modified EPA Method 8270	Phenyl-2-Propanone by Modified EPA Method 8270	EPA Method 300	Mercury by EPA Method 7471A Total Lead by EPA Method 6010

NOTE: approved labs (e.g., ELAP labs) may select methods other than those listed in this table.

¹ Results for Modified EPA Method 8270 may be semi-quantitative depending on analytical laboratory capabilities.

² Select one or more analytes for sampling and analysis, based on property data and assessment needs.

³ Metals analysis may also be performed by EPA Method 6020.

ATTACHMENT II

Chemicals of Concern

Taken from the CSTI Clandestine Drug Laboratory Chemical Identification training manual, the following is a less than exhaustive list of typical lab chemicals.

Methamphetamine Methods of Production and Chemicals Typically Used

- Hydroiodic Acid Method (Ephedrine)
 - Ephedrine
 - Hydroiodic acid
 - Red phosphorous
 - Sodium hydroxide
 - Hydrochloric acid
 - Freon
- Phenyl-2-Propanone Method (P-2-P)
 - Phenyl-2-Propanone
 - Methylamine
 - Methyl Alcohol
 - Mercuric chloride
 - Aluminum
 - Ether
 - Sodium hydroxide
- Sodium Metal Method (Nazi or Birch)
 - Ephedrine
 - Pseudo ephedrine
 - Anhydrous ammonia
 - Sodium (metal)
 - Lithium (metal)
 - Hydrochloric acid

ATTACHMENT III

Resources

Materials used the development of this criteria document include:

Criteria for the Assessment and Remediation of Clandestine Methamphetamine Laboratories

Sacramento County Environmental Management Department

<http://>

Guidelines for Cleaning Up Former Methamphetamine Labs

Missouri Department of Health and Senior Services

<http://www.health.state.mo.us/ResourceMaterial/meth.pdf>

Guidelines for Contamination Reduction and Sampling at Illegal Drug Manufacturing Sites

Washington State Department of Health, Office of Toxic Substances

<http://www.doh.wa.gov/ehp/ts/CDL.HTM>

Clandestine Laboratory Contaminated Properties: Assessment and Remediation Strategies,

Bruce Lazarus, CIH

Journal of Clandestine Laboratory Investigating Chemists, V. 10, No.2, April 2000

Illegal Methamphetamine Laboratories

University of Arizona College of Public Health

<http://www.publichealth.arizona.edu/organization/divisions/division3/methlab/index.html>

Clandestine Drug Lab Cleanup Program

Oregon Public Health Services, Environmental Services and Consultation

<http://www.ohd.hr.state.or.us/esc/druglab/welcome.htm>

Cleanup of Clandestine Methamphetamine Labs (draft)

Colorado Department of Public Health and the Environment

<http://www.gcglc.com/LEPCHandbook/methlabcleanup.pdf>

Meth and Clandestine Drug Labs

Minnesota Department of Health

<http://www.health.state.mn.us/divs/eh/meth/index.html>

Surface and Dermal Monitoring for Toxic Exposures

Ness, Shirley A. 1994. Van Nostrand Reinhold, New York.

Appendix E

Chapter 246-205 WAC

Decontamination of illegal drug manufacturing or storage sites Last Update: 6/18/03

Chapter Listing

WAC Sections

246-205-001 Purpose and authority.

246-205-010 Definitions.

DECONTAMINATION CONTRACTOR CERTIFICATION

246-205-021 Training provider certification.

246-205-031 Basic training course content.

246-205-041 Refresher training course.

246-205-051 Certified training provider responsibilities.

246-205-061 Training provider certification renewal.

246-205-071 Worker and supervisor certification.

246-205-081 Worker and supervisor certification renewal.

246-205-091 Contractor certification.

246-205-101 Reciprocity.

246-205-111 Performance standards.

246-205-121 Denial, suspension, revocation of certification, and civil penalties.

246-205-131 Certified contractor list.

LOCAL HEALTH OFFICER RESPONSIBILITIES

246-205-510 Local health officer responsibilities.

246-205-520 Posting property.

246-205-530 Inspecting property.

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DISPOSITIONS OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

246-205-020 Authorized contractor services. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-020, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-030 Courses for training workers and supervisors. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-030, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-040 Training course approval. [Statutory Authority: RCW 64.44.060 and 64.44.070. 92-02-017 (Order 223SB), § 246-205-040, filed 12/23/91, effective 1/23/92. Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-040, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-050 Worker and supervisor certification. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-050, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-060 Worker and supervisor certificate renewal. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-060, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-070 Authorized contractor certification. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-070, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-080 Reciprocity. [Statutory Authority: RCW 64.44.060 and 64.44.070. 92-02-017 (Order 223SB), § 246-205-080, filed 12/23/91, effective 1/23/92. Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-080, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-090 On-site supervision. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-090, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-100 Performance standards. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-100, filed 1/24/91, effective 4/1/91.] Repealed by

03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-110 Denial, suspension, revocation of certification, and civil penalties. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-110, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-120 Authorized contractor certification list. [Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-120, filed 1/24/91, effective 4/1/91.] Repealed by 03-02-022, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.44.070.

246-205-001

Purpose and authority.

(1) This chapter is adopted to protect the public's health, safety, and welfare by establishing standards, procedures, and responsibilities for:

(a) The certification of contractors and their employees authorized to perform decontamination of illegal drug manufacturing or storage sites; and

(b) Regulating the occupancy and use of property where hazardous chemicals or chemical residues commonly associated with the manufacture of illegal drugs are or may be present.

(2) The statutory authority for the adoption of this chapter is chapter 64.44 RCW.

(a) Contractor certification rules are jointly adopted by the state board of health and the department of health; and

(b) Rules in this chapter pertaining to local health officers' responsibilities are adopted by the state board of health.

(3) This chapter does not apply to industrial sites where a person's manufacturing process uses a hazardous chemical when licensed or regulated by state or federal agencies.

[Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-001, filed 4/29/92, effective 5/30/92. Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-001, filed 1/24/91, effective 4/1/91.]

246-205-010

Definitions.

For the purposes of this chapter, the following words and phrases shall have the following meanings unless the content clearly indicates otherwise.

“Authorized contractor” means any person or persons:

- Registered under chapter 18.27 RCW; and
- Certified by the department to decontaminate, demolish, or dispose of contaminated property as required by chapter 64.44 RCW and this chapter.

“Basic course” means a training course which has been sponsored or approved by the department for workers and supervisors who perform or supervise decontamination on illegal drug manufacturing or storage sites.

“Certificate” means a department issued written approval under this chapter.

“Certified” means a person who has department issued written approval under this chapter.

“Contaminated” or “contamination” means polluted by hazardous chemicals so that the property is unfit for human habitation or use due to immediate or long-term hazards. Property that at one time was contaminated, but has been satisfactorily decontaminated according to procedures established by the state board of health is not “contaminated.”

“Decontamination” means the process of reducing levels of known contaminants to the lowest practical level using currently available methods and processes.

“Department” means the Washington state department of health.

“Disposal of contaminated property” means the disposition of contaminated property under the provisions of chapter 70.105 RCW.

“Hazardous chemicals” means the following substances used in the manufacture of illegal drugs:

- Hazardous substances as defined in RCW 70.105D.020; and
- Precursor substances as defined in RCW 69.43.010 which the state board of health, in consultation with the state board of pharmacy, has determined present an immediate or long-term health hazard to humans.

“Illegal drug manufacturing or storage site” means any property where a person illegally manufactures or stores a controlled substance or a law enforcement agency or the property owner believes a person illegally manufactured or stored a controlled substance.

“Initial site assessment” means the first evaluation of a property to determine the nature and extent of observable damage and contamination.

“List of contaminated properties” means a list of properties contaminated by illegal drug manufacturing or the storage of hazardous chemicals.

“Local department” means the jurisdictional local health department or district.

“Local health officer” means a health officer or authorized representative as defined under chapters 70.05, 70.08, and 70.46 RCW.

“Person” means an individual, firm, association, copartnership, political subdivision, government agency, municipality, industry, public or private corporation, or other entity.

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“Posting” means attaching a written or printed announcement conspicuously on property which may be, or is determined to be, contaminated by illegal drug manufacturing or the storage of a hazardous chemical.

“Property” means any site, lot, parcel of land, structure, or part of a structure involved in the illegal manufacture of a drug or storage of a hazardous chemical including, but not limited to:

- Single-family residences;
- Units or multiplexes;
- Condominiums;
- Apartment buildings;
- Motels and hotels;
- Boats;
- Motor vehicles;
- Trailers;
- Manufactured housing;
- Any ship, booth, or garden; or
- Any site, lot, parcel of land, structure, or part of a structure that may be contaminated by previous use.

“Property owner” means a person with a lawful right of possession of the property by reason of obtaining it by purchase, exchange, gift, lease, inheritance, or legal action.

“Refresher course” means a department sponsored or approved biennial training course for decontamination workers and supervisors. An approved refresher course:

- Reviews the subjects taught in the initial training course; and
- Includes updated information on emerging decontamination technology.

“Storage site” means any property used for the storage of hazardous chemicals or illegally manufactured controlled substances.

“Supervisor” means a person certified by the department and employed by an authorized contractor who is on site during the decontamination of an illegal drug manufacturing or storage site and who is responsible for the activities performed.

“Worker” means a person certified by the department and employed by an authorized contractor who performs decontamination of an illegal drug manufacturing or storage site.

“Warning” means a sign posted by the local health officer conspicuously on the site of an illegal drug manufacturing or storage site informing potential occupants that hazardous chemicals may exist on, or have been removed from, the premises and that entry is unsafe.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-010, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-010, filed 4/29/92, effective 5/30/92. Statutory Authority: RCW 64.44.060 and 64.44.070. 92-02-017 (Order 223SB), § 246-205-010, filed 12/23/91, effective 1/23/92. Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-010, filed 1/24/91, effective 4/1/91.]

246-205-021

Training provider certification.

(1) Persons wanting to become an illegal drug lab decontamination training provider must obtain department approval of instructors and courses. The types of drug lab decontamination courses that may be approved by the department are:

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- (a) Basic worker;
- (b) Basic supervisor; and
- (c) Refresher worker and supervisor.

(2) To obtain approval of instructors, the applicant must demonstrate that the person has the breadth of knowledge and experience necessary to properly train workers and supervisors.

(3) To obtain approval of course work, the applicant must demonstrate the:

- (a) Adequacy and accuracy of content; and
- (b) Adequacy of training techniques.

(4) Applicants for training provider certification shall:

(a) Submit a completed training provider application as specified under subsection (5) of this section;

(b) Submit the required fee as specified under WAC 246-205-990; and

(c) Ensure the department receives the application sixty or more days before the requested approval date.

(5) A training provider application includes, but is not limited to:

(a) A completed training provider application form provided by the department;

(b) A list of all personnel involved in course presentation and a description of their qualifications;

- (c) A detailed description of course content and the amount of time allotted to each major topic;
 - (d) A description of teaching methods;
 - (e) A list of questions for development of an examination; and
 - (f) Copies of all materials proposed for use, when requested from the department.
- (6) Training provider certification is valid for two years from the date of issuance.
- (7) Training provider certification may be terminated if the training provider fails to:
- (a) Maintain the course content and quality as approved by the department; and
 - (b) Make changes to a course as required by the department.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-021, filed 12/23/02, effective 1/23/03.]

246-205-031

Basic training course content.

Department approved basic worker and supervisor training courses shall provide at a minimum:

(1) Information on state and federal laws, rules, and regulations applicable to illegal drug manufacturing or storage sites including, but not limited to, Contaminated properties, chapter 64.44 RCW; Precursor drugs, chapter 69.43 RCW; Uniform Controlled Substances Act, chapter 69.50 RCW; Washington Industrial Safety and Health Act, chapter 49.17 RCW; the Federal Occupational Health and Safety Act, 29 U.S.C. 651 et seq.; and this chapter.

(2) Chemical terminology, classifications, and properties related to illegal drug manufacturing.

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(3) Illegal drug laboratory characteristics.

(4) First aid.

(5) Adverse health effects of exposure related to illegal drug manufacturing including, but not limited to:

(a) Toxicology; and

(b) Symptomology.

(6) Incompatibility of chemicals related to decontamination.

(7) Techniques and equipment used for decontamination of property.

(8) Handling unknown substances.

(9) State and federal requirements for dealing with hazardous materials including, but not limited to, chapter 173-303 WAC related to:

(a) Disposal;

(b) Transportation;

(c) Storage; and

(d) Reporting.

(10) Training for supervisors must also include, but not be limited to:

(a) Obtaining necessary information for making site assessments;

- (b) Initial site assessment;
- (c) Initial site sampling;
- (d) Work plan development;
- (e) Final site sampling;
- (f) Report completion; and
- (g) Penalties and liabilities.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-031, filed 12/23/02, effective 1/23/03.]

246-205-041

Refresher training course.

(1) A refresher training course is required every two years for workers and supervisors.

(2) Department approved refresher worker and supervisor training courses shall provide at a minimum:

(a) A thorough review of the subjects required under WAC 246-205-031;

(b) An update of information on state-of-the-art procedures and equipment;

(c) A review of regulatory changes and interpretation; and

(d) Other subjects if required by the department to update information on new technology and procedures.

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[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-041, filed 12/23/02, effective 1/23/03.]

246-205-051

Certified training provider responsibilities.

(1) Prior to any training, the training provider shall:

(a) Notify the department in writing thirty or more days before training is scheduled to begin. The notification shall include the date, time, and address of the location where training will be conducted;

(b) Ensure that the size of the class is appropriate for learning the course content;

(c) Incorporate into training any required subject matter developed by the department;

(d) Obtain department approval in advance of any changes to the training; and

(e) Maintain the course content and quality as approved by the department.

(2) When requested by the department, the training provider shall confirm successful completion of CDL worker or supervisor training courses by applicants seeking CDL worker or supervisor certification.

(3) At the department's request, the training provider shall allow a department representative to attend a training course as an observer to verify that the training provider conducts the training in accordance with the training approved by the department.

(4) Training providers conducting training outside the state of Washington shall:

(a) Reimburse the department at current state of Washington per diem and travel allowance rates for travel expenses associated with department observance of the training courses; and

(b) Submit reimbursement to the department within thirty days of receipt of the billing notice.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-051, filed 12/23/02, effective 1/23/03.]

246-205-061

Training provider certification renewal.

Training providers seeking renewal certification shall submit the following to the department thirty or more days before expiration of the current certificate:

- (1) A completed training provider application as described in WAC 246-205-021(5); and
- (2) A fee as prescribed in WAC 246-205-990.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-061, filed 12/23/02, effective 1/23/03.]

246-205-071

Worker and supervisor certification.

(1) Applicants seeking certification as a decontamination worker shall ensure the department receives the following within sixty days of completing the basic worker course:

- (a) A completed decontamination worker application;
- (b) A fee as prescribed in WAC 246-205-990;
- (c) Evidence of satisfying the requirements of WAC 296-62-30410;

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(d) Evidence of successful completion of a department sponsored or approved basic decontamination worker course; and

(e) Evidence of passing the basic decontamination worker examination administered by the department with a score of seventy percent or higher.

(2) Applicants seeking certification as a decontamination supervisor shall ensure the department receives the following within sixty days of completing the basic supervisor course:

(a) A completed decontamination supervisor application;

(b) A fee as prescribed in WAC 246-205-990;

(c) Evidence of a valid Washington state decontamination worker certificate;

(d) Evidence of forty or more hours of on-site experience in hazardous material or illegal drug manufacturing or storage site decontamination projects;

(e) Evidence of satisfying the requirements of WAC 296-62-30415.

(f) Evidence of successful completion of a department sponsored or approved basic decontamination supervisor course; and

(g) Evidence of passing the basic decontamination supervisor examination administered by the department with a score of seventy percent or higher.

(3) Applicants for decontamination supervisor certification who can demonstrate that their work experience and training has resulted in experience and training equivalent to the requirements in WAC 246-205-031 and 246-205-071 (1)(c) and (2)(c), (d), and (e) may be certified as a CDL supervisor when they apply prior to May 1, 2003.

(a) For purposes of this subsection, an application includes:

(i) A completed decontamination supervisor application form;

(ii) A fee as prescribed in WAC 246-205-990; and

(iii) Evidence of meeting the requirements of this subsection.

(b) All other decontamination supervisor certification requirements of this chapter apply.

(4) Worker and supervisor certificates are valid for two years from the date of issuance.

(5) Workers and supervisors shall make certificates available for inspection at all times during an illegal drug manufacturing or storage site decontamination project.

(6) The certificate may be denied, suspended, or revoked as described in WAC 246-205-121.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-071, filed 12/23/02, effective 1/23/03.]

246-205-081

Worker and supervisor certification renewal.

(1) Worker and supervisor certification is valid for two years from the date of issuance.

(2) Certified workers and supervisors seeking certificate renewal shall submit to the department thirty or more days before expiration of the current certificate:

(a) A completed application form for certificate renewal;

(b) A fee prescribed in WAC 246-205-990; and

(c) Evidence of successful completion of a department sponsored or approved refresher training course.

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(3) If a previously certified worker applies for certification following expiration of the previous certificate, but less than two years after expiration of the previous certificate, the worker shall:

- (a) Submit to the department a completed application form for certificate renewal;
- (b) Submit to the department a fee prescribed in WAC 246-205-990; and
- (c) Retake the entire basic worker course.

(4) If a previously certified supervisor applies for certification following expiration of the previous certificate, but less than two years after expiration of the previous certificate, the supervisor shall:

- (a) Submit to the department a completed application form for certificate renewal;
- (b) Submit to the department a fee prescribed in WAC 246-205-990; and
- (c) Retake the entire basic supervisor course.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-081, filed 12/23/02, effective 1/23/03.]

246-205-091

Contractor certification.

(1) A contractor may advertise, offer to undertake, or perform decontamination, demolition, or disposal work at an illegal drug manufacturing or storage site only after securing a certificate from the department.

(2) Applicants for department certification as an authorized contractor, shall submit to the department:

(a) Evidence of being licensed, bonded, and insured as a general contractor under the provisions of chapter 18.27 RCW;

(b) Evidence of department certification for each employee who will do work on an illegal drug manufacturing or storage site;

(c) Documentation that the contractor has at least one department certified supervisor and one department certified worker;

(d) A completed decontamination contractor application form; and

(e) A fee as prescribed in WAC 246-205-990.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-091, filed 12/23/02, effective 1/23/03.]

246-205-101

Reciprocity.

(1) The department may provide reciprocal certification for contractors, supervisors, and workers trained and certified in another state if standards and training are substantially equivalent to those of this chapter.

(2) Applicants for reciprocity shall submit to the department:

(a) A completed application form for the type of certification being requested;

(b) Documentation of specialized training for illegal drug manufacturing or storage site decontamination;

(c) Evidence of successful completion of training required by the Federal Occupational Safety and Health Act, 29 U.S.C. 651 et seq.; Washington Industrial Safety and Health Act regulations, chapter 49.17 RCW; and

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(d) A fee as prescribed in WAC 246-205-990.

(3) Prior to certificate approval, the applicant may be required to:

(a) Submit additional information;

(b) Successfully complete a refresher course; or

(c) Pass a department-administered examination with a score of seventy percent or more.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-101, filed 12/23/02, effective 1/23/03.]

246-205-111

Performance standards.

Authorized contractors, including workers and supervisors, working at a decontamination site shall, at a minimum:

(1) Perform all decontamination work only with department certified workers and supervisors;

(2) File a work plan with and obtain approval from the local health department;

(3) Perform work in accordance with the approved work plan;

(4) Station on site a contractor-employed certified supervisor to oversee the activities performed;

(5) Perform work meeting applicable requirements of state and local building codes;

(6) Comply with applicable Federal Occupational Safety and Health Act, Public Law 91-596, 84 stat. 1590; and Washington Industrial Safety and Health Act regulations and requirements, chapter 49.17 RCW;

(7) Comply with applicable requirements of chapter 70.105 RCW, Hazardous waste management; and chapter 173-303 WAC, Dangerous waste regulations;

(8) Comply with applicable requirements of department of ecology and Environmental Protection Agency regulations;

(9) Comply with applicable contractor regulations;

(10) Notify the state and local jurisdictional health department of all work performed within ten days after completion of the project;

(11) Comply with all other applicable laws and regulations; and

(12) Comply with this chapter.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-111, filed 12/23/02, effective 1/23/03.]

246-205-121

Denial, suspension, revocation of certification, and civil penalties.

(1) An initial, renewal, or reciprocal illegal drug manufacturing or storage site decontamination worker, supervisor, or contractor certificate will be denied when an applicant fails to meet the requirements of WAC 246-205-071, 246-205-081, 246-205-091 or 246-205-101.

(2) Disciplinary action against a decontamination worker, supervisor, or contractor may be taken for failing to comply with the requirements of chapter 64.44 RCW, or any rule adopted under chapter 64.44 RCW. Disciplinary action may be taken on any of the following grounds:

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(a) Failing to perform decontamination, demolition, or disposal work under the supervision of trained personnel;

(b) Failing to file a work plan;

(c) Failing to perform work pursuant to the work plan;

(d) Failing to perform work that meets the requirements of the department;

(e) Obtaining a certificate by error, fraud, or misrepresentation; or

(f) If the person has been certified pursuant to RCW 74.20A.320 by the department of social and health services as a person who is not in compliance with a support order or a residential or visitation order. If the person has continued to meet all other requirements for reinstatement during the suspension, reissuance of the license or certificate shall be automatic upon the department's receipt of a release issued by the department of social and health services stating that the person is in compliance with the order.

(3) Disciplinary action against a decontamination worker, supervisor, or contractor may include, but not be limited to, denial, suspension, or revocation of certification.

(4) A contractor may be assessed a civil penalty not to exceed five hundred dollars for each violation in addition to certification denial, suspension, or revocation pursuant to this rule. Each day the violation continues shall be considered a separate violation.

(5) Adjudicative proceedings are governed by chapter 34.05 RCW, the Administrative Procedure Act; chapter 246-10 WAC; and this chapter.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-121, filed 12/23/02, effective 1/23/03.]

246-205-131

Certified contractor list.

(1) The department shall maintain a list of authorized illegal drug manufacturing or storage site decontamination contractors.

(2) The department's authorized contractor list shall be made available to local health officials and other appropriate agencies semiannually, and to the public upon request.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-131, filed 12/23/02, effective 1/23/03.]

246-205-510

Local health officer responsibilities.

As required by chapter 64.44 RCW, the local health officer's responsibilities shall include, but not be limited to:

- (1) Posting property;
- (2) Inspecting property;
- (3) Determining contamination;
- (4) Reporting contaminated property;
- (5) Notification of contaminated property;
- (6) Determining whether a contractor is required for decontamination;
- (7) Verifying decontamination; and

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(8) Recording decontamination.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-510, filed 12/23/02, effective 1/23/03.]

246-205-520

Posting property.

(1) Within one working day of notification from a law enforcement agency of potential contamination, the local health officer shall post a written warning on the premises. The warning shall inform potential occupants that hazardous chemicals may exist on, or have been removed from the property and that entry is unsafe.

(2) Within fourteen days of notification, the local health officer shall inspect the property.

(3) If the property is contaminated, the local health officer shall post a written notice on the premises declaring that the officer intends to issue an order prohibiting use of the property as long as the property is contaminated.

(4) Within ten working days of determining the property is contaminated, the local health officer shall cause to be served an order prohibiting use as required under WAC 246-205-560.

(5) Within one working day of issuance of the order, the local health officer shall post the order in a conspicuous place on the property.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-520, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-520, filed 4/29/92, effective 5/30/92.]

246-205-530

Inspecting property.

Within fourteen days after a law enforcement agency or property owner notifies the local health officer of potential property contamination, the local health officer shall inspect the property.

(1) To enable the local health officer to determine contamination, the property inspection shall include, but not be limited to, an acquisition of data such as evidence of:

- (a) Hazardous chemical use or storage on site;
- (b) Chemical stains;
- (c) Release or spillage of hazardous chemicals on the property; or
- (d) Glassware or other paraphernalia associated with the manufacture of illegal drugs on site.

(2) As part of the property's inspection, the local health officer may request copies of any law enforcement reports, forensic chemist reports, and any department of ecology hazardous material transportation manifests needed to evaluate:

- (a) The length of time the property was used as an illegal drug manufacturing or storage site;
- (b) The size of the site actually used for the manufacture or storage of illegal drugs;
- (c) What chemical process was involved in the manufacture of illegal drugs;
- (d) What chemicals were removed from the scene; and
- (e) The location of the illegal drug manufacturing or storage site in relation to the habitable areas of the property.

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(3) The local health officer may coordinate the property's inspection with other appropriate agencies. At the request of the local health officer, the Washington state department of ecology may conduct an environmental assessment and may sample the property's ground water, surface water, septic tank water, soil, and other media as necessary to enable the local health officer to evaluate the long-term public health threats.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-530, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-530, filed 4/29/92, effective 5/30/92.]

246-205-531

Sampling procedures.

(1) The analytical results obtained through sampling may be used as a method to determine contamination. Types of sample collection include, but are not limited to:

- (a) Nonporous surface;
- (b) Porous surface;
- (c) Air;
- (d) Drinking water;
- (e) Ground water;
- (f) Surface water;
- (g) Soil; and
- (h) Septic system.

(2) Collection of samples shall be performed by department of ecology staff; department

of health certified CDL supervisors; or local health officers using:

(a) Standards and protocols to ensure accuracy and the ability to produce similar results with repeated sampling;

(b) Proper swabbing techniques to collect a representative sample of the area being sampled; and

(c) Proper care and prudent action to avoid contamination during sampling.

(3) All samples collected, transported, stored, and analyzed under the provisions of this section must be secured to assure an unbroken chain-of-custody as described in the American Society of Testing Materials Standard D 4840.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-531, filed 12/23/02, effective 1/23/03.]

246-205-540

Determining contamination.

(1) The local health officer shall make a determination of contamination when the inspection reveals the property is contaminated.

(2) If designated contaminated, the local health officer shall post and cause to be served an order prohibiting use of all or portions of the property as required under WAC 246-205-520 and 246-205-560.

(3) If the local health officer determines the property is not contaminated, the local health officer shall document the findings. The local health officer's documentation shall include:

(a) Findings;

(b) Conclusions;

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- (c) Name of the property owner;
- (d) Mailing and street address of the property owner;
- (e) Parcel identification number and legal description of the property; and
- (f) Clear directions for locating the property.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-540, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-540, filed 4/29/92, effective 5/30/92.]

246-205-541

Decontamination standards.

The decontamination standards include:

- (1) Methamphetamine of less than or equal to 0.1 micro grams per 100 square centimeters;
- (2) Total lead of less than or equal to 20 micro grams per square foot;
- (3) Mercury of less than or equal to 50 nano grams per cubic meter in air; and
- (4) Volatile organic compounds (VOCs) of 1 part per million total hydrocarbons and VOCs in air.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-541, filed 12/23/02, effective 1/23/03.]

246-205-550

Reporting contaminated property.

(1) When property is determined contaminated, the local health officer shall report the contaminated property to the state department of health:

- (a) By telephone or e-mail within one working day; and
- (b) In writing within ten working days.

(2) The local health officer's written contamination report to the state department of health shall include:

- (a) Description of the findings;
- (b) Conclusions;
- (c) Name of the property owner;
- (d) Mailing and street address, including zip code and county, of the property owner;
- (e) Parcel identification number and legal description of the property to including township and section;
- (f) Tax account number; and
- (g) Date property determined contaminated.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-550, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-550, filed 4/29/92, effective 5/30/92.]

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246-205-560

Notification of contaminated property.

(1) Within ten working days after the local health officer's determination that a property is contaminated, the local health officer shall cause to be served, either personally or by certified mail, return receipt requested, an order prohibiting use to all known:

(a) Occupants; and

(b) Persons having an interest in the property as shown upon the records of the auditor's office of the county in which the property is located.

(2) If the whereabouts of persons described under subsection (1) of this section is unknown and the same cannot be ascertained by the local health officer in the exercise of reasonable diligence, and the health officer makes an affidavit to that effect, then the serving of the order upon such persons may be made by:

(a) Personal service; or

(b) Mailing a copy of the order by certified mail, postage prepaid, return receipt requested:

(i) To each person at the address appearing on the last equalized tax assessment roll of the county where the property is located; or

(ii) At the address known to the county assessor.

(3) The local health officer shall also mail a copy of the order addressed to each person or party having a recorded right, title, estate, lien, or interest in the property.

(4) The local health officer's order shall:

(a) Describe the local health officer's intended course of action;

(b) Describe the penalties for noncompliance with the order;

(c) Prohibit use of all or portions of the property as long as the property is contaminated;

(d) Describe what measures a property owner must take to have the property decontaminated; and

(e) Indicate the potential health risks involved.

(5) The local health officer shall:

(a) File a copy of the order prohibiting use of the property with the county auditor;

(b) Provide a copy of the order to the local building or code enforcement department; and

(c) Post the order in a conspicuous place on the property within one working day of issuance of the order.

(6) The local health officer's order shall advise that:

(a) A hearing before the local health officer or local health board shall be held upon the request of a person required to be notified of the order;

(b) The person's request for a hearing shall be made within ten days of the local health officer's serving of the order;

(c) The hearing shall be held not less than twenty days nor more than thirty days after the serving of the order; and

(d) In any hearing concerning whether property is contaminated, the property owner has the burden of showing that the property is decontaminated and meets the decontamination standards of WAC 246-205-541.

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[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-560, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-560, filed 4/29/92, effective 5/30/92.]

246-205-570

Decontamination.

(1) An owner of contaminated property who desires to reduce the contamination shall use the services of an authorized contractor unless otherwise authorized by the local health officer.

(2) The local health officer shall provide the property owner with a list of authorized contractors upon request.

(3) When an authorized contractor is required for decontamination, the property owner shall have a written work plan approved by the local health officer before starting decontamination.

(4) When an authorized contractor is required for decontamination, the contractor shall prepare the work plan in accordance with this chapter and chapter 64.44 RCW. When the local health officer determines the services of an authorized contractor are not necessary, the local health officer shall take appropriate measures to ensure the property is decontaminated consistent with the purposes of chapter 64.44 RCW.

(5) The property owner or the contractor shall decontaminate the property according to the approved work plan and to meet the decontamination standards described in WAC 246-205-541.

(6) The property owner shall be responsible for:

(a) The costs of any property testing which may be required to demonstrate the presence or absence of hazardous chemicals;

(b) The costs of the property's decontamination and disposal expenses, as well as costs incurred by the local health officer resulting from the enforcement of this chapter;

(c) Keeping records documenting decontamination procedures and submitting notarized copies of all records to the local health officer; and

(d) Petitioning the local health officer to review the decontamination records and to declare the property decontaminated.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-570, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-570, filed 4/29/92, effective 5/30/92.]

246-205-580

Verifying decontamination.

Within ten working days of a request for review of decontamination records, the local health officer:

(1) Shall review the documentation to verify decontamination was performed according to the approved work plan and the applicable decontamination standards in WAC 246-205-541 are met;

(2) May visit the property site to assess the thoroughness of the decontamination;

(3) May require the property owner to provide more extensive testing and assessment of the property site by an independent laboratory or firm qualified to perform such testing and assessment.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-580, filed 12/23/02, effective 1/23/03. Statutory Authority: RCW 64.40.070 [64.44.070] and chapter 64.44 RCW. 92-10-027 (Order 268B), § 246-205-580, filed 4/29/92, effective 5/30/92.]

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246-205-590

Recording decontamination.

If, after review of the information in WAC 246-205-580, the local health officer determines the property has been decontaminated, the local health officer shall within ten working days:

(1) Record a release for reuse document in the real property records of the county auditor where the property is located indicating that to the best of his or her knowledge, the property was decontaminated in accordance with this chapter.

(2) Send a copy of the release to the property owner.

(3) Send a copy of the release to the state department of health.

(4) Send a copy of the release to the local building or code enforcement department.

[Statutory Authority: RCW 64.44.070. 03-02-022, § 246-205-590, filed 12/23/02, effective 1/23/03.]

246-205-990

Fees.

(1) The department shall charge fees for issuance and renewal of certificates. The department shall set the fees by rule.

(2) The fees shall cover the cost of issuing certificates, filing papers and notices, and administering this chapter. The costs shall include reproduction, travel, per diem, and administrative and legal support costs.

(3) Fees are nonrefundable and shall be in the form of check or money order made payable to the department.

(4) The department shall require payment of the following fees upon receipt of application:

(a) Twenty-eight dollars shall be assessed for each initial, renewal, or reciprocal worker certificate application.

(b) Twenty-eight dollars shall be assessed for each initial, renewal, or reciprocal supervisor certificate application.

(c) Five hundred seventy dollars shall be assessed for each initial, renewal, or reciprocal authorized contractor certificate application. The applicant's certificate shall expire annually on the expiration date of the contractor's license issued under the provisions of chapter 18.27 RCW.

(d) Two hundred seventeen dollars shall be assessed for each initial application and fifty-two dollars shall be assessed for each renewal application for illegal drug manufacturing or storage site decontamination training course approval.

[Statutory Authority: RCW 43.70.250 and 43.70.110. 03-13-123, § 246-205-990, filed 6/18/03, effective 7/19/03. Statutory Authority: RCW 43.70.250, 70.90.150, and 43.20B.250. 01-14-047, § 246-205-990, filed 6/29/01, effective 7/30/01. Statutory Authority: RCW 43.70.250. 00-02-016, § 246-205-990, filed 12/27/99, effective 1/27/00; 99-12-022, § 246-205-990, filed 5/24/99, effective 6/24/99. Statutory Authority: RCW 64.44.060 and chapter 64.44 RCW. 91-04-007 (Order 125SB), § 246-205-990, filed 1/24/91, effective 4/1/91.]s

Appendix E



Clandestine Drug Lab General Cleanup Guidance

**Minnesota Department of Health
Minnesota Pollution Control Agency**

July 1, 2006

Appendix E



Minnesota Pollution Control Agency

Minnesota Department of Health (MDH) and Minnesota Pollution Control Agency (MPCA) Clandestine Drug Lab General Cleanup Guidance

July 1, 2006 Version

For more information, contact:

Minnesota Department of Health
Division of Environmental Health
625 North Robert Street
St. Paul, MN 55101-2516

Tel: 651-201-4896 or 651-201-4922
Toll Free: 888-657-3908
Cell: 651-238-7831
FAX: 651-201-4606
TDD: 651-201-5797

ACKNOWLEDGEMENTS

This guidance is based on other states' guidance documents and past experiences, in particular, Arizona, Colorado, Oregon, and Washington. Assistance from members of the California Department of Toxic Substance Control (DTSC) and the National Jewish Medical and Research Center has been invaluable.

The Minnesota Pollution Control Agency and Minnesota Department of Health, Public Health Laboratory have studied and continue to study contaminated materials from former meth lab structures in Minnesota. Financial support for the former meth lab distribution and cleaning effectiveness studies has been provided by the federal Environmental Protection Agency (EPA) Brownfield Grant Program.

The guidance was further developed by incorporating findings of these studies and discussion with other members of the National Alliance of Model State Drug Laws (NAMSDL) National Working Group on Cleanup and Remediation of Methamphetamine Laboratories.

As with earlier versions, Minnesota local public health personnel, state agency staff and private abatement contractors have provided comment, criticism and immeasurable assistance with each draft.

We thank everyone for his or her continuing efforts.

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VI. Exterior Evaluation and Remediation

This portion of the Guidance has been written and will be maintained by the Minnesota Pollution Control Agency. For assessment and remediation information related to the following topics, see <http://www.pca.state.mn.us/cleanup/meth.html>

- A. Groundwater
- B. Wells
- C. Surface Water
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<http://www.pca.state.mn.us/cleanup/meth.html>

MDH/MPCA Clandestine Lab Contractors' Procedural Report

I. INTRODUCTION

This document is designed to assist property owners, remediation contractors, and local authorities with their efforts to reduce exposure to contamination from former drug labs. The guidance is based on current information from a national working group on meth lab contamination remediation, other states' guidance documents, and the preliminary results of Minnesota research.

NOTE: *The first U.S. guidance for cleanup of clandestine drug labs was adopted by the State of Washington in 1996. Several states have followed with adaptations of this first document. Neither this nor any other guidance provides science-based advice for removal of all potential risk to human health. This document does provide best current practice for reducing exposures to toxic chemicals used in methamphetamine (meth) manufacture. The guidance will be revised as research and practice reveal a better understanding of meth chemicals, testing and remediation.*

Although meth is not the only drug manufactured in clandestine labs, meth labs are the most common and will be the focus of this document. Contractors working on remediation of non-meth labs may contact the Minnesota Department of Health (MDH) Meth Program for advice on remediation of those labs.

There are two specific areas of meth lab “cleanup” commonly called **removal** and **remediation**. **Removal** occurs when a meth lab is identified and seized by law enforcement, and bulk chemicals, equipment and wastes are removed by a hazardous waste contractor under contract with the United States Drug Enforcement Administration (DEA) or paid by a local agency. This guidance addresses the **remediation** of residual contamination that exists after the bulk **removal** of chemicals and chemical wastes.

The main focus of this guidance is management and sampling of meth and other chemical residues *within structures*. This guidance uses meth as a surrogate for all other chemicals and is based on the premise that removal of meth will provide adequate management of other contaminants.

Similarly, guidance regarding *outdoor contamination* focuses on solid wastes and volatile solvents, and is based on the premise that management of volatile solvents will provide adequate management of other outdoor contaminants.

A companion document, *Clandestine Lab Contractors' Procedural Report (Contractors Report)*, can be used to document interior and exterior assessment and remediation activities, and can serve as a record of remediation decisions and actions. The local authority that oversees remediation can require use of the *Contractors' Report* or allow an alternative format prepared by the contractor.

The *Contractors' Report*, this guidance and its *Appendices* can be found on the Minnesota Department of Health (MDH) website at:
<http://www.health.state.mn.us/divs/eh/meth/lab/labcleanup.html#guidance>.

This guidance is effective as of July 1, 2006.

II. PRE-REMEDATION CONSIDERATIONS

A. Individual and Agency Roles and Responsibilities

Roles and responsibilities for property owners, remediation contractors, law enforcement, public health and other agencies are described in Minnesota statute effective, January 1, 2006. The following link is to the website for House File 1, Article 7, Meth Provisions:

<http://www.health.state.mn.us/divs/eh/meth/ordinance/methlegislation.html>.

NOTE: *Since the meth cleanup legislation became effective on January 1, 2006, there has been some confusion about the meaning, intent and letter of the law. According to that law, a clandestine lab site means, "...any structure or conveyance or outdoor location occupied or affected by conditions or chemicals typically associated with the manufacturing of meth."*

The law also states that, "A county or local health department or sheriff shall order that any property or portion of a property that has been found to be a clandestine lab site and contaminated by substances, chemicals, or items of any kind used in the manufacture of meth or any part of the manufacturing process, or the by-products or degradates of manufacturing meth be prohibited from being occupied or used until it has been assessed and remediated as provided in the Department of Health's ... general cleanup guidelines."

The law is somewhat ambiguous about how a property may be "found to be a clandestine lab" and how we determine whether a property has been "affected by conditions or chemicals..." and therefore must be remediated.

The purpose of this note is to state that the legal and public health determination of a meth lab may not always be the same. For the purposes of safe public health practice, assessment is required whenever lab waste, equipment or chemicals are found on a property, whether or not an arrest or conviction have occurred. It is not sufficiently protective to require remediation only when a working lab has been discovered. The determination whether to sample or clean when there is no sign of cooking and all meth chemicals on site are unopened must be made on a case by case basis and made collaboratively by local law enforcement and public health.

An effective meth lab remediation will involve a cooperative effort among law enforcement, local public health, the property owner and the contractor. The public health or other authority assuming oversight for meth lab remediation will be called the **local authority** (local authority) in this document. The parties involved and their responsibilities are as follows:

The **local authority** will declare a public health nuisance, approve the contractor and work plan, and prohibit re-occupancy of meth lab properties until remediation is complete. The local authority must file certain affidavits upon issuing a no-occupancy order or vacating such an order. The **County Recorder or Registrar of Titles** will record and maintain these affidavits.

There is no **timeline** for assessment or remediation mandated by this guidance. Most Minnesota counties have ordinances that require a contract must be signed or remediation completed within a certain number of days. The **local authority** will work within the timeframe declared by a local ordinance or on a case-by-case basis to assure speedy resolution.

The **property owner** is responsible for the cost of remediation. As with any contracted work, it is in the best interest of the property owner to use caution when hiring someone to provide this service. The property owner should understand the work plan and monitor progress on the site.

The meth legislation, effective January 1, 2006, states that the **lab operator (meth cook)** can be required to pay restitution to public entities and property owners for costs associated with lab response and remediation. Several meth cooks have entered into repayment agreements with local authorities before and after the effective date of this law.

Contractors work *for* property owners and *with* local authorities to assess, sample, clean, and dispose of wastes and materials removed from the property. Contractors should understand and complete remediation according to the guidance and under oversight of the local authority. The contractor will document their work using the *Contractors Report* to the extent required by the local authority.

The local **Community Health Services Administrator** will maintain a list of current and former contaminated properties, including name of the owner, location of the property, extent of the contamination and status of the remediation. That list will be available to the public upon request.

The new law also includes a provision for a **Revolving Cleanup Loan Fund** to expedite remediation of former lab sites. Loans will be made to cities and counties on a first-come, first-served basis and can be made only to entities with ordinances that specifically address meth lab remediation. Loans will come from the public facility authority fund and must be repaid.

More information about the loan process, eligibility and loan application is available from the **Department of Employment and Economic Development (DEED)**. Contact:

- Kathe Barrett, kathe.barrett@state.mn.us, 800-657-3858 or 651-205-4223

Minnesota Department of Health (MDH) Methamphetamine Program staff advises local public health officials, law enforcement personnel, property owners and others. MDH will oversee sampling and remediation of facilities that operate under MDH permit or license (e.g., hotels, motels, restaurants). MDH will assist local officials assessing the health implications of indoor contaminant levels. MDH is responsible for maintaining this guidance. While MDH does not certify or license contractors, MDH will maintain a list on the MDH website of contractors that claim to meet the qualifications of this guidance.

MDH Methamphetamine Program contacts and information:

- MDH Website: <http://www.health.state.mn.us/divs/eh/meth>
- Deborah Durkin, deborah.durkin@health.state.mn.us, 651-201-4896
- Scott Henderson, scott.henderson@health.state.mn.us, 651-201-4922

Regarding contamination in licensed food, beverage or lodging establishments:

- MDH Environmental Health Services Section, 651-201-4513 or 1-800-383-9808

Regarding contamination in grocery stores:

- Minnesota Dept. Agriculture, Dave Read, david.read@state.mn.us, 651-201-6596.

Appendix E

Minnesota Pollution Control Agency (MPCA) is responsible for writing and maintaining the sections of this guidance that pertain to waste management, well sampling and groundwater pollution, soil and disposal pit sampling and excavation, and septic tank and drain field sampling and remediation. MPCA will provide verbal guidance on outdoor issues to the local authority having jurisdiction. If requested by the local authority, MPCA may assume oversight of outdoor sampling and remediation in cases of long-term or large production labs, new production methods, neighboring wells close to labs, or confirmed groundwater contamination.

MPCA Methamphetamine Contacts:

- Kate Gaynor, kate.gaynor@state.mn.us, 651-296-4250
- Steve Lee, stephen.lee@state.mn.us, 651-297-8610

Minnesota Occupational Safety and Health Administration (OSHA) provides guidance and enforcement of worker safety training, equipment, and practices. Information is available at: <http://www.doli.state.mn.us/mnosh.html>.

B. Meth Production Methods

Most meth used illegally in Minnesota is imported from Mexico or the southwestern United States. Minnesota labs supply perhaps 15 to 20 percent of meth used in the state. Minnesota labs are typically “user labs,” small in comparison to the “super labs” of the southwest.

There are two methods for making meth in common practice in the U.S. today. Most Minnesota meth “cooks” use variations of the *anhydrous ammonia method* (also called the Birch Reduction method or “Nazi” method). Few lab operations using the *red phosphorous method* have been discovered in Minnesota but they do occur (See *Appendix A, Methamphetamine Manufacturing Process and Common Manufacturing Chemicals*).

Assessment of labs cannot necessarily be based on the method being used at the time of seizure. The meth cooks arrested may not know or be truthful about “cooks” done in the past. Physical evidence at a lab may indicate only the most recent method used; therefore, all persons involved with a former meth lab must be aware of potential hazards created by each of the current meth cooking methods.

Seizure of a large capacity lab (“super lab”) or discovery of new cooking methods or chemicals should be brought to the attention of MDH and MPCA so agency staff can discuss whether this guidance is appropriate and sufficient for the situation.

C. Meth Lab Chemical Contamination

Cooking meth by any method will result in the release of ingredient chemicals, the precursor drugs (pseudoephedrine or ephedrine), meth in vapor and particle form, and other largely unknown byproducts (See *Appendix A*).

Chemicals may enter the body by being breathed, eaten, injected (by a contaminated needle or accidental skin prick), or absorbed by the skin. Both acute (short term) and chronic (long term) health hazards result from the manufacturing of meth. Acute exposure hazards come from direct contact with product or waste, and inhalation of product or wastes. Burns, tissue irritation and rashes can result from chemical spills and skin contact. Headaches, dizziness, nausea, and other health effects can result from inhalation of vapors.

After the cooking process has stopped, most of the known hazards decrease. Proper removal of the production wastes and bulk chemicals eliminates many of the risks associated with meth labs. Spilled volatile chemicals and solvents such as ammonia, methanol, ether or acetone will move into air and will be readily removed from the structure by ventilation. Semi-volatile or non-volatile production chemicals such as acids, bases, precursor chemicals, and products used or created in the manufacturing processes are more persistent.

Smoking meth indoors will also distribute meth throughout the structure and the structure's contents. Handling meth, loading meth pipes or syringes, or packaging the drug for distribution may result in spills onto floors and other surfaces.

The risk of injury from chemical exposure depends on the chemical itself, the concentration, the quantity, and the length and route of exposure. Assessment of a lab site should include special attention to:

- **Accessibility of residues, and frequency of direct contact:** The likely use of a contaminated area is an important factor in estimating frequency of contact. For example, residues in a kitchen or bathroom of a house will likely be contacted more frequently than residues in a non-residential outbuilding.
- **Characteristics of the inhabitants or users of the structure:** For example, toddlers who crawl on carpet or floors will have high frequency of skin contact with toxic residues over a considerable area of skin. These residues may directly irritate the skin, and may also be absorbed into the body through the skin. If hand to mouth behavior occurs when hands have been in contact with toxic chemicals, these will be ingested into the body. Hand to eye behavior will introduce toxic materials to the eyes. Toddlers are at greatest risk for hand to mouth and hand to eye behaviors, but all people exhibit them.

The toxicity of meth lab residues will depend upon the amount of the residue, and the chemicals in the residue. The amount of residues will depend upon the size of the meth lab, the length of time it operated, methods of chemical storage and disposal, occurrence of chemical spills, as well as on the physical characteristics of the structure in which the meth lab occurred. The chemicals in the residue will vary with the method of methamphetamine manufacture.

This guidance is based on the presumption that all rooms and all structures on a meth manufacturer's property are considered potentially contaminated. Therefore, these are the standards set forth by this guidance:

- It is **mandatory** that **all structures containing** a meth lab or chemicals must be cleaned or pre-sampled to demonstrate that remediation is unnecessary.
- It is **mandatory** that **all occupancy structures** on a property where a meth lab, chemicals, paraphernalia or wastes are found must be cleaned or pre-sampled to demonstrate that remediation is unnecessary.
- It is **strongly recommended** that all structures on a property where meth labs or chemicals are found be cleaned or sampled. The local authority will make final decisions regarding need for remediation of non-occupancy structures.

More information concerning the need for sampling or remediation of a particular structure or type of structure on a property where a meth lab, equipment or chemicals are discovered can be found in *Appendix C4, Indoor Sampling and Risk Decisions*.

D. Meth Risk Decisions

The process of meth lab risk assessment is complicated by the fact that solid research information is not available regarding:

- impact on human health from exposures within a meth-contaminated structure,
- absorption by skin or distribution of meth throughout the body,
- levels of meth in air of former meth labs that may be harmful, or
- an established safe level for methamphetamine in the environment.

Information does exist on risk levels for many of the volatile solvents or other chemicals used in meth manufacture. However, much of this information is from high-level exposures in industrial settings.

A zero level of meth and other meth lab-related chemicals would provide the lowest risk to occupants of a former lab. The standard of *less than one microgram of meth per square foot of wipe sampled surface (<1 µg/ft²)* used in previous versions of this guidance was set to achieve that “zero meth” goal.

Due to lack of health effects information, this standard and standards used in other states are not health-based. Furthermore, research has shown that sampling for meth is not a reliable measure of the entire volume of meth in a structure. **Therefore, this guidance relies on a remediation process rather than achievement of a number that is not science-based.** The process will reduce risk by reducing exposure to contamination, through a combination of disposal, remediation and encapsulation activities described below.

When determining the level of risk acceptable for a given structure it is necessary to consider potential uses of the structure and the extent of expected human contact. Factors to be considered include, frequency, type of contact and the sensitivity of exposed populations. To reach the following **relative levels of risk** associated with **relative levels of exposure** to meth and other contaminants, the following actions should be taken:

No residual risk

- Remove all structure contents.
- Demolish the structure.
- Dispose of contents and structure in a sanitary landfill.

Minimal residual risk

- Remove all structure contents, including clothing and appliances.
- Remove carpeting, wallpaper and/or unpainted sheetrock (drywall).
- Remove suspended and attached ceiling tiles and/or ceiling texturing.
- Dispose of all contents and structure’s building materials (e.g., ceiling tiles, carpeting) in a sanitary landfill.
- HEPA (High-Efficiency Particulate Air) vacuum all remaining porous surfaces such as raw wood, brick and cement block.
- HEPA vacuum all wood floors and all floors beneath removed carpeting.
- Detergent wash all surfaces twice, rinsing with fresh water.
- Seal remaining contamination by spraying all surfaces with a special encapsulating coating such as those used for asbestos or lead.
- Clean HVAC systems and flush plumbing as directed in this guidance.

Acceptable residual risk

- Remove carpeting, wallpaper and unpainted sheetrock (drywall).
- Remove suspended and attached ceiling tiles.
- Spray paint textured ceilings.
- Remove upholstered furniture, mattresses, paper items, and other porous contents.
- Remove clothing, toys, bedding, baby bottles and cups, and other personal items used by infants and small children.
- Dispose of those items in a sanitary landfill.
- (It is an option to HEPA vacuum, clean and sample *selected* high-value, hard-surface items.)
- (It is optional to wash all clothing - other than those of infants and small children - two times.)
- HEPA vacuum all remaining porous surfaces such as raw wood, brick and cement block.
- HEPA vacuum all wood floors and all floors beneath removed carpeting.
- Detergent wash all structure surfaces twice, rinsing with fresh water.
- Spray paint all structure surfaces with two coats of a high-quality paint, polyurethane or concrete/brick sealer.
- Clean HVAC systems and appliances, and flush plumbing as directed in this guidance.

If a contractor completes remediation as described above, pre- or post-remediation sampling for meth is not required by this guidance. Pre- or post-remediation sampling may be performed for reasons outlined in Appendix C4, *Indoor Sampling and Risk Decisions*.

III. CHEMICAL SAMPLING and ANALYSIS**A. Meth Sampling Options: Wipe Sampling and Micro-Vacuuming**

(See *Appendix C* for sampling procedures.)

Meth wipe samples are typically collected by wiping a wall or other surface with a solvent dampened wipe. Rayon/polyester or cotton general-purpose medical sponges and Whatman filter paper wetted with methanol are often used for surface wipes. For many building materials, the amount of meth removed by wipe collection from the surface is a small fraction of the total amount of meth present in the building material due to the material's surface texture and porosity.

“Micro-vacuuming” is a non-destructive method for sampling porous building materials such as raw wood, brick and unpainted cement block. Micro-vacuuming can also be used on carpeting but is less reliable for use on other fabrics.

Micro-vacuuming is believed to collect meth-contaminated dust and particles *on* building material and *trapped by* surface texture of porous materials. Although micro-vacuuming does not calculate the concentration of meth within the material, this sampling method detects the presence of meth on some materials more reliably than wipe sampling, and is recommended by this guidance for the materials noted above.

B. Directive Sampling Guidance

(*Sampling Protocols* can be found in *Appendices C1-3*. *Appendix C4, Indoor Sampling and Risk Decisions*, can be used to assist with sampling decisions and interpretation of results.)

Appendix E

Under this guidance, testing may include:

- wipe sampling for methamphetamine (optional except to rule out remediation),
- micro-vacuum sampling of porous materials (optional except to rule-out remediation),
- volatile organic compound monitoring in air (recommended), or
- surface pH evaluation (recommended).

Indoor chemical-specific testing is listed in **Table 1** below and described further in the following text. Lead and mercury testing should be limited to illicit drug laboratories where there is clear evidence or high suspicion of use of these metals. All areas tested should be photographed to document the location of the sampled area.

Table 1: Sampling Levels and Their Meaning in This Guidance

Chemical	Interpretation and/or Action Taken
Methamphetamine	<p>a) 1 µg/ft² or greater: Full remediation of occupancy structures must be completed according to Guidance.</p> <p>b) 1 to <10 µg/ft²: Modified cleaning or disposal of some household contents or some non-occupancy structures may be allowed and will be determined by the local authority</p> <p>c) ≥10 µg/ft²: Full remediation of all structures and contents required.</p> <p>See <i>Appendix C4</i> for further explanation of these levels and actions. See NOTE below regarding Meth screening levels.</p>
Corrosives	Clean to: pH 6-8
Volatile Organic Compounds (solvents)	Clean to: <1 ppm total VOCs in air (Common error for Photoionization Detectors (PIDS) can be as much as +/- 5ppm)
Phosphorus / Iodine	Discard stained/affected material
Mercury / Lead	<p>Notify MDH or MPCA before proceeding with remediation or assessment:</p> <p>a. Mercury: Clean to < 0.3 µg/m³ (0.036 ppb) in air. [IRIS Reference Concentration for Chronic Inhalation Exposure RfC]</p> <p>b. Lead: Clean to < 40 µg/ft² wipe sample. [EPA TSCA Section 403]</p>

Methamphetamine Sampling: To determine presence of meth, wipe sampling should be done on non-porous (e.g., metal heat registers, ceiling fans) and horizontal surfaces that have not been cleaned. Due to the variability in analytical results from wipe sampling of building materials this guidance recommends best materials to sample as:

- ceiling fan blades; top surface if unclean, bottom surface if fan blades appear cleaned,
- enameled or painted metal, such as heat register vents and appliances,
- metal or enameled metal high in the room or,
- HVAC plenum, the cold air-return just before furnace.

Samples of vertical and horizontal surfaces in the same area will have varied results. Minnesota research has shown that levels of meth contamination are increasingly higher on vertical surfaces from floor to ceiling. When wipe sampling vertical or horizontal surfaces, wipe sampling is recommended to be done vertically higher within the room.

In general, sampling of unclean horizontal surfaces such as counters, tables and floors will present higher levels of meth contamination due to spills of methamphetamine and precursor chemicals during cooking, packaging and use. In addition, horizontal surfaces are subject to fallout of meth attached to dust from meth cooking and its vapors.

It is recommended that if post-remediation samples are taken, sampling be performed after washing and sealing/painting of surfaces.

Porous materials such as concrete block, raw wood studs, brick and (when disposal is contested) high-value carpeting may be micro-vacuum sampled. This method does not *quantitatively* represent the mass of meth in the material but the results may be used *qualitatively* to indicate presence of meth.

NOTE: *The current screening level of 10 µg/ft² is not a science-based number. Establishment of this discretionary level is an attempt to satisfy a number of issues and concerns that have arisen regarding remediation. For example, contractors have found that rigorous remediation according to the Guidance does not always result in reduction of meth levels to the cleanup standard of <1 µg/ft² that was used in previous versions of the document. Given the unknowns about risks associated with meth, and the unreliability of meth sampling, MDH does not wish to set a standard that is unachievable; or one that will result in unnecessary costs for property owners in order to achieve an uncertain benefit. This screening level should be viewed as a device to allow the local authority sufficient leeway to: 1) allow cleaning and salvage of items and materials that will not be readily available to children and that would otherwise have to be discarded; 2) distinguish between heavily contaminated former lab sites and those that may have been peripherally involved or used for smoking only, 3) to allow for differences in the use of a structure, e.g., residential vs. storage, and 4) to allow for other special circumstances within **the limits of safe practice.***

Corrosives: Commonly used corrosives include but are not limited to Hydrochloric Acid, Sulfuric Acid, Sodium Hydroxide, Anhydrous Ammonia, Phosphoric Acid and Muriatic Acid. Surface pH testing during the assessment process is recommended and should provide reasonable assurance that common acids and bases are not present at levels posing a health hazard.

Volatile Organic Chemicals (VOCs): Commonly used VOCs (solvents) include but are not limited to Acetone, Benzene, Ether, Freon, Hexane, Isopropanol, Methanol, Toluene and Xylene. VOC testing should be conducted in all rooms of the structure, for the safety of workers as well as for assessment purposes and to verify remediation. VOC testing can also be used to detect sources of residual contamination, such as in heating vents, plumbing and sewers.

Phosphorus and Iodine: Removal of stained materials is the best means of remediating contamination involving red phosphorus, iodine crystals, and tincture of iodine. When removal of stained material is not a reasonable option (such as on a concrete floor), the surface can be power-washed, allowed to dry, and then sealed.

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Mercury and Lead: To our knowledge, neither mercury nor lead has been found in a Minnesota lab. Lead and mercury were (uncommonly) present at past lab operations, so screening levels are included here, in the event they may be needed and to raise awareness of their potential use. Typically, the processes (methods using phenyl-2-propanine (P2P) precursor) that used lead and mercuric compounds have been abandoned in favor of simpler methods using lithium or sodium metal, or red phosphorus and iodine.

C. Analytical Laboratory Requirements

The MDH Environmental Laboratory Certification Program is considering rule-making to set procedures for laboratories to become certified for analysis of methamphetamine samples. Information about the certification program can be found at: <http://www.health.state.mn.us/divs/phl/cert/>.

Prior to establishment of a rule and beginning January 1, 2006, all meth wipe sample analyses must be done by a lab that has satisfactorily completed the meth QA/QC checklist found in *Appendix D, Laboratory On-Site Inspection List*. The QA/QC checklist is self-reported and signed by the lab director.

Contractors are responsible for ensuring that a laboratory selected for meth sample analysis certifies compliance with the checklist requirement. Contractors can indicate lab compliance on the *Contractors' Report*.

IV. CONTRACTOR REQUIREMENTS

A. Contractor Training and Site Responsibilities

Minnesota law requires that a remediation contractor conduct meth lab assessment, sampling and remediation using the procedures of this guidance. The Project Manager, the Site Supervisor and workers will do a variety of tasks, each requiring different levels of training, expertise, and personal protective equipment.

NOTE: Minnesota Department of Health (MDH) does not license, regulate, permit, or otherwise certify companies to conduct the cleanup of clandestine drug labs. MDH will maintain a list of contractors that claim to meet the requirements stated in this guidance on their website at: <http://www.health.state.mn.us/divs/eh/meth/lab/labcleanup.html#contractors> but cannot recommend or guarantee the work of any of these companies.

The contractor's **Project Manager** must be specifically named for each site and must meet the training requirements listed in *Contractors Qualifications, Appendix B*. The Project Manager's site activities may be documented using the *Contractors' Report*. The *Contractors' Report* is designed as a standardized form to record the assessment, remediation and decisions made at a site. The local authority may or may not require use of this format. The **Project Manager** should begin communication with the local authority early in the process of developing the work plan, so reporting and other requirements will be clear to all parties.

Duties that must be performed by the **Project Manager** are these:

- Conduct preliminary **site assessment** activities.
- Prepare a **pre-cleaning sampling plan**, if requested by owner or local authority.

- Prepare a **work plan**.
- Prepare a **health and safety** plan.
- Make amendments to plans as required by the local health authority.
- Obtain any required permits.
- Deliver "**Meth Lab Right-to-Know****" training to all workers on the site or ensure that all workers have had Meth Lab Right-to-Know training within the past 12 months.
- Complete and sign the *Contractors' Report (if used)*.
- Submit a **final report** to the local authority.
- Retain the final report in the contractor's records for three years.

** Meth Lab Right-to-Know training is intended to educate individuals working at a meth lab contaminated site to recognize and safely work with hazardous materials specific to a meth lab. The training should include but is not limited to: a) recognition, potential for harm, and handling of common meth chemicals, biological and physical hazards; b) sharps and pathogen briefing; and c) worksite hygiene.

Minnesota law requires that the contractor shall verify to the property owner and the local authority that the work was completed according to MDH guidance. That verification must be provided within five days from the completion of the work.

A **Site Supervisor** may work under the supervision of the Project Manager and must meet the training requirements listed in *Appendix B*.

The **Project Manager** or a qualified **Site Supervisor** must be present on the site when the following activities take place:

- removal of remaining chemicals
- removal of plaster or drywall surfaces
- removal of wallpaper
- removal of carpet, furniture and other dust-raising activities
- scraping of texturized "popcorn" ceilings, or removing tile or other ceilings

The **Project Manager** or a qualified **Site Supervisor** do not need to remain on site during cleaning or painting but must inspect the site upon completion of either activity. If the local authority or another entity requires meth wipe sampling, the Project Manager or Site Supervisor must perform the sampling, unless a (qualified) third party conducts the sampling.

The **Project Manager** or a qualified **Site Supervisor** must inspect the dumpster, truck, roll-off box or other container of structure contents and waste prior to the waste leaving the site. Inspection is to ensure that no hazardous chemicals, containers of anhydrous ammonia, or biohazards (sharps, etc.) are improperly disposed. Either employee must also ensure that all furniture, clothes, carpeting, and other items disposed have been destroyed to prevent scavenging of these items.

A local authority may reject or require replacement of a Project Manager or Site Supervisor if the local authority makes a finding of:

- criminal activity
- disregard for public health or the environment
- failure to comply with the requirements of this guidance or local ordinances
- disregard for and/or noncompliance with health, safety, or pollution rules or standards

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- misrepresentation or falsification of sampling, figures, reports or data
- negligence, incompetence or misconduct in the performance of duties

The activities required to remediate a former meth lab site, the associated personnel requirements required to perform that activity, and recommendations for personal protective equipment (PPE) can also be found in *Appendix B*.

B. Owner-Assisted Remediation

The **Property Owner** may assist with painting or other remediation or reconstruction tasks, after the professional contractor and crew have removed carpeting or other disposables and washed structural surfaces. The property owner may only assist with approval by the contractor and the local authority. In such a case, the contractor's work plan must specify work that can be completed by the property owner or his agent. The contractor and local authority must be in agreement about inspection of such work.

The property owner must receive basic meth lab right-to-know information before performing any on-site activities. This information should also be provided for any service provider who works on a site that has not yet been remediated.

Basic meth right-to-know information for property owners and other workers who will be onsite for brief periods can be found in *Appendix B*.

This guidance allows the owner to assist with remediation only under the following circumstances:

- Meth was the only drug known to be manufactured at the site; and
- The cooking method was red phosphorus or anhydrous ammonia; and
- No visual evidence of lab-related contamination, waste or biohazards remain; and
- No manufacturing-related fire occurred.

C. Lab Site Entry

Most law enforcement agencies in Minnesota will post clan lab properties with signs warning of possible chemical contamination. Occupation of residential structures on properties where meth labs have been discovered will usually be prohibited until after assessment and/or remediation. There may be some circumstances when the local health authority will allow the occupants of a second home to remain in place, e.g., when law enforcement feels certain that the second structure was not involved in any way. (See *Appendix C.4, Regarding Posting of Structures and Removal of Inhabitants.*)

Before entering the site, the contractor should carefully consider the hazard potential from exposure to chemical residues, confined spaces or other physical hazards. A site entry plan is required and should specify equipment needs and procedural planning when such hazards are believed to exist.

D. Preliminary Assessment

After the local authority has approved the Project Manager, the Project Manager must conduct a preliminary assessment of the property and all structures on the property.

Site assessment information to be collected shall include but is not limited to:

- Property description (i.e., physical address, legal description (if possible), physical layout of the property, structural features, etc.)
- Copies of any law enforcement or other reports detailing illegal drug activity, materials removed from the property and materials' locations
- Photographic documentation of site
- Record of:
 - 1) apparent hazardous chemical use or storage areas,
 - 2) apparent waste disposal areas,
 - 3) presumed cooking areas identified by visible contamination or by law enforcement reports mentioning location of labs or lab equipment,
 - 4) chemical stains, fire damage, other observable contamination/damage, and
 - 5) information about surfaces, furnishings, appliances, and other features
- Inspection of ventilation system
- Inspection of plumbing, septic system, sewer system
- Identification of adjacent areas/units in multiple dwellings that may require cleaning
- Identification and documentation of areas of contamination
- Outdoor inspection for evidence of burn or trash pits, discolored soil, or dead vegetation, indicating possible contamination of water and/or soil
- Inspection of well or city water connection
- Identification of neighboring structures, wells, surface water, and other potential receptors within 250 feet of site.

E. Site-Type Considerations

The site of the lab, its structural characteristics and potential future use must be considered when designing a remediation plan. Lab sites may be loosely categorized as follows:

- **Private occupancy structure**, e.g., single family home, apartment or multiple dwelling
- **Licensed facility** (residential or non-residential), e.g., hotel, motel, manufactured home park, restaurant, grocery store, child or adult foster care facilities, etc.
- **Non-occupancy structure**, e.g., garage (attached or unattached), barn, pole barn, tool shed, etc.
- **Mobile residence**, e.g., motor home, camper or manufactured home
- **Other vehicle**, e.g., van, bus, automobile, truck, boat, etc.
- **Other lab sites** that do not fall into any of the previous categories, e.g., tent, deer stand.

The following special considerations apply to site type and use:

- Private (e.g., apartment building) or public (e.g., motel) **multiple dwellings** require careful assessment when determining how much of a structure must be evacuated or cleaned. Adjacent rooms and common areas of multiple dwellings are presumed contaminated and must be cleaned, or sampled to rule out need for cleaning.
- Contamination of **licensed facilities** should be reported to the state or local agency involved in licensure. MDH regulates food, beverage and lodging establishments such as hotels, motels, resorts, restaurants and youth camps. The Minnesota Department of Agriculture regulates grocery and convenience stores. Contact numbers for these agencies can be found in Section II.A of this document.

- Contractors who have performed cleanups on **mobile residences** warn that these structures contain many porous and absorbent materials and may be difficult and costly to remediate. Demolition should be considered.
- Some Minnesota counties mandate demolition of other **vehicles**. This guidance does permit remediation, with pre- and post-remediation sampling of vehicles, if approved by the local authority. It has been demonstrated that remediation (which must usually include disposal of all upholstery and carpeting) often exceeds the value of the contaminated vehicle.

Summary Note: Some Conditions That May Affect Work Plan Decisions

Site History: Indications of severity of contamination, e.g., length of occupancy; real (chemicals or equipment) or anecdotal evidence (odors twice-weekly) gathered by law enforcement or provided by property owner, neighbors or occupants.

Site Use and Occupancy: Potential human (particularly child) exposure, e.g., site is a single-family home, hotel/motel, chicken coop, attached garage.

Sampling Intentions/Evidence: Location and number of samples taken or to be taken will affect ability to plan a modified remediation.

Proximity to Cooking or Storage Areas: Degree of apparent contamination, as indicated by police evidence, chemical staining, signs of fire or explosion, etc.

F. Pre-Remediation Sampling for Absence of Contamination

As stated earlier:

- All rooms and all structures on a meth manufacturer's property are considered potentially contaminated.
- It is **mandatory** that **all structures containing** a meth lab or chemicals must be cleaned or pre-sampled to demonstrate that remediation is unnecessary.
- It is **mandatory** that **all occupancy structures on a property** where a meth lab, chemicals, paraphernalia or wastes are found must be cleaned or pre-sampled to demonstrate that remediation is unnecessary.
- It is **strongly recommended** that all structures on a property where meth labs or chemicals are found be cleaned or sampled.
- **If full remediation of contents and structure is conducted as described below, sampling for meth before cleaning interiors of structures is not required.**
- If the property owner does not wish to presume contamination, the owner must hire a contractor to perform a pre-cleaning assessment to demonstrate low or non-detectable meth levels in the part of the property in question.
- The local authority can direct, or modify a proposed sampling plan, and can accept or reject use of a sampling method, sampling location(s), number of samples, or analytical laboratory to be used.

A pre-remediation sampling plan must clearly demonstrate consideration of the use, materials, and size of each room or structure to be sampled. A sufficient number of wipe samples should

be taken appropriate to the use of the structure. For example, to demonstrate the absence of meth contamination will require at least one meth wipe sample collected from a high and unclean surface in each room of an occupancy structure and each area of an outbuilding. The sampling plan should include sampling of places and materials most likely to be contaminated with meth.

Personal belongings found in a former meth lab structure are presumed contaminated and should be discarded. At the insistence of the property owner and discretion of the contractor and local authority, some items may be: (a) cleaned without sampling, (e.g., eye glasses, adults' clothing, major appliances) or (b) sampled, cleaned and re-sampled (e.g., high-cost, low contact large furniture items). Decisions must be based not only on cost-effectiveness but also potential future use of the items.

G. Contractor and Owner's Work Plan

The Project Manager must prepare a work plan based on the findings of a pre-remediation assessment, as documented in the *Contractors' Report* or similar format. The contractor must submit the work plan to the local authority for review and possible modification and approval. The work plan must include:

- General site health and safety plan
- Site entry plan, as needed
- Location of property
- Photographs and/or drawing of property including floor plans that indicate areas of contamination, damage, chemical storage areas, etc.
- Data from pre-cleaning samples, if presumption of contamination has been challenged
- Property contents, proposed disposal, and cleaning plan of specific contents
- Description of proposed decontamination procedures of structure and specific contents
- Post-decontamination sampling locations and sampling methods to be used
- Identification of analytical laboratory
- Identification of waste disposal site(s)
- Timetable for remediation process
- Identification of Project Manager and Site Supervisor; verification of their training; and notice of who will perform sampling

V. INTERIOR REMEDIATION PROCEDURES

A. Remediation Steps

The *Contractors' Report* or a similar format should be used to document remediation and assessment decisions and actions. The basic steps to clean a former meth lab structure are listed below and described further in the following text.

- **Ventilation:** Ventilate structure for two days before cleaning.
- **Air Quality:** Perform air sampling before and after remediation.
- **Plumbing and Sewer:** Inspect plumbing and sanitary sewer; discard etched or stained fixtures; flush plumbing.
- **Chemical Spills:** Evaluate and clean chemical spills and residues.
- **Porous Items:** Remove and discard upholstered furniture, curtains, mattresses, paper items, and other porous contents including clothing not to be cleaned.

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- **Children's Belongings:** Remove clothing, toys, bedding, baby bottles and cups, and other personal items used by infants and small children.
- **Porous Materials:** Remove and discard carpeting, wallpaper and/or wallboard, suspended and attached ceiling tiles.
- **Optional Remediation:** If local authority agrees, pre-sample, HEPA vacuum, then clean selected high-value, hard-surface items.
- **Disposal:** Dispose all contaminated contents in a sanitary landfill.
- **Structural Cleaning:** (a) HEPA vacuum porous building materials such as concrete block, brick, raw wood studs, wooden floors and all floors under removed carpeting. (b) Double wash with detergent and hot water, followed by a thorough rinse with clean water. Alternatively, concrete and raw wood can be steam cleaned with extraction.
- **Area Segregation:** After each room is cleaned, cordon off doors and openings to other rooms using (at least) 4-mil plastic sheeting to avoid recontamination.
- **HVAC Cleaning:** Clean heating, ventilation and air conditioning (HVAC) system. Replace filters after at the end of the remediation process.
- **Encapsulation:** Encapsulate residual contaminants with two coats of sealant. Paint should be sprayed and not brushed or rolled. Paint should be allowed to cure for the recommended time between coats.
- **Septic:** Empty septic tank if VOCs are present over recommended limits.
- **Outdoors:** Perform outdoor investigation and remediation.
- **Final Ventilation:** Ventilate structure for two days after cleaning.

B. Ventilation

Ventilation of the structure is recommended before, during and after the remediation process except when ventilation may interfere with air sampling. Open all windows and use exhaust fans, blowers and/or negative air machines for two days before and after cleaning. Take care that vented contaminants are not exhausted to air intakes of adjacent structures.

Avoid operating the HVAC system during cleaning of the structure, while contents and carpets are being removed, and while structural surfaces and features are being washed and sealed with paint or other solvent-based coatings. Take care to provide adequate ventilation during sampling and painting.

A half-face cartridge respirator may be necessary during remediation, if adequate ventilation cannot be achieved (e.g., in very cold weather); during the use of solvent cleaners or sampling materials; while removing carpeting and other highly contaminated materials.

C. Indoor Air Quality

Indoor ambient air should be sampled before and after the process (or during the process as deemed necessary by the contractor) using a Photoionization Detector (PID) or similar instrument (see *Appendix C3*). Initially, a sweep through the entire building should be made with an accurate record kept of all readings in every room. Additionally, each septic system drain (floor, tubs, sinks) should be tested with the PID to determine if any chemicals have accumulated in the drain trap.

D. Heating Ventilation and Air Cooling (HVAC) Forced Air System

Assessment of HVAC system should be performed early in the remediation process. Depending on the assessment and the system, the following steps may be required:

- During the remediation of each room or area:
 - Remove and clean, or replace all vents.
 - Remove debris to arm's length.
 - HEPA-vacuum ductwork at least to arm's length.
 - Twice-wash and rinse ductwork at least to arm's length, with hot water and detergent.
- Remove and clean, or replace supply diffusers (based on cost efficiency).
- Replace all filters in the system at the end of the remediation process and after all dust disturbances have occurred.

E. Evaluation of Chemical Spills

All food preparation counter-tops, stained materials, powders and liquids throughout the structure should be pH tested (see *Appendix C3*) to determine their corrosivity. An accurate record of findings should be made.

Acids should be neutralized with sodium bicarbonate (baking soda); and bases with weakly acidic wash solutions (e.g., vinegar, citric or acetic acid). Solids can be scooped up and packaged for proper waste disposal. Liquids can be adsorbed with clay or another non-reactive material and packaged for proper waste disposal. pH paper should be used to check a surface after neutralization. Badly stained or contaminated materials should be removed and discarded.

F. Structure Contents and Furnishings

Contents of a contaminated structure are presumed contaminated and recommended to be disposed. Decisions regarding alternatives to disposal should include the value of the item and potential for future human contact. (See *Appendix C.4* for more detail.)

Table 2. Value and Contact Potential Evaluations

<p>High Value – High Contact Items E.G., Mattresses, carpeting, large upholstered items should almost always be discarded. (See exceptions in text.)</p>	<p>High Value – Low Contact Items E.G., In some circumstances, photographs may be salvaged without cleaning, or large appliances may be cleaned and saved.</p>
<p>Low Value – High Contact Items E.G., clothing, plastic toys and toothbrush should always be discarded. (See exceptions in text.)</p>	<p>Low Value – Low Contact Items E.G., A screw driver, garden rake or other metal or hard material item may be cleaned in some circumstances.</p>

Household contents and guidance for their disposition are listed below. The list is not exhaustive. Recommendations for household contents are divided into three categories: *Always Discard* and *Disposal Strongly Recommended* and *Disposal Recommended*.

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- **Infants' and Small Children's Clothes, Toys and Personal Items:**

Always Discard.

Exceptions: Metal or other hard medical devices such as glasses or orthopedic devices that can be cleaned may be exempted at the discretion of the local authority and in consultation with the contractor regarding remediation options.

- **Other Fabric Goods:**

- Fabric Goods: Washable

Disposal Strongly Recommended.

Exceptions: With approval of the local authority and with **reasonable assurance** that the work will be done, adult clothing and small washable fabric items such as curtains, rugs and linens can be machine-washed twice with hot water and detergent. After washing contaminated items, the washer should be run empty of clothing.

- Fabric Goods: Non-Washable, Such as Woolens, Rubber-Backed Draperies

Always Discard.

- Mattresses

Disposal Strongly Recommended.

Exceptions: (See Appendix C.4) When pre-remediation samples show low levels of meth in the structure, a mattress that is far removed from the area of cooking can be sampled to avoid disposal. The local authority must approve this action.

- Carpeting

Always Discard.

- **Kitchen Goods:**

- Dishes, Flatware, Other Hard Items, Including Glazed Ceramics, Metals and Glass
Disposal Recommended.

Exceptions: With approval of the local authority and with **reasonable assurance** that the work will be done, hard (non-porous) household items such as glazed ceramics, metals and glass may be twice-washed rinsed using detergent and hot water. Any item that shows evidence of use for meth cooking (e.g. acid etching, chemical staining) must be discarded.

- Small Wooden, All Plastic Kitchen and Household Items

Always Discard.

- **Furniture:**

- Large Wooden and other Hard Furniture Items, Including Metal, Glass and Aluminum
Disposal Recommended.

Exceptions: Attempts can be made to wash large, **hard furniture items** (e.g., non-plastic, wooden, chrome or aluminum). These items should be washed twice with detergent and hot water followed by thorough rinsing. After cleaning, wipe sample with methanol surfaces that will be touched, such as a dresser drawer face or chair seat.

- Leather or Fabric Upholstered Furniture
Disposal Strongly Recommended.
Exceptions: Irreplaceable or very high-value items may be stripped of padding and upholstery and cleaned as hard furniture. After cleaning, wipe sample with methanol surfaces that will be touched, such as a dresser drawer face or chair seat.
- Plastic Furniture and Large Plastic Goods
Always Discard.
- **Books and Household Paper Items:**

Always Discard.
Exceptions: Important legal papers, historical items or personal photographs may be exempted at the discretion of the local authority and in consultation with the contractor.
- **Appliances, Tools, and Electronics:**

Disposal Recommended.
Exceptions: At the discretion of the local authority, high-value, low-contact appliances, tools and electronics can be washed twice with a hot detergent solution and clean rinse water, or cleaned by alcohol wiping with adequate ventilation. Stained items must be discarded.
Remediation to clean an approved high-value item should include aggressive HEPA vacuuming followed by extraction shampooing or extraction steam cleaning, washing, or other method approved by the local authority. After cleaning, micro-vacuum samples from an exposed horizontal surface of the piece must demonstrate **less than 10 µg meth per square foot (<10 µg/ft²)** of the exposed surface on items that have low contact potential for children, e.g., appliances, tools.

Following removal of room contents, **HEPA vacuuming** is mandatory to remove residual contaminated dust from floors under removed carpeting. HEPA vacuuming may also be useful to reduce contamination on and in raw wood, concrete and other porous surfaces but is very time-consuming and is not required.

G. Structural Features and Surfaces

Acoustic ceiling tiles, suspended or attached, should be removed for disposal.

“Popcorn” ceilings may contain asbestos. The contractor must submit a sample of the ceiling “popcorn” for asbestos testing. If asbestos is present and the ceiling is intact, the best option is to leave the ceiling in place and seal with a sprayed-on asbestos-encapsulating product. Sealing will also satisfy meth remediation requirements. More information on asbestos abatement can be found at: <http://www.health.state.mn.us/divs/eh/asbestos/house/index.html>.

Walls, floors, and ceilings without “popcorn” texture must be double washed with hot water and detergent and rinsed with clean water to remove surface meth and prepare for painting or sealing. Washing must include frequent changes to fresh cloth rags and detergent solutions, and rinsing of the surface with clean rags and fresh water. Capture of all cleaning and rinsing solutions from the surface being cleaned is critical to remove meth. Wash waters can be disposed of in a sanitary sewer, or in a functioning septic tank/drainfield system.

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Any **wooden counter or food preparation surface** must be removed and disposed. There are no exceptions.

To avoid disposal, hard and non-textured **food preparation surfaces and counters** (stone, tile) should be washed twice with hot water detergent followed by thorough rinsing. Counter-top grout should be ground down, regouted and sealed. A post-remediation sample indicating **greater than or equal to 1 µg meth per square foot ($\geq 1 \mu\text{g}/\text{ft}^2$)** on a counter surface will indicate need for disposal.

Any **surface with stains** should be considered contaminated and removed. Staining occurs most frequently with the Red P method. However, both the anhydrous ammonia and Red P methods use corrosive agents that can cause staining or etching of surfaces.

Hard, non-porous, smooth structural furnishings such as bathtubs, mirrors, windows, and doorframes should also be washed twice with hot detergent solution and water rinsed.

Painted and unpainted **cement and cement block** may be power washed, with wash water collected. The wet vac used for collection must be decontaminated after use. Alternatively, steam clean the material with extraction of the cleaning solution.

Brick and raw wood are difficult to wet clean as the materials absorb the cleaning solutions. Oxidizing cleaners (such as oxygen bleach) cleaners may be most effective on these porous materials.

H. Encapsulation

Walls, ceilings, floors, and woodwork must be coated with paint or polyurethane after cleaning to isolate remaining meth. Apply at least two coats of high quality paint or polyurethane. A primer coat will improve adhesion of the second coat of sealant. Paint should be sprayed and not brushed or rolled. The first coat must be allowed to cure per the product recommendation before applying second and third coats. Oil, urethane, and epoxy products may provide a superior encapsulation to latex products, but these products require more care and ventilation to apply than do latex products. Glossy latex paint may provide superior encapsulation to semi-gloss or flat latex.

Sealing of **cement, raw wood, brick** or other porous materials is required in living space and recommended in other locations.

I. Plumbing and Sanitary Sewer

Meth chemicals put down the drain can be safety hazards in the plumbing system and environmental hazards in the wastewater treatment system. When corrosive or flammable chemicals have been dumped into a plumbing system, plumbing may contain concentrated chemicals in the traps of sinks and other drains. Attempting to pump out substances or remove the traps may result in chemical exposure and possible serious injury.

Sinks, bathtubs and toilets are frequently used for the disposal and dumping of lab chemicals. Visibly contaminated, stained or etched sinks, bathtubs and toilets should be discarded. Undamaged porcelain and stainless steel can otherwise be successfully cleaned.

Before cleaning plumbing fixtures, the Project Manager or Site Supervisor, equipped with chemical resistant protective disposable clothing, chemical-resistant gloves, and face-splash protection, should first thoroughly flush all plumbing traps with cold water. Every plumbing trap should then be checked with a PID or similar organic vapor meter (see *Appendix C3*). After flushing, collect substances in the trap to check pH using a long-handled tongs and cotton gauze.

Waste chemicals discarded in the sanitary sewer are typically flushed from the system within minutes or hours of the disposal. However, if the connection is on a very low flow line the chemicals could remain in the line longer. The city sewer department should be notified when city water systems may have been affected, and may want to assess conditions in the sewer lines or flush the line with water.

J. Garages, Outbuildings, and Non-Occupancy Structures

In planning remediation of contamination in non-occupancy structures, consideration should be given to the structure's use, to potential for human exposure, and to the level of contamination within that structure. For example, a contaminated child's play house (or a structure used as a child's play house) should be cleaned and painted the same as a room in a residential structure. Meth contamination in a storage shed poses far less hazard to future occupants.

The following steps should be taken in non-occupancy structures:

- Ventilate structure before cleaning.
- Inspect for stains and meth lab materials.
- Discard porous low value contents.
- When there is a dirt floor in the building, remediation must be based on assessment. In some cases, it may be necessary to scrape and dispose an inch or more of dirt floor.
- Washing options:
 - Power-wash if possible (e.g., wiring or other obstacles may make power-washing impossible).
 - When power-washing is not possible, HEPA vacuum raw wood, cement, fiberglass or concrete block.
 - With mixed materials, do a combination of these.
- Spray paint or sealant on all surfaces.

Contents within outbuildings vary in degree of human contact and ease of cleaning. If a child is not exposed to the item, or if the item is made of metal or other non-porous, hard materials, the item may be able to be cleaned. For example, a child's bicycle, a hammock, or a set of coveralls in a barn used for meth cooking could be disposed, or thoroughly cleaned as described above. High-value, low contact, hard materials, e.g., a chain saw or lathe may be wiped clean with a solvent in a well-ventilated area or outdoors.

K. Confirmation of Interior Meth Reduction

The local authority may inspect a property after remediation to verify cleaning and sealing of interior surfaces. The local authority may accept the *Contractors Report* and the appearance of new carpeting and fresh-appearing paint as evidence of carpet removal and wall/ceiling painting.

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Alternatively, a local authority may require wipe and/or micro-vacuum sampling to confirm a remediation. The local authority should choose sample locations and methods based on building material surface and porosity; location in the room and within the structure.

All remediation financed by use of the Revolving Loan Fund must be confirmed by third-party sampling (MN Stat. Sec. 446A.083, Subd. 6). Local jurisdictions may consider third-party confirmation sampling of all remediation, at their discretion or according to local ordinance.

L. Waste Characterization and Disposal

All **meth-making chemical equipment or waste**, including precursor pharmaceuticals, drug cooking or use paraphernalia, non-empty containers of potential precursor chemicals, sludges, suspicious propane cylinders or fire extinguishers, and other potential evidence must be reported to the lead criminal investigator.

The contractor or property owner may prepare **household hazardous waste** for safe transport to the local household hazardous waste (HHW) program. The contractor or property owner should contact the local HHW program for information on safe transport and pre-approval of materials from a clandestine lab property. If approval is not granted, the materials must be managed as hazardous waste.

Contaminated structural materials, household furnishings and personal property may be handled as municipal solid waste. Materials may be disposed of in a properly permitted sanitary landfill or waste-to-energy facility. All furniture, carpeting, clothing, and personal property should be cut apart or otherwise rendered unattractive to scavenging.

The gloves, cartridge respirators, protective clothing, and other **Personal Protective Equipment**, and cleaning materials used at a site may be disposed of as municipal solid waste.

Wash and rinse waters may be disposed to a municipal wastewater collection system, or into a properly functioning septic system. If the construction or performance of the septic system is unknown wash water must be containerized for disposal at a permitted wastewater facility.

All **structures that are to be demolished** in lieu of cleaning should be carefully inspected for meth lab materials and hazardous materials. Normal demolition and disposal rules apply. In all cases a property owner is responsible for assessment and proper removal and disposal of asbestos, lead, and mercury containing materials. For more details, see the "Pre-Demolition Environmental Checklist and Guide" on the MPCA website at: <http://www.pca.state.mn.us/publications/w-sw4-20.pdf>.

M. Burning a Meth-Contaminated Structure

Burning a meth-contaminated structure for fire service training in lieu of remediation is strongly discouraged. Safety of firefighter entry into a former meth lab structure and effectiveness of decontamination of firefighter equipment cannot be assured. In all cases of a practice or training burn, the burn must be done in accordance with demolition and asbestos regulations. A Department of Natural Resources (DNR) burn permit must be obtained prior to a training or practice burn.

VI. EXTERIOR EVALUATION and REMEDIATION

This portion of the Guidance has been written and will be maintained by the Minnesota Pollution Control Agency. For assessment and remediation information related to the following topics, see <http://www.pca.state.mn.us/cleanup/meth.html>

- A. Groundwater
- B. Wells
- C. Surface Water
- D. Burn Pits, Burial Pits, and Other Disposal Sites
- E. Media Assessment and Documentation
- F. Contaminated Soil Disposal

VII. FINAL REPORT and CLEARANCE

After completion of interior and exterior assessment and remediation, the contractor must verify to the property owner and the local authority that the work was completed according to MDH guidance. That verification must be provided within five days from the completion of the work.

The final report must provide documentation of decisions made and work completed, including any receipts, laboratory reports, photographs, site maps and diagrams required by the local authority.

The work at a site is not considered closed until the local authority has approved the final report.

If the work was not completed in accordance to the guidance, the contractor is liable to the property owner for additional remediation costs and attorney fees for six years after verification.

At the time that a clandestine lab is discovered, the local authority is required to “record with the county recorder or registrar of titles an affidavit with property owner name, property description and a map showing the location, condition, and circumstances of the clandestine lab.” A second affidavit may be filed when the remediation is complete.

Finally, before signing an agreement to sell or transfer the property, the seller must disclose in writing to the buyer that the property has been a meth lab or dump site and must disclose the status of the remediation.

Glossary

(As it pertains to Methamphetamine Guidance Documents)

Absorption: The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acidic: The condition of any media that contains a sufficient amount of acid substances to lower the pH below 7.0.

Acute Effect: An immediate response to a contaminant that may consist of shortness of breath, cough, chest pain, dizziness, lack of coordination, chemical irritation, and burns to the skin, eyes, mouth and nose, and in severe cases, death.

Acute Exposure: An exposure over a relatively short period of time (minutes, hours) that may result in health effects. An acute exposure to high levels of contaminants found in methamphetamine labs may cause acute effects, which can occur during or immediately after a drug bust, before the lab has been properly ventilated. Also, latent effects may occur following acute exposure.

Adverse Health Effect: A change in body function or cell structure that might indicate or lead to disease or health problems.

Air Hose: Tubing used to transport air.

Ambient Air: Any unconfined portion of the atmosphere: open air, surrounding air.

Amphetamines: Amphetamines are stimulants or "uppers" – which can be manufactured in legal and illegal labs. Amphetamines stimulate the users central nervous system with a sense of well-being and higher energy, resulting in social inhibitions and feelings of cleverness, competence and power. The term "amphetamine" refers to a large class of stimulants: amphetamines (black beauties, white bennies), dextroamphetamines (dexies, beans), and methamphetamines (crank, meth, crystal, speed). They can be taken orally, injected, smoked, or snorted. Chronic use can cause paranoia, picking at the skin, auditory and visual hallucinations, and extremely violent and erratic behavior. Amphetamines are addictive.

Anhydrous ammonia: A chemical extensively used as farm fertilizer but is also an ingredient in the production of meth, which can cause severe chemical burns on the skin.

Asbestos: Material used for fireproofing, electrical insulation, building materials, brake linings, and chemical filters; the material is used to insulate homes and it can be very dangerous to your health if disturbed.

Background Level: An average or expected amount of a substance in a specific environment, or typical amounts of substances that occur naturally in an environment. Methamphetamine is not a naturally occurring substance and the background level in a residence should be zero if no manufacturing or smoking of the substance happened at the residence.

Chronic Exposure: Chronic exposure occurs over an extended period of time, such as months or years. A chronic health effect is one that usually appears after a lengthy period of time, possibly years. Not much is known about the chronic health effects from these labs. However, there is scientific evidence from animal and human toxicity studies that shows the chemicals used in the manufacture of this drug can cause a range of health effects. These include cancer, damage to the brain, liver and kidneys, birth defects, and reproductive problems, such as miscarriages.

Clandestine Drug Lab Operation: The unlawful manufacture or attempt to manufacture a controlled substance within any area of a structure such as a dwelling, building, motor vehicle, trailer, boat, or other appliance.

Clandestine Drug Lab Site: Any part(s) of a structure such as a dwelling, building, motor vehicle, trailer, or appliance occupied or affected by conditions and/or chemicals, typically associated with a clandestine drug lab operation.

Cleanup: Proper removal and/or containment of substances hazardous to humans and/or the environment at a chemical investigation site. Cleanup refers to two specific parts: **Removal** occurs when a meth lab is identified and seized by law enforcement, and bulk chemicals, equipment and wastes are removed by a hazardous waste contractor under contract with the DEA or paid by a local agency. **Remediation** refers to the cleaning and containment of residual contamination that exists after the bulk *removal* of chemicals and chemical wastes.

Concentration: Amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Confined Space: A space that is large enough and so arranged that an individual can physically enter and perform assigned work, and has limited or restricted means of entry or exit, and is not designed for human occupancy.

A Permit Required Confined Space:

- has or may have the potential to develop a hazardous atmosphere, or
- contains materials that could engulf entrants, or
- has shape that may entrap entrants, or
- contains any serious safety or health hazards.

Contaminant: A substance that is either present in an environment where it does not belong or is present at levels that might cause adverse health effects.

Controlled Substance: A drug, substance, or immediate precursor in Schedule I.

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Cook: A slang term for the process of manufacturing methamphetamine and other illegal substances or the person(s) responsible for manufacturing methamphetamine or other illegal substance.

Corrosive: A substance having the capability or tendency to deteriorate metals by oxidation or chemical action. Chemicals used in the manufacturing of methamphetamine may be corrosive in nature.

Drug Enforcement Agency (DEA).

Dermal Contact: Touching of/by the skin.

Encapsulation: Act of surrounding, protecting and/or sheathing a building material, by applying paint or other sealant. This process is part of the remediation aspect of the cleanup.

EPA: United States Environmental Protection Agency (USEPA).

Exposure: Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be acute or chronic.

Exposure Pathway: The route a substance takes from its source to the affected area, and how people can come into contact.

Flammable: Ability of a substance to easily ignite or burn rapidly.

Groundwater: Water beneath the earth's surface in the spaces between soil particles and between rock surfaces.

Hazard: A source of potential harm from past, current, or future exposures.

Hazardous Waste: Potentially harmful substances that have been released or discarded into the environment.

Hazardous Waste Operator (HAZWOPER) training: A 40-hour course required by OSHA to enter and work within an area defined as a hazardous waste site. Cleanup contractors are required to obtain this training and update it annually prior to entering a lab.

Heating, ventilation and air conditioning system (HVAC):

High-efficiency Particulate Air (HEPA) Filtration System.

Ingestion: The act of swallowing.

Inhalation: The act of breathing.

Latent Health Effect: A disease or an injury that happens as a result of exposures that occurred in the past.

Licensed Facility: Facility, residential or non-residential: hotel, motel, mobile home park, restaurant, grocery store, child or adult foster care facilities, etc.

Methamphetamine (Meth): Methamphetamine is a member of the amphetamine family. It is highly addictive and is associated with more severe health effects than other amphetamines.

Minnesota Bureau Of Criminal Apprehension (BCA).

Minnesota Department of Health (MDH).

Minnesota Pollution Control Agency (MPCA).

Neutralization: The act of rendering a substance neutral (pH = 7.0).

Non-porous: Material that does not contain holes or pores, usually a hard surface.

Non-volatile: Substances that do not readily evaporate at normal temperatures and/or pressures.

Occupational Safety and Health Agency (OSHA).

Owner: Any person, firm, or corporation who owns, in whole or in part, the land and/or structures such as buildings, motor vehicle, trailer, boat or other appliance at a clandestine drug lab site.

Parts per million (ppm): A unit of concentration of a measured substance, which is equal to 1 mg/L of water.

Personal Protection Equipment (PPE): Specific equipment used to protect the wearer from the hazards involved with the removal and remediation of methamphetamine and other chemicals found at a clandestine drug lab/site.

pH Paper: Sampling device used to test acidity of a solution, powder or residue.

Photoionization detector (PID): A device used for the detection of VOCs, which utilizes ultraviolet light to ionize gas molecules.

Population: A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Porous: Material that contains holes or pores.

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Precursor: A substance from which another substance is formed. In meth-related areas, precursors are any compounds or mixtures containing ephedrine or pseudoephedrine. Those two drugs are precursors to methamphetamine.

Private, residential property: Single family home, apartment or multiple family unit or dwelling.

Public Health Nuisance: Pursuant to Minnesota Statute 145A.02, Subdivision 17, any activity or failure to act that adversely affects the public health.

Red phosphorus: Ingredient that can be used in the manufacture of meth; the strike plate on a book of matches is a frequently used source of red phosphorus.

Release: The spilling, leaking, or discharging of a hazardous substance into the air, soil or surface or ground water.

Remediation: The removal or neutralizing of residues and chemicals from a clandestine drug lab. Remediation may require some or all of the following steps: assessment, evaluation, testing, venting, detergent scrubbing, encapsulation, and/or demolition.

Removal: The act of elimination, transfer or withdrawal of a substance from a location.

Residues: Contamination that remains at a site after cleanup has been completed. Contaminants may be left behind at a site if the concentrations are too low to cause harm, or if it is not cost-effective to remove all of the contaminants and the risks are deemed minimal.

Respirator: A device designed to protect the wearer from inhalation of harmful atmospheres or air containing harmful chemicals and particulates. Respirators are required upon initial entrance into a clandestine drug lab.

Risk: The probability that something may cause injury or harm.

Route of Exposure: Way people come into contact with a hazardous substance. Three common routes of environmental exposure are inhalation, ingestion, or dermal contact.

Sample: A portion or piece of a whole. For example, in a study of people, the sample is a number of people chosen from a population.

Semi-volatile: Substances that slowly evaporate at normal temperatures and/or pressures.

Septic System: A small scale, typically private waste management system. Most often used for homes/facilities in rural areas, the system usually contains a settling tank and a drainfield, which may cause groundwater contamination if not working properly.

Solvent: A liquid capable of dissolving or dispersing another substance (for example, acetone, methanol or mineral spirits). Exposure to solvents can irritate the skin, mucous membranes, respiratory tract, and cause adverse effects on the central nervous system.

Source of Contamination: The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination may be the first part of an exposure pathway.

Sources of Airborne Particulates include dust, combustion products associated with motor vehicle or non-road engine exhausts, emissions from industrial processes, combustion products from the burning of wood and coal, and reactions of gases in the atmosphere.

Structure: A dwelling, building, motor vehicle, trailer, boat or other appliance.

Non-occupied (Non-occupancy) Structure: A structure, where occupants will not be exposed to substances due to the open-aired design of the structure or the inability to stay for long durations within the structure. These structures include but are not limited to barns, pole barns, silos and chicken coops.

Occupied (Occupancy) Structure: A structure, where occupants inhabit for an indeterminate amount of time as to where they would be exposed to substances. These structures include but are not limited to a residential structure, such as a house, apartment, hotel room or manufactured home; a children's fort or playhouse; daycare center; nursing home; supermarket; or gas station. Any structure that is attached to an occupancy structure is considered part of that structure. Any structure that, in the future, might be converted to an occupancy structure should be cleaned as such.

Substance: A material of a particular kind or chemical constitution that is deemed harmful and usually subject to legal restriction.

Surface Water: Water on the surface of the earth, such as in lakes, rivers, streams and ponds.

Surrogate: A substitute.

Toxic Agent: Chemical or physical (for example, radiation, heat, cold, microwaves) agents, which under certain circumstances of exposure, may cause adverse health effects to living organisms.

Vapor: The gaseous phase of a substance that is normally liquid or solid. Some hazardous substances can vaporize (become vapor) while in the soil or groundwater, filling air spaces in the soil or intruding into overlying buildings.

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Ventilation: To circulate air, typically replacing stale or noxious air with fresh air. This is a viable first step in the remediation process.

Volatile: Evaporating readily at normal temperatures and pressures. Volatile substances can be readily vaporized.

Volatile Organic Compounds (VOCs): Organic compounds that evaporate readily into the air. VOCs include substances such as benzene and toluene, which can be used in the manufacturing of methamphetamine.

Appendices

- Appendix A** **Methamphetamine Manufacturing Process and Common Manufacturing Chemicals**
- Appendix B** **Contractor Qualifications, Equipment Needs and Right-To-Know Information**
- Appendix C** **Sampling Protocols and Guidance**
- C.1 Methamphetamine Wipe Sampling Procedure
 - C.2 Vacuum Sampling to Determine Presence of Meth
 - C.3 pH and VOC Sampling Procedures
 - C.4 Indoor Sampling and Risk Decisions
- Appendix D** **Laboratory On-Site Inspection List**
- Appendix E** **Soil, Burn Pile and Burial Pit Screening**
<http://www.pca.state.mn.us/cleanup/meth.html>

Appendix A Methamphetamine Manufacturing and Common Manufacturing Chemicals

In Minnesota, the majority of known methamphetamine labs have used the Anhydrous Ammonia method (See **Figure A, Methamphetamine Manufacturing Processes**). These labs are able to produce small quantities of meth in a short period of time, earning these operations the name "user labs". This process involves the extraction of ephedrine or pseudoephedrine from various pharmaceutical products with organic solvents. Once extracted, the ephedrine and/or pseudoephedrine is reduced using lithium or sodium metal in anhydrous ammonia to create methamphetamine base. Subsequent acidification with hydrochloric acid generates the desired methamphetamine-hydrochloride (HCl) product – a process referred to as "salting out".

Specific hazards presented by an anhydrous ammonia lab while cooking include flammability, irritation, toxicity, and oxygen deprivation created by the concentrated ammonia atmospheres. In addition, lithium and sodium metals are extremely corrosive and react violently with water resulting in a fire or explosion.

The other common method is the Red Phosphorous method (commonly called the "Red P" method). This production method also uses extracted ephedrine or pseudoephedrine as their chemical precursor. However in this method, the reduction of ephedrine/pseudoephedrine occurs through a series of chemical substitutions using hydriodic acid and red phosphorus. Due to the nature of this chemical process, the "Red P" method often generates more side products and impurities that increase the production hazards. Like the anhydrous ammonia method, the final methamphetamine-HCl collection step involves a "salting out" process with hydrogen chloride gas.

Specific hazards presented by a "Red P" lab while cooking include the production of phosphine gas which is flammable, explosive, and a respiratory tract irritant, the risk of red phosphorus converting to yellow (or white) phosphorus which can ignite spontaneously in moist air, and the acutely corrosive atmospheres due to the use of acids and sodium hydroxide.

The "cooking" of methamphetamine (meth) can involve a large variety of chemical reagents depending on the specific method of manufacture. In general, the process involves precursor reagents, organic solvents, and reactive reagents that facilitate the conversion of the precursor into methamphetamine. The chemicals used are typically purchased, stolen, or illegally manufactured. Even though many of these chemicals are commonly found in households and can be "safe" if used appropriately, their inherent dangers are exacerbated when used inappropriately or in combination with other chemicals during the meth production process. Improper storage and disposal of these chemicals and mixtures also creates hazards.

Exposures and health concerns are greatest during the cooking processes. The levels of airborne chemicals vary greatly with the different cooking methods, the specific chemicals used, the scale of the production, the size of the room or structure, and the ventilation of the cooking area. General concerns include the risk of fires or explosions due to usage of flammable solvents, respiratory difficulties from breathing toxic or corrosive vapors, and skin irritations from strongly acidic and basic solutions. Chronic exposure to methamphetamine production may cause long-term health problems. Drug paraphernalia such as needles present possible exposure to infectious agents such as HIV and Hepatitis B.

After the cooking process has stopped, most of the hazards decrease. In addition, proper removal of the production wastes and bulk chemical supplies eliminates many of the risks

associated with clandestine methamphetamine labs. Volatile chemicals and solvents such as ammonia, methanol, ether, or acetone will move into air and will be readily removed from the structure by ventilation.

However, some residual contamination created from repeated "cooks" can persist long after all production has ceased. Semi- or non-volatile production chemicals such as acids, bases, and other corrosives, precursor chemicals, and products used or created in the manufacturing processes are more persistent. These residual chemicals can be volatilized or aerosolized during the cooking process and deposit on surfaces and in materials (such as carpeting, fabrics, and building structure materials). Methamphetamine can be found on most surfaces, building materials, and home furnishings of a clandestine lab.

At this time, it is unknown if methamphetamine re-volatizes to vapor after the initial deposition. Methamphetamine and other fine particle contaminants can be aerosolized and dispersed throughout the former lab.

Refer to **Table A, Meth Production Chemicals Present in Active and Former Meth Labs** (below) for comparison of active meth lab dangers to residual contaminants remaining after meth production ceases.

Regarding **Table A**:

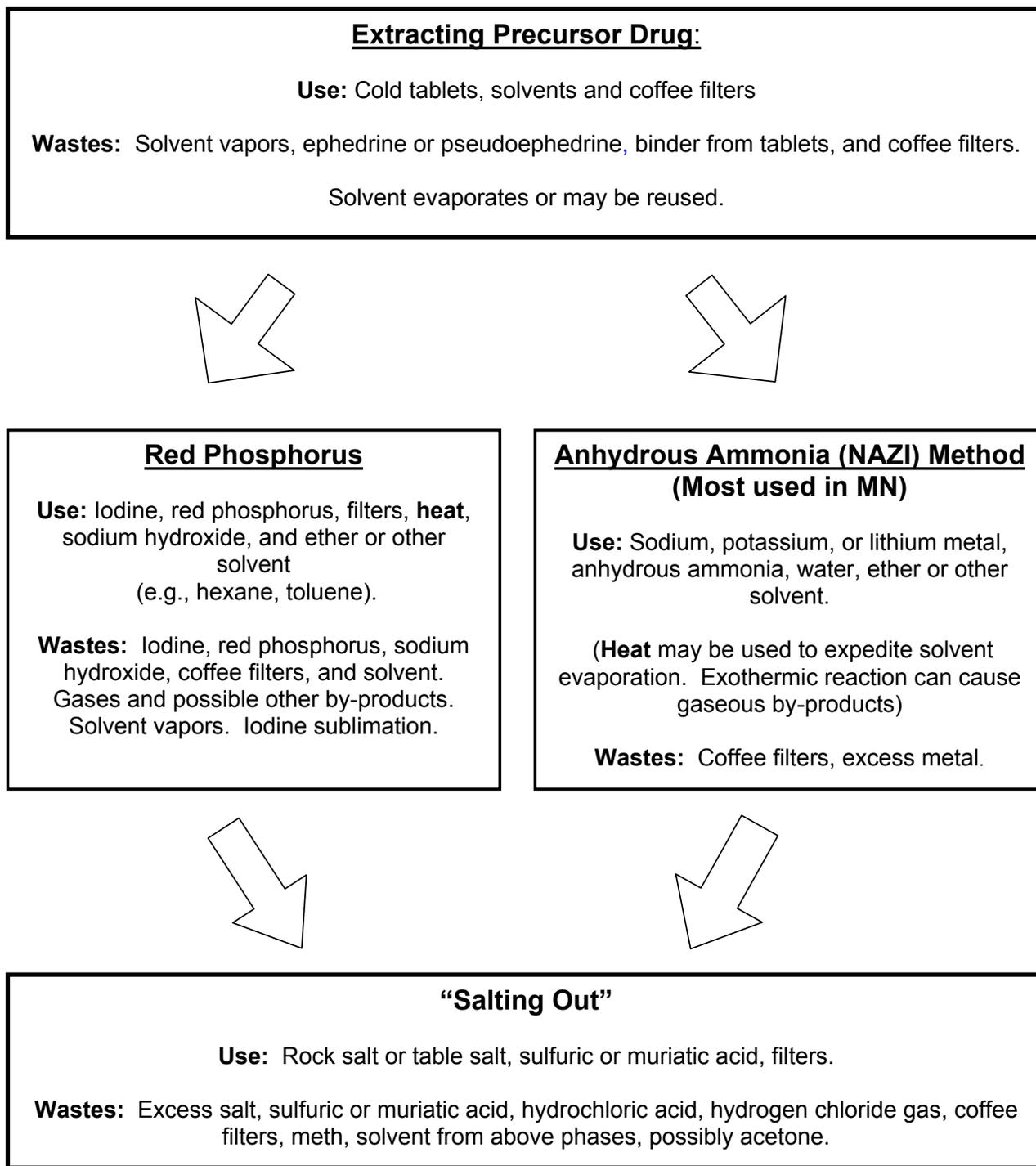
- The former meth lab environment is much less hazardous than the active lab environment. As indicated in the last column, the solvents have dissipated and the reactive materials have been mostly reduced or depleted; existence of either is far less in the former meth lab than in an active meth lab.
- Not all the chemicals listed in Table A will be found in every meth lab. Reaction materials used depend upon the method of production. The solvent(s) used in each cooking process may vary due to availability, cook's preference, etc.

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Table A. Meth Production Chemicals Present in Active and Former Meth Labs

	<u>Chemical</u>	<u>Common Sources</u>	<u>Properties of Chemicals in Active Meth Labs</u>	<u>Presence of Residual Contamination in Former Meth Lab</u>	
Precursor Reagents	Pseudoephedrine	Cold Medicine	Irritant, stimulant	Yes	
	Ephedrine	Cold Medicine	Irritant, stimulant	Yes	
Extraction / Reaction Solvents	Acetone	Fingernail polish remover	Volatile irritant, flammable	No	
	Benzene	Thinners, lacquers	Volatile irritant, flammable	No	
	Ethanol	Grain alcohol	Volatile irritant, flammable	No	
	Ether	Starter fluid	Volatile irritant, flammable	No	
	Freon	Refrigerant	Volatile irritant	No	
	Hexane	Thinners, lacquers	Volatile irritant, flammable	No	
	Isopropanol	Rubbing alcohol	Volatile irritant, flammable	No	
	Methanol	Gasoline additives, Heet	Volatile irritant, flammable	No	
	Petroleum Distillates	Mineral Salts	Volatile irritant, flammable	No	
	Toluene	Toluol	Volatile irritant, flammable	No	
	Trichloroethane	Gun cleaning solvent	Volatile irritant	No	
Reaction Materials	Sodium Hydroxide	Lye, Drain cleaner	Corrosive	Yes	
	Hydrochloric Acid	Muriatic Acid, Concrete cleaner	Corrosive	Yes	
	Sulfuric Acid	Battery Acid Drain cleaner	Corrosive	Yes	
	Red P Method Specific				
	Iodine	Antiseptic, Tincture of Iodine	Inhalation irritant	Staining	
	Red Phosphorus	Matchbook strikers, flares	Flammable and explosive	No	
	Hydriodic Acid			Yes	
	Anhydrous Ammonia Method Specific				
	Anhydrous Ammonia	Fertilizer	Corrosive	No	
	Lithium Metal	Lithium batteries	Corrosive, Explosive with H ₂ O	No	
Sodium Metal		Corrosive, Explosive with H ₂ O	No		
Production Side Products and Contaminants	Solid Waste		Misc. health hazards	No	
	Solvent Mixtures		Volatile irritant, flammable	No	
	Red P Method Specific				
	Phosphine Gas		Toxic gas, Explosive with air	No	
	Phosphorous Acid		Irritant	Yes	
	Iodine Vapor		Inhalation irritant	Staining	
	Hydriodic Acid		Corrosive	Yes	
	Anhydrous Ammonia Method Specific				
	Ammonia Vapor		Corrosive	No	
	Lithium Hydroxide		Corrosive	Yes	
Sodium Hydroxide		Corrosive	Yes		

Figure A: Methamphetamine Manufacturing Processes



Appendix B: Contractor Qualifications and Information

The Minnesota Department of Health (MDH) does not have the authority to qualify companies to conduct the cleanup of clandestine drug labs (CDLs). MDH does not license, permit or recommend cleanup contractors; however, due to the hazardous materials associated with the manufacturing of methamphetamine, CDLs are considered to be uncontrolled hazardous waste sites per Code of Federal Regulations (CFR) 1910.120. It is the contractor's responsibility to know and follow the requirements set forth by CFR 1910.120 and all other applicable regulations. Any company contracted to remediate former CDLs shall meet the following requirements. This list of requirements is not an all-inclusive list and is a guide for the County and/or Local Authority and the property owners, who are not familiar with CFR 1910.120.

Note: The contractor's project manager and/or site supervisor and general site workers will do a variety of tasks, each requiring different levels of training, expertise, and personal protective equipment.

Project Manager and/or Site Supervisor shall have the following qualifications:

- A four-year degree in either a science or engineering discipline and/or a professional registration or certification as a Professional Engineer (PE), Certified Industrial Hygienist (CIH), Certified Safety Planner (CSP) or a Certified Hazardous Materials Manager (CHMM), etc.
- The 40 Hour HAZWOPER training,
- The 8 Hour specialized supervisor training on such topics as, but not limited to, the employer's safety and health program and the associated employee-training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques,
- Respiratory protection,
- Confined space entry,
- Meth-related training.

The project manager and/or site supervisor and/or someone under the direct supervision of the project manager, upon initial entry, shall wear the appropriate Personnel Protective Equipment (PPE) including a respirator or other breathing apparatus (forced air or self-contained), gloves and a disposable chemical-resistant suit.

Monitoring/sampling equipment should contain, but not be limited to:

- a photoionization detector (PID) or similar device,
- pH paper,
- De-ionized water,
- Camera (for documentation),
- Ruler and masking tape or pre-fabricated template,
- Sample collection supplies including gauze pads, methanol, sample containers and cooler.

After initial assessment of the site, the site entry plan (when required by conditions such as presence of a confined space) or site safety plan shall state the appropriate PPE to be worn by all on-site employees. The project manager and/or site supervisor shall create a site-specific

safety plan for each contracted remediation project. The company is required to have a safety and health program, a respiratory protection program and a medical surveillance program.

General site workers shall have the following qualifications:

- The 24 Hour HAZWOPER training; however, if the action requires the use of a Self Contained Breathing Apparatus (SCBA), the worker shall require the 40 Hour HAZWOPER training.
- Methamphetamine Right to Know delivered by the project manager and/or site supervisor

The remediation contractor shall have a contract with a vendor for disposal of waste produced in the remediation process and shall identify a vendor to conduct the analysis of test samples (if applicable to the CDL site).

Finally, the company needs to understand the complexities of a CDL. Some of the complexities include: booby traps, handling lead and mercury contamination, HVAC, sanitary systems and working at a crime scene.

The table below defines the activities required to remediate a former meth lab site, the associated personnel requirements required to perform such activities and recommendations for PPE.

Table B: Contractor Employee Training

Former Meth Lab Remediation Activity	Training required for Project Manager and Site Supervisor	Training required for worker	PPE recommended
Gross Chemical Removal, including site search for containers of chemicals and/or ammonia to remove	(This activity is done under DEA contract with HW contractors and is outside of the scope of MDH Cleanup Guidance)		
Preliminary site assessment	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene e) Confined Space		a) cartridge respirator b) disposable chemical-resistant suit c) gloves
Meth site investigation, meth sampling; no containers or ammonia present	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene e) Confined Space	n/a	a) cartridge respirator b) disposable chemical-resistant suit c) gloves
Prepare project work plan, site health and safety plan, emergency plan	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene e) Confined Space	n/a	n/a
Former Meth Lab	Training required	Training required	PPE recommended

Appendix E

Remediation Activity	for Project Manager and Site Supervisor	for worker	
Disruptive actions, e.g., carpet, sheetrock, wallpaper, or furniture removal, sanding wood, HEPA vacuuming, ceiling scraping,	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) cartridge respirator b) disposable chemical-resistant suit c) gloves d) for carpet removal, thick leather gloves and boots to prevent needle punctures.
Minimally disruptive actions, e.g., furniture removal, clothing removal, contents removal, etc.	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) Meth RTK delivered by project manager or site supervisor	a) disposable chemical-resistant suit b) gloves
Wet washing areas, washing clothes, washing contents, etc.	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) Meth RTK delivered by project manager or site supervisor	a) disposable chemical-resistant suit b) gloves
Painting/encapsulating	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) Meth RTK delivered by project manager or site supervisor b) Any job or machine specific training for specific painting tasks	a) PPE appropriate to the painting tasks
Vent/furnace cleaning	a) OSHA 40 hour b) Meth class c) Sharps/pathogen d) Hygiene	a) Meth RTK delivered by project manager or site supervisor b) Any job or machine specific training for duct cleaning tasks	a) PPE appropriate to duct cleaning tasks
Final remodeling		a) Any job or machine specific training for tasks including lead and asbestos, if applicable	a) PPE appropriate to the remodeling tasks including lead and asbestos, if applicable

Training Requirements:

- a. OSHA 40 hour = OSHA Hazardous Waste Operations and Emergency Response OSHA 24 hour = OSHA Hazardous Waste Operations and Emergency Response (29 CFR 1910.120 and 29 CFR 1926.65)
- b. Meth RTK = Meth Lab Right-to-Know training for workers and owners – Hazard Communication/ Employee Right to Know (29 CFR 1910.1200 and 29 CFR 1926.59). Meth Lab Right-to-Know training should include but is not limited to:
 - Recognition, potential for harm, and handling of common meth chemicals, biological and physical hazards;
 - Sharps and pathogen briefing; and
 - Worksite hygiene.

Meth class = Meth specific contractor training – 8 hour class on meth hazards, meth components, meth sharps and pathogens, meth hygiene, etc. This class may be in conjunction with 8 hour refresher training; may be a certification class from another state; or may be a meth-specific class delivered in Minnesota, so long as the class covers the required topics and is delivered by a trainer with meth lab experience.

- c. Sharps/pathogen = Blood borne Pathogens instruction (29 CFR 1910.1030)
- d. Hygiene = instruction on how to avoid contact with contamination and how to wash following work and prior to eating etc.
- e. Confined Space = training requirement according to 29 CFR 1910.146

Right-to-Know Information for Post-Remediation or Single Job Workers (e.g., Plumber or Septic Worker) At a Clandestine Lab Site

The property you are entering was either the site of a drug lab where methamphetamine (meth) or another illegal drug was made, or the dumping or storage of drug-making chemicals has contaminated the property. All of the health risks from exposure to former labs and lab chemicals are not known. However, law enforcement personnel will have removed chemical containers and drug-making equipment from the site before you are allowed to enter.

We are required to provide you with the following information before you begin working:

- Information about potential for harm at former meth lab sites.
- Information about chemicals that may have been used on the site.
- Information about handling potentially contaminated material.
- A warning about any biological and/or physical hazards (including used needles or chemical containers) that you might find on the property.
- Information about proper worksite hygiene.

Potential for Harm

Former meth lab sites are classified as hazardous waste sites. Exposure to meth residues and meth-making chemicals can cause irritation of the eyes, nose, throat and mouth; tightness in the chest and lungs; muscle pain; headache; dizziness; nausea and vomiting; and visual disturbances. In addition to chemical exposures, unsanitary conditions that breed bacteria and unsafe physical conditions are also a common meth lab hazard and concern.

Law enforcement staff and cleanup contractors will have removed obvious hazards before you begin working. If you begin to feel unwell or experience any symptoms on the site, you should leave immediately and report your symptoms to the site manager.

Common Meth Lab Chemicals

Common meth lab chemicals include:

- Solvents such as acetone, ether, freon, hexane, methanol, toluene, trichloroethane, white gas and xylene
- Corrosives (acids and bases) such as anhydrous ammonia, hydrochloric acid, phosphine, sodium hydroxide (lye) and sulfuric acid (drain cleaner).
- Metal and Salts such as iodine, lithium metal, red phosphorus, yellow phosphorus, and sodium metal.

If you find any of these chemicals with original packaging or unmarked containers, or find propane tanks (often used to hold anhydrous ammonia) or any other suspicious material, leave them alone and report immediately to the site manager.

Handling Potentially Contaminated Material

Depending on the job you are doing at the site (e.g., painting, flushing plumbing or pumping the septic tank) there may be different ways of protecting yourself. For example, plumbers can wear protective goggles and gloves to protect themselves from acids and other chemicals that may have been dumped into drains and remain in traps.

All workers should wear gloves whenever possible. Also wear work boots, long sleeves and long pants. Follow the hygiene instructions at the end of this fact sheet. Any debris that you remove from the site should be handled carefully and disposed as soon as possible.

Biological and Physical Hazards

Needles and glassware are common hazards at meth labs and these items are often found in unexpected places such as heating ducts. Heavy protective gloves are recommended whenever your job requires putting your hand into an area that you cannot see. Any needles or razor blades found on the site should be immediately reported to the site manager. Also report any needle sticks or accidental cuts.

Any worker whose task puts them in contact with dangerous wiring, a possible trip-wire or other booby trap material, a confined space or other physical hazard should report that hazard right away and remove themselves from the danger.

Worksite Hygiene

Workers at a meth lab site should wear protective gloves, footwear and clothing as described above. You should never smoke, eat or drink on the site unless the site manager approves those activities. Wash your hands, face and other exposed skin frequently. Always wash just before or after you leave the site. Notify the site manager immediately if you become ill or are injured. Ask the site manager if they recommend any decontamination when you leave the site. They may recommend that you wash your boots or remove outer clothing before entering your vehicle.

I have read and understand the document and have received the proper training by the project manager or site supervisor and am clear on the potential for harm that might occur during my on-site time.

Worker's
Signature: _____ Date: _____

Site Manager's
Signature: _____ Date: _____

Appendix C.1: Methamphetamine Wipe Sampling Procedure

Wipe Sampling: Short Version

- Use one 3" x 3" general use gauze sponge (sampling wipe) per sample.
- Wear a new pair of nitrile gloves for each sampling.
- Limit Handling of wipers to avoid contamination.
- Wet the individual gauze wipe with 2 mL of methanol just before sampling.
- Wipe in a tight Z pattern within a measured 6" x 6" area.
- Because methanol will evaporate to dryness, lessening the ability to pickup meth, wipe sample the area within 5 seconds.
- Place the wipe back into the jar and close the lid immediately after wiping.

Sampling is performed to establish the presence of methamphetamine. Samples should be taken using methanol-dampened wipes. Wipes can be filters, gauze pads or swabs. (Recommended: 3-inch by 3-inch general use gauze sponge, e.g., Kendall Versalon sterile, all-purpose sponge.)

Water-dampened wipes are not approved by this guidance due to the lack of meth capture by water-dampened samples. The sampler should have clean hands and must wear gloves during each sampling event as to avoid contaminating samples. The sampling area should be a relatively dry surface. Post-remediation sampling should be performed after washing and painting or sealing of walls and surfaces.

Procedure includes:

1. Sampler puts on clean pair of gloves.
2. Sampler attaches template or measures with a ruler and marks by using tape a pre-designated sampling location or area. (Sampler should avoid touching the area within tape/template as to not disturb sampling area.) The sampler can either mark one sample at a time, or mark off all areas to be sampled within the structure at once. Photograph sample sites with an identifying reference point.
3. Replaces gloves with a clean pair of gloves.
4. Either soak the sampling wipe (filter or gauze pad) with 2mL methanol or take the wipe out of a per-soaked container. Use dampened wipe within 5 seconds of applying methanol to ensure that the wipe is damp. A dry wipe will not capture a representative meth sample.
5. Horizontally wipe the surface within the marking/template side to side in an overlapping "Z" pattern. Wipe so that the entire selected surface area is covered. End with an upward, scooping motion. Avoid wiping the marking tape or template. Fold the wipe so the sampled side is folded in.
6. Insert the wipe into the sample collection container.
7. Record the exact location, including the room and the approximate height (from the floor), date and time of the sample on the sample container, the chain of custody form and sampling notebook.
8. Discard gloves and marking tape and proceed to the next sampling location.

Appendix C.2: Vacuum Sampling to Determine Presence of Methamphetamine

Contaminant of Concern: Methamphetamine
Typical Sample Materials: Carpet, drapes, texturized upholstered furniture, porous stone (brick or cinderblock), raw wood, or any surface with accumulated dust particles.

Equipment needed:

- Area sampling pumps capable of at least 20 L/min flow rate (e. g., SKC Carpet Sampling Pump Kit).
- 37 mm cassettes equipped with glass fiber filters and backup pads.
- Flexible tubing to connect the pump to the filter cassettes.
- Small piece of tubing (1 to 2 in.) with one end cut at a 45-degree angle to be used as the "vacuum nozzle".
- Primary flow meter (e. g., SKC DC-Lite) for pump calibration.
- Field rotameter for convenient calibration checks.

General Method:

Pumps should be calibrated to approximately 20 L/min (with exact calibration flow rate recorded) before the sampling project begins. Confirmation of the calibration can be periodically checked between samples and must be confirmed at the end of the sampling project. The calibration should be performed while the tubing and type of filter cassette to be used during sampling are attached to the pump. If desired, an in-line field rotameter can be used throughout the sampling process to monitor the flow rate.

The sampling area should be measured and delineated (typically 4" x 4," or 6" x 6"). In general, visibly soiled, dusty, or heavily used areas are good choices for sampling. Perform a minimum of two passes at right angles to each other while sampling for one minute. During the sampling of softer materials, press the angled tubing nozzle firmly onto the sampling surface to agitate particles.

Avoid plugging the nozzle of the tubing as this restricts the flow and could damage the pump. Typical causes of plugging are pressing the nozzle too firmly into the sample without sufficient movement (causing a seal between the surface and the nozzle) and sucking up large, loose particles that either block the nozzle opening or buildup at the inlet to the filter cartridge.

Immediately after an individual sample has been collected, the pump should be turned off such that no extraneous material will be collected. The filter cassette should be disconnected, sealed, and labeled to prepare for transport back to the lab where chemical analysis can be completed. After all sampling has been completed, the pump exterior should be decontaminated (e.g., wiped with a 10% bleach solution). The short angled nozzle piece should be discarded. Inspect the collection hose between the filter and pump and discard if visibly contaminated.

Appendix C.3: pH and VOC Sampling Procedures

A. pH Testing Procedures:

Surface pH measurements shall be made using deionized water and pH test strips with a visual indication for a pH between 6 and 8. The pH reading shall be recorded for each sample location.

- For **horizontal surfaces**, deionized water shall be applied to the surface and allowed to stand for at least three minutes. The pH test strip shall then be placed in the water for a minimum of 30 seconds and read.
- For **vertical surfaces**, a Whatman 40 ashless filter paper or equivalent filter paper shall be wetted with deionized water and wiped over a 10 cm x 10 cm area at least five times in two perpendicular directions. The filter paper shall then be placed into a clean sample container and covered with deionized water. The filter and water shall stand for at least three minutes prior to testing. The pH test strip shall then be placed in the water for a minimum of 30 seconds and read.

pH testing shall be conducted on **at least three locations in each room** within the areas with visible contamination and within areas known to store or handle chemicals used for the clandestine drug laboratory in the residually contaminated portion of the real property.

B. VOC sampling and testing procedures:

A properly calibrated photoionization detector (PID) or flame ionization detector (FID) capable of detecting volatile organic carbons (VOCs) shall be used for testing.

- The **background concentration** of VOCs shall be obtained by testing three exterior areas outside the limits of the residually contaminated portion of the real property and in areas with no known or suspected sources of VOCs. All VOC readings shall be recorded for each sample location.
- **At least three locations in each room** of the residually contaminated portion of the real property shall be tested for VOC readings. The testing equipment probe shall be held in the sample location for at least 30 seconds to obtain a reading

All accessible **plumbing traps** shall be tested for VOCs by holding the testing equipment probe in the plumbing pipe above the trap for at least 60 seconds.

Appendix C.4: Indoor Sampling and Risk Decisions

Meth Sampling in This Guidance	
<p>Neither pre- nor post-remediation meth sampling is required when a contaminated property is remediated according to this Guidance. After several months' practical application of the January 1, 2006, document, it has become clear that some pre- or post-remediation sampling is being performed at most sites. The purpose of this Appendix is to assist with sampling decisions and the application of sampling results.</p>	
Some Common Reasons Sampling May Be Performed	
<ul style="list-style-type: none"> • Sampling is required in order to access the Revolving Loan Fund; by a bank, mortgage holder or other private entity; or by a county or municipal ordinance or authority. • A property owner or other party wishes to prove that meth residue is not present, or that meth is present at low levels, in order to avoid remediation of a structure and/or disposal of household items. • Parties wish to obtain estimates of meth residue levels in a structure or area, in order to focus remediation planning, or to make safety decisions regarding people working on a site before or during remediation. • Parties wish to compare pre- and post-remediation samples to show reduction of meth residue levels. • Parties wish to establish a record of baseline conditions after remediation. 	
Sampling Levels and Their Meaning in This Guidance	
Chemical	Interpretation and/or Action Taken
Methamphetamine <div style="border: 1px solid blue; padding: 5px; width: fit-content;"> <p>NOTE: See <i>Glossary</i> for definitions of occupancy and non-occupancy structures.</p> </div>	<ol style="list-style-type: none"> 1) Any level of methamphetamine at 1 $\mu\text{g}/\text{ft}^2$ or greater means that remediation of an occupancy structure must be completed according to Guidance. 2) Modified remediation/disposal of some household contents or some non-occupancy structures may be allowed and will be determined by the local authority with levels at: 1 to <10 $\mu\text{g}/\text{ft}^2$. The reason for adding this intermediate level is to enable the local authority: a) to allow remediation and salvaging of some household contents that would otherwise have to be discarded, b) distinguish between heavily contaminated lab sites and those that may have been peripherally involved, c) to allow for discretionary difference in remediation of occupancy and non-occupancy structures and d) to allow for special circumstances within the limits of safe practice. 3) Full remediation of structure and contents is required at levels: $\geq 10 \mu\text{g}/\text{ft}^2$.
Corrosives	Clean to: pH 6-8
Volatile Organic Compounds (solvents)	Clean to: <1 ppm total VOCs in air
Phosphorus / Iodine	Discard visibly stained material
Mercury / Lead	Notify MDH or MPCA before proceeding with remediation or assessment: <ol style="list-style-type: none"> 1) Mercury: Clean to < 0.3 $\mu\text{g}/\text{m}^3$ (0.036 ppb) in air. [IRIS Reference Concentration for Chronic Inhalation Exposure RfC] 2) Lead: Clean to < 40 $\mu\text{g}/\text{ft}^2$ wipe sample. [EPA TSCA Section 403]

Appendix E

Sampling Decisions and Limitations

Recommendations in this Guidance are based on research showing that meth moves easily throughout a structure where it is made. Therefore, a structure where meth is discovered is presumed to be contaminated throughout, though levels of contamination will vary. Decisions about taking samples, interpreting the results, and applying this information to a remediation plan are based on several factors:

- **Material To Be Sampled:** A wipe sample from a porcelain-coated appliance is not comparable to a sample from an adjoining, unpainted, concrete-block wall because residue is much more easily removed from the porcelain than from the concrete. Concrete sample levels will suggest less contamination than exists.
- **Site History:** Reliable information about the length of time a site has been accessible to meth cooking (e.g., cook has occupied hotel room for only one night) or areas of a property that have been accessible by the meth cook can provide important guidance for remediation planning.
- **Potential Site Use:** Remediation strategies will be different for a family home vs. a pole barn.
- **Proximity To Cooking Location:** Levels may be highest in cooking areas. However, it is important to note that **meth cooking areas often vary over time and may not be easily identified.**

MDH staff are available to provide technical advice and assistance regarding sampling and remediation situations and decisions. Call 651-201-4896 or 651-201-4922 or email: meth@state.mn.us

Deciding Which Structures on a Property Will Be Remediated or Sampled

Situation	Action/Requirement/Screening Level
<p>Scenario A: A lab and/or equipment and/or chemical residues are found in a non-occupancy structure.</p> <p>However, lab and/or equipment and/or chemicals are not found in occupancy structures on the same property.</p>	<p>Scenario A: Option Number 1: Complete remediation of non-occupancy structure where lab, equipment or chemical residues were found and of all unsampled occupancy structures.</p> <p>Note: If low levels of meth (1 to <10 µg/ft²) are found in non-occupancy structures, remediation may be somewhat modified at the discretion of the local authority, e.g., a shed may be power washed but not painted.</p> <p>Option Number 2: Perform remediation of non-occupancy structures where lab, equipment or chemical residues were found and sample all occupancy structures to determine what level of remediation (including none) is required.</p>
<p>Scenario B: Lab and/or equipment and/or chemical residues are found in an occupancy structure.</p> <p>Lab and/or equipment and/or chemical residues are not found in non-occupancy structures such as a shed or detached garage.</p>	<p>Scenario B: Complete remediation, of occupancy structure(s) where lab, equipment or chemical residues were found.</p> <p>Remediation of non-occupancy structures is <u>not always</u> required if neither lab nor chemicals are found. Garages or other buildings attached to an occupancy structure are considered “occupancy structures.” Remediation or assessment is recommended for any vehicle or structure that could be occupied for long periods, especially by children. The local authority, in consultation with the contractor, may require sampling of any non-occupancy structures on a property where odors or anecdotal information suggest meth-making activities have occurred in the structure, or according to their best professional judgment.</p>

Regarding Posting of Structures and Removal of Inhabitants

We assign three levels of certainty regarding potential for harm to human inhabitants of occupancy structures: 1) Contamination Known, 2) Contamination Likely, and 3) Contamination Unlikely. Recommendations for removal of residents and posting of occupancy structures are these:

- 1) **Contamination known:** Active lab, chemical storage or dumping on-site, or signs of previous cooking are found in the structure. Structure must be posted and residents removed until remediation is complete.
- 2) **Contamination likely:** Lab found in vehicle or other building. Chemicals, staining or equipment found in home and/or there is reason to believe that cooking or storage may have occurred in the past at different locations and/or residents are not believed to be reliable reporters. At discretion of local authority, structure is posted and residents removed until sampling is performed or remediation complete.
- 3) **Contamination unlikely:** Lab is found in another location on property, e.g., second home. No chemicals or evidence of cooking in occupancy structure are found. Residents are informed they may stay until sampling results indicate the need for remediation. **Immediate sampling is required in such a case.**

Deciding Which Floors/Levels/Areas of a Structure Will Be Remediated or Sampled

Situation	Action/Requirement/Screening Level
<p>Scenario A: There is strong evidence or belief that meth-making and related activities were restricted to a somewhat segregated area of a building, e.g., basement apartment or storage area of a multiple dwelling. The property owner does not wish to pay for full remediation of whole structure, so pre-remediation sampling is performed with these results:</p> <ul style="list-style-type: none"> ▪ Basement: Meth levels range from 100 to 200 µg/ft² ▪ 1st Floor: Levels lower but still ≥10 µg/ft² ▪ 2nd Floor: No meth detected. 	<p>Any level of methamphetamine at 1 µg/ft² or greater means that remediation of the structure must be completed. Procedures include: ventilation; air sampling; chemical spill remediation; disposal of porous and contaminated material; structural remediation, flushing of plumbing, HVAC cleaning, and painting of structural surfaces. Required in this case:</p> <ul style="list-style-type: none"> ▪ Basement: Full remediation and disposal. ▪ 1st floor: Full remediation and disposal. ▪ 2nd Floor: Full structural (e.g., washing and painting) remediation is required. The local authority will determine handling of household contents (e.g. high-cost, low-contact items) on a case-by-case basis.
<p>Scenario B: There is strong evidence or belief that meth making was restricted to a <u>separate, unattached building</u> on the same property as a home.</p> <p>The Guidance requires that all occupancy structures be sampled or remediated, so pre-remediation sampling is performed in the home with the following results:</p> <ul style="list-style-type: none"> ▪ Basement: No meth detected. ▪ 1st Floor: Low levels (<5 µg/ft²) found in two of three samples. ▪ 2nd Floor: Low levels (<2 µg/ft²) found in two of three samples. 	<p>Recommendations for the occupancy structure:</p> <p>Low levels in all samples may indicate meth smoking and not meth-making may have occurred. Although any level of meth at 1 µg/ft² or greater means that remediation of the structure must be completed, the absence of levels greater than 10 µg/ft² means that remediation of contents can be modified with the approval of the local authority and in consultation with the contractor.</p> <p>Other conditions, including the general state of repair, hygiene and biological contamination, as well as reliability of the occupants (e.g., likelihood that they will wash clothing if allowed to remove it) should be taken into consideration.</p>

Appendix E

Sampling and Remediation of Rooms, Objects and Materials		
To Be Sampled	Requirements/Recommendations	Interpretation / Exceptions
Structural Materials		
Room	BEST: Methanol wipe sample of a hard, impermeable and “nonporous” unwashed surface (e.g., ceiling fan blade, refrigerator top, water heater, or; enameled wall, high in the room. DEFAULT: Micro-vacuum sample.	<ol style="list-style-type: none"> 1) Sampling may indicate the presence of meth and will provide qualitative information about meth levels but will not give total mass of meth residue in any sampled material. 2) As no health-based standard exists, sampling will not tell whether detected meth residue is or isn't hazardous to an occupant of the structure. 3) A wipe sample of porous materials such as concrete block, brick, raw wood, cement or textured ceiling material does not accurately indicate that there is no contamination in the room. 4) Wipe samples taken from hard surfaces such as metal, and enameled finishes will provide a more accurate indication of meth present in the structure. 5) Post-remediation samples should be taken after surfaces are sealed or painted.
Painted drywall or plaster	Take a methanol wipe sample at chest height on wall.	
Unpainted sheetrock	Avoid sampling. Take sample from ceiling fan, appliance, doorframe, etc.	
Brick, cement, raw wood	AVOID SAMPLING. If location provides only these materials, micro-vacuum sampling of these porous, hard materials is recommended.	
Food Preparation Countertops	Food preparation surfaces and counter tops made of wood or other soft or porous materials must be removed and discarded. Hard, non-textured food preparation surfaces and counters made of granite or ceramic tile, etc. can be remediated and sampled, if they are not stained with chemicals.	<p>To sample and remediate stone and tile counter tops:</p> <ol style="list-style-type: none"> 1) Wash and rinse two times. 2) Grind down counter-top grout. 3) RegROUT and seal. 4) Post-remediation wipe sample must show <1 µg/ft² methamphetamine
“Popcorn” Ceilings	<p>“Popcorn” ceilings should be submitted for asbestos testing by a <i>Certified Asbestos Inspector</i>. If asbestos is present (or testing is not conducted) and the ceiling is intact, the best option is to leave the ceiling in place and seal with a sprayed-on asbestos-encapsulating product. Sealing will also satisfy meth remediation requirements.</p> <p>See: http://www.health.state.mn.us/divs/eh/asbestos/house/index.html for additional information about asbestos remediation and inspector certification.</p>	

To Be Sampled	Requirements/Recommendations	Interpretation / Exceptions
Household Contents		
Fabric Goods, including Rugs and Carpeting	<p>Disposal of fabric items is strongly recommended. If the property owner wishes to sample a fabric item, a piece of the material must be cut from the item and sent to a lab for analysis.</p> <p>All fabric items, including curtains, carpeting, mattresses, and upholstery should be discarded.</p> <p>All fabric items belonging to or used by infants and small children must be discarded.</p>	<p>At the discretion of the local authority, adults' clothing and other small, washable fabric items may be twice-washed with hot water and detergent, and used without sampling.</p> <p>If pre-remediation meth samples in a structure or level of a structure are between 1 to <10 $\mu\text{g}/\text{ft}^2$, salvaging of some large items (e.g. clean mattresses) <u>may</u> be approved by the local authority.</p> <p>Remediation to clear an approved, high-value, low-contact fabric item should include:</p> <ol style="list-style-type: none"> 1) Aggressive HEPA vacuuming 2) Extraction shampooing, extraction steam cleaning, washing, or other method approved. 3) Cut-sample analysis showing <10 $\mu\text{g}/\text{ft}^2$
Large, Hard Furniture Items	<p>Large, hard furniture items (e.g., non-plastic, sealed (not raw) wooden, chrome or aluminum) are presumed contaminated and can be disposed. Optionally, they can be cleaned and sampled, if approved by the local authority.</p>	<p>To clean and sample hard furniture items, do the following:</p> <ol style="list-style-type: none"> 1) Twice-wash with detergent and hot water followed by thorough rinsing. 2) After cleaning, sample surfaces that are commonly touched, such as a dresser drawer face or chair seat using methanol-dampened wipes. 3) A post-remediation meth wipe must reveal <10 $\mu\text{g}/\text{ft}^2$ or a lower level, as required by the local authority and depending on potential use.
Leather or Fabric Upholstered Furniture	<p>Leather or upholstered furniture should be discarded. Irreplaceable/costly items may be stripped of padding and upholstery and cleaned as hard furniture.</p>	
Plastic Furniture	<p>Plastic furniture should be discarded.</p>	
Appliances and Tools	<p>Stained items should be discarded.</p>	<p>At the discretion of the local authority, high-value, low-contact appliances and tools can be washed twice with a hot detergent solution and clean rinse water, or cleaned by alcohol wiping with adequate ventilation.</p>

Appendix E

To Be Sampled	Requirements/Recommendations	Interpretation / Exceptions
Dishes, flatware, other hard items, including glazed ceramics, metals and glass.	Structure contents are considered contaminated and should be discarded, particularly in a structure where cooking has occurred.	If meth sampling in the structure reveals low levels and the local authority approves, dishes, flatware, non-teflon (i.e., soft-coated, non-stick) pots and pans, and other hard, non-porous household items, including glazed ceramics, metals and glass may be twice-washed and rinsed using hot water. Any item that shows evidence of use for meth cooking (e.g. acid etching, chemical staining) must be discarded.
Other Contents	For technical advice, call 651-201-4896 or 651-201-4922 or email: meth@state.mn.us .	
Special Sampling Rules and Requirements		
To Be Sampled	VOC Sampling Requirements	Interpretation / Alternatives / Exceptions
Indoor Air	Indoor ambient air should be sampled using a Photoionization Detector (PID) before and after the remediation.	Readings greater than 1 ppm total VOCs should trigger the following steps/actions: <ol style="list-style-type: none"> 1) increased ventilation 2) possible use of PPE 3) repeated flushing (plumbing) 4) assessment to discover source of contamination 5) removal or remediation of source.
Plumbing	After plumbing is flushed, each plumbing trap and septic system drain should be tested using the PID.	
To Be Sampled	pH Sampling Requirements	Interpretation / Alternatives / Exceptions
Food Preparation Countertops	pH testing of all food preparation surfaces and chemical spills is required. To reach the acceptable range (pH 6-8): <ol style="list-style-type: none"> 1) Remove excess material: <ol style="list-style-type: none"> a) Solids can be scooped up and packaged for disposal b) Liquids can be adsorbed with clay or another non-reactive material and packaged. 2) Wash affected and adjoining surfaces: <ol style="list-style-type: none"> a) Neutralize acids with sodium bicarbonate (baking soda). b) Treat bases with weakly acidic wash solutions (e.g., vinegar, citric or acetic acid). 3) Resample after neutralization. 4) Discard badly stained or contaminated materials. 	
Stained Materials, Powders, and Liquids		
Recap: Meth Sampling Rule Of Thumb		
< 1 µg/ft ²	Range of Action: No Action Required.	
1 to <10 µg/ft ²	Range of Action: <ul style="list-style-type: none"> ▪ Full Remediation of Occupancy Structures Required ▪ Modified Remediation May Be Allowed in Non-Occupancy Structures ▪ Modified Remediation/Disposal of Contents May Be Allowed 	
>10 µg/ft ²	Range of Action: Full-Remediation of Structure and Contents Required	

Appendix D: Laboratory On-Site Inspection Checklist



Minnesota Department of Health
 Environmental Laboratory Certification Program
www.health.state.mn.us/divs/phl/cert/index.html

Analyte(s): Methamphetamine, Pseudoephedrine and Ephedrine
 Matrix: Swab
 Technology: Liquid or Gas Chromatography/Mass Spectrometry
 Method: Performance-based

Criteria	Y	N	Remarks
Sample Size for Preparation			
Swabs: Gauze sponges 3"X 3" - 4 ply, rayon/polyester blend or equivalent. Note: sponges must hold (absorb) solvent and sponge matrix does not interfere with mass spectral identification.			
Sample Preparation			
Swabs: Gauze sponges are prewetted or wetted in the field. Methanol is the primary solvent.			
Isotopically labeled (e.g. D ₉) internal standards for methamphetamine and pseudoephedrine or ephedrine are added after sample collection or prior to the beginning of sample processing.			
Sample preparation procedures (e.g. extraction, mixing, filtering) are defined and identical for all samples and quality control.			
Holding Time			
Samples are extracted within 14 days.			
Samples are analyzed within 40 days of extraction.			
Method Validation-Initial Demonstration of Capability			
Each analyst has performed an initial demonstration of capability			
Detection Limits			
Detection limit is established according to criteria in regulation [40 CFR 136, Appendix B].			
Reporting Limits			
Reporting limits are established for each analyte of interest.			
Equipment and Equipment Maintenance			
Instrument is maintained per manufacturer's recommendations. Maintenance logbooks are up to date.			
Reagents and Standards, Expiration Check			
The standards are prepared in accordance with the laboratory's standard operating procedures and quality assurance manual.			

Appendix E

Criteria	Y	N	Remarks
Reagents and standards are appropriately labeled in accordance with the requirements in Minnesota Rules, Chapter 4740 (e.g. contents, date of preparation, date of expiration, identification of the preparer).			
Reagents and standards are discarded prior to expiration.			
Pre-calibration Requirements			
<p>For GC/MS: specific information is provided as to how the instrument is set up. This information must include, at a minimum:</p> <ol style="list-style-type: none"> 1) If samples are analyzed by GC/MS the mass spec tune meets acceptance criteria of 8270C method (if DFTPP is used) or the acceptance criteria as defined by the laboratory. 2) The mass spec tune meets acceptance criteria prior to analysis and every 12 hours. 3) Analyte retention times and respective acceptance windows are determined for all compounds. 4) Target ions and their relative intensities are defined for each analyte. <p>This information must be the same for all calibration curve, samples, and QC (i.e. the electron multiplier voltage for the calibration curve must be the same as that of the samples).</p>			
<p>For LC/MS, LC/MS/MS or LC/MS^{nth}: specific information is provided as to how the instrument is set up. This information must include, at a minimum:</p> <ol style="list-style-type: none"> 1) The laboratory documents the mass spectral tune results. 2) Analyte retention times and respective acceptance windows are determined for all compounds. 3) Molecular, primary fragment, secondary fragment, etc. ions (if applicable) are defined for each analyte. 4) Molecular, primary fragment, secondary fragment, etc. ions and expected primary/secondary fragment ion ratios (if applicable) are defined along with acceptance criteria. <p>This information must be the same for all calibration curve, samples, and QC (i.e. the electron multiplier voltage for the calibration curve must be the same as that of the samples).</p>			
Initial Calibration Requirements and Linear Range			
The calibration curve is constructed of at least five standards. Concentrations of the standards are recorded.			
The lowest standard in the curve is at or below the reporting limit of the compounds.			
The criteria for acceptance of the initial calibration curve is defined.			
Acceptance criteria for internal standard abundances are defined.			

Criteria	Y	N	Remarks
Calibration Verification Requirements			
At least two continuing calibration verification (CCV) standards will be analyzed prior to sample analysis. One of the CCV standard mixes must be at or below the report level of the analytes of interest. Acceptance limits and abundance criteria must be documented for the CCV standards. Continuing calibration verification must occur prior to batch analysis and every 12 hours.			
Procedure			
Retention times of the target compounds are within 0.06 relative retention time units of the measured standard reference compounds.			
For GC/MS: 1) All ions present in the standard mass spectrum at a relative intensity greater than 10 percent must be present in the sample spectrum. 2) The relative intensities of the ions in (1) above must agree within ± 20 percent between the standard and sample spectrum.			
For LC/MS, LC/MS/MS or LC/MS^{nth}: 1) All ions (e.g. molecular, primary fragment, secondary fragment, etc.) monitored in the standard mass spectrum must be present in the sample spectrum. 2) The relative intensities of the ion ratios (e.g. primary/secondary fragment ion ratio) in (1) above must agree within ± 30 percent between the standard and sample spectrum.			
QC Accuracy			
A Quality Control Sample (QCS) or solution of target analytes of known concentration obtained from a second source or from a different lot number from the calibration solutions is analyzed with each calibration curve or quarterly (whichever is more frequent). Acceptance limits are defined for the QCS.			
Midlevel continuing calibration check standard containing each compound is analyzed every batch or every 20 samples, whichever is most frequent			
When the values for external reference standards fall outside the acceptance range established by in-house limits, appropriate corrective action is taken.			
QC Precision			
An LCS and LCSD (spike two clean gauze sponges with a known amount of the compounds and analyze each separately) are analyzed per batch or every 20 samples, whichever is most frequent.			
Acceptance criteria for laboratory control spikes are defined.			

Appendix E

Criteria	Y	N	Remarks
Spiking concentration is reasonable to the concentrations present in the calibration curve.			
At least one duplicate is run as part of every analysis set.			
At least ten percent of all samples are run in duplicate. Acceptance limits are defined for the duplicate samples.			
QC Blanks			
At least one method blank is included in each preparation batch. Acceptance limits are defined for the method blank.			
Calculations			
Quantitation is based on the internal standard technique.			
All samples are diluted and re-analyzed if the measured concentration is above the highest calibration level.			
Because pseudoephedrine and ephedrine are stereo isomers they are reported as an isomeric pair.			
Report to Client			
Reports to the client include the date the sample was analyzed.			
Reports to the client include a reference to the method used.			
Reports to the client include the unique sample identification used by the laboratory.			
Reports to the client include the units of measurement.			
Reports to the client indicate any deviation from the specified procedures.			
Laboratory Documentation			
Because this is a PBMS method, the laboratory must have a specific corrective action policy for each area of the analysis when the laboratory's defined criteria are not met.			
The laboratory's actual practice conforms to the current standard operating procedure on file.			

