CLANDESTINE DRUG LAB REMEDIATION
The Training Manual for Professional Environmental Decontamination Specialists

Second Edition

Publisher: NATIONAL INSTITUTE OF DECONTAMINATION SPECIALISTS

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Comment [1]: The first thing we want to point out is that Berg is claiming copyright protection here. Note that he calls himself the "owner."

This means Berg is declaring to the world that he wrote the materials in this "book" unless he specifically gives another author or source credit.

He strictly forbids reproduction without his permission, which proves again he is declaring to the world that he wrote all the contents of this "book" unless he gives another credit.

In this "book" we have documented approximately 100 instances of plagiarism (theft), copyright infringement and trademark infringement.

In this document we will prove to you that Berg is a thief, a charlatan, and a fraud.

Berg has no regard for the law and and no qualms about stealing the work of others and presenting it to the world as his own.

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INTRODUCTION

Whether you are a bioreocovery technician, trauma waste practitioner, [redacted]

[redacted]

[redacted]

[redacted]

Comment [2]: Berg misspelled biorecovery here. It seems like the one word he should know how to spell.

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 substance 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 bums 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 bums 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

Comment [3]: This is a generic glossary. This is obviously not written by Berg.

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.

Chain-of-Custody: The procedure by which the custody of a sample is documented from its source of collection to the analytical laboratory.

Characterize: Determining the properties of an item based on the amount of contaminants found in testing or by its inherent properties (i.e. flammable).

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.

Combustible: Vapor concentration from a liquid that has a flash point greater than 100 degrees F.

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 1.

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 to 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.

FID: Flame Ionization Detector

Flammable: Ability of a substance to easily ignite or bum rapidly.

GC/MS: Gas Chromatograph/Mass Spectrometer.

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):

HEPA High-efficiency Particulate Air (HEPA) Filtration System.

Highly Suggestive of Contamination: Visible or olfactory indication of contamination, or locations within 10 feet of areas where hazardous substances were stored or used to manufacture illegal drugs and could likely be contaminated with hazardous substances, unless separated by a full-height, non-porous wall with no

openmgs.
Impacted groundwater: Sub-surface water that contains hazardous or petrochemical substances at levels above background concentrations.
Impacted soil: Soil that contains hazardous or petrochemical substances at levels above background concentrations.
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.
LEL/02: Lower Explosive Limit/ Oxygen substances can be readily vaporized.
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.
Neutralization: The act of rendering a substance neutral (pH = 7.0).
Non-porous: Material that does not contain holes or pores for foreign materials, liquids or vapors to be trapped in or pass through. 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 I mg/L of water.
Personal Protection Equipment (PPE): Specific equipment such as boots, gloves, suits and respirators 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.
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.

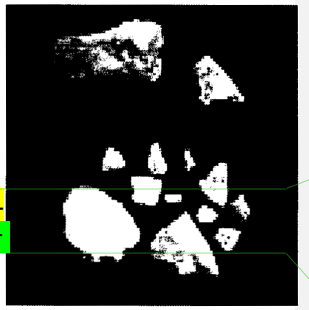
Private, residential property: Single family home, apartment or multiple family unit or dwelling.
Public Health Nuisance: Pursuant to Minnesota Statute 145A.02, Subdivision 17, any activity or failure to act that adversely affects the public health.
Red phosphorus: Ingredient that can be used in the 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 in order to restore an item or area to a healthy state.
. 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 con-

tamination 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 inhibit 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.
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
Volatile Organic Compounds (VOCs): Organic compounds that evaporate readily into the air at ambient temperatures.
VOCs include substances such as benzene and toluene, which can be used in the manufacturing of methamphetamine.

Comment [4]: End of generic glossary.

METHAMPHETAMINE

Product Background



Methamphetamine is generally found in two forms. "Crystal Meth" is a colorless, odorless form of d-methamphetamine, a powerful stimulant. It resembles glass fragments or shiny blue-white "rocks" of various sizes. The other form, Methamphetamine Hydrochloride is a white, odorless, bitter-tasting, crystalline powder that dissolves in water or alcohol. Street names for the drug include batu, crystal, glass, hiropon, meth, speed, chalk, christy, stovetop, crank. tire. ice. Shabu, shards, tina, venana, and vidrio.

Crystal meth and powdered meth both contain the same active chemical compound; however, crystal meth typically has a higher purity level and may produce longer-lasting, more intense physiological effects. In small doses meth can heighten alertness, stimulate physical activity, and suppress appetite. Chronic abuse can cause psychotic and violent behavior characterized by intense paranoia, visual and auditory hallucinations, and out-of-control rages.

Crystal meth is often compared to crack cocaine. The drugs produce similar physiological effects, are highly addictive, and typically are smoked. Crystal meth also may be injected, snorted or orally ingested. Immediately after smoking or injecting crystal methamphetamine, abusers experience a brief, intense sensation, or rush, that is followed by a high that may last 12 hours or more. Effects of usage include addiction, psychotic behavior, and brain damage. Chronic use can cause violent behavior, anxiety, confusion, insomnia, auditory hallucinations, mood disturbances, delusions, and paranoia. Users, [redacted]

The production, use and sale of rnethamphetarnine continue to be a growing problem in the United States. While the use and sale of "meth" creates serious social and economic problems, the production of "meth" creates a serious environmental problem for our country. Methamphetamine production methods are often crude and extremely dangerous. Precursors, reagents, solvents, and waste products

Comment [5]: Plagiarized from the National Drug Intelligence Center's Information Bulletin (August 2002), Product No. 2002-L0424-005, *Crystal Methamphetamine.*

Comment [6]: Plagiarized from *Awareness Training on Methamphetamine*, written for the US Navy, August 2003.

Comment [7]: Plagiarized from the National Drug Intelligence Center's Information Bulletin (August2002), Product No. 2002-L0424-005, *Crystal Methamphetamine.*

Comment [8]: Plagiarized from the National Drug Intelligence Center's Information Bulletin (August2002), Product No. 2002-L0424-005, *Crystal Methamphetamine.*

Comment [9]: Mixture of verbatim and additions from *Awareness Training on Methamphetamine*, written for the US Navy, August 2003.

found at methamphetamine laboratories and dumpsites pose risks to the long-term health of those exposed to them. 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 the air and will be readily removed from the structure by ventilation. Although law enforcement or their contractor usually handles the majority of the bulk clean up and disposal of these makeshift laboratories, contamination from semi-volatile or non-volatile production chemicals such as acids, bases, precursor chemicals, and products used or created in the manufacturing processes may be left on surfaces, absorbent materials (carpets, furniture, drapes, etc.), sinks, drains and ventilation systems.

The EPA is trying to facilitate clean up and disposal of "meth" labs by identifying r the contaminants from these laboratories. This has proved to be a complicated process because different "recipes" use different ingredient. Also, the production of "meth" can be performed in different stages at different locations. Based on preliminary findings some of the major methamphetamine related contaminants include VOC's, acids, bases, explosives, metals, iodine and phosphorous.

The potential health effects of exposure to "meth" contaminants vary depending on the specific chemicals the person is exposed to, the concentrations of the chemicals, the length of exposure and the health of the person exposed. The health risks associated with exposure to "meth" contaminants include respiratory problems, skin and eye irritation, headaches, nausea, and dizziness. Also, some VOC chemicals are either known or suspected carcinogens.

Because "meth" labs are an emerging problem there are no uniform nationwide guidelines, regulations or standards for the clean up of "meth" labs. Potential clean up plans have ranged from doing nothing to demolition of the property. Various agencies are working to develop clean up guidance and regulations that not only protect the public but also are practical and economical for property owners.

Comment [10]: Plagiarized from *The Monitor,* Vol. 4, No. 1, 2003, published by Precision Analytical Laboratories, a division of Aerotech Laboratories.

An adapted (with permission) version was printed in the Journal of Environment Health in May 2003. You can see the clear plagiarism here: http://www.thefreelibrary.com/Illegal+meth+labs%3A+cleanup+raises+health+and+environmental+concerns....-a0101577381

From NIOSH Pocket Guide to Chemical Hazards

Acetone CAS 67-64-1 (CH3)2CO RTECS AL3150000
Synonyms & Trade Names Dimethyl ketone, Ketone propane, 2-Propanone Guide 1090 127 DOT ID &
ExposureLimits NIOSH REL: TWA 250 ppm (590 mg/m3)
OSHA PELt: TWA 1000 ppm (2400 mg/m3)
IDLH 2500 ppm [10%LEL] Conversion 1 ppm = 2.38 mg/m3
Physical Description Colorless liquid with a fragrant, mint-like odor. MW: 58.1 BP: 133°F FRZ: -140°F Sol: Miscible
VP: 180 mmHg IP: 9.69 eV Sp.Gr: 0.79
Fl.P: 0°F UEL: 12.8% LEL: 2.5%
Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F. Incompatibilities & Reactivities Oxidizers, acids
Measurement Methods NIOSH 1300, 3800; OSHA 69
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact
Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respi- ratory support Swallow: Medical attention immediately
Respirator Recommendations NIOSHUp to 2500 ppm: (APF = 10) Any chemical cartridge res- pirator with organic vapor cartridge(s)*/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self- contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted or- ganic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Exposure Routes inhalation, ingestion, skin and/or eye contact
Symptoms Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis
Target Organs Eyes, skin, respiratory system, central nervous system

Comment [11]: This is the beginning of the NIOSH Pocket Guide. Obviously not written by Berg, this is an extremely rare instance where he does give proper credit. There are 21 pages of the NIOSH Pocket Guide in Berg's "book."

From NIOSH Pocket Guide to Chemical Hazards

Ammonia CAS 7664-41-7

NH3 RTECS 800875000

Synonyms & Trade Names Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.] DOT ID & Guide 1005 125 (anhydrous)2672 154 (10- 35% solution)2073 125 (>35-50% solution)1005 125 (>50% solution)

ExposureLimits NIOSH REL: TWA 25 ppm (18 mg/m3) ST 35 ppm (27 mg/m3) OSHA PELt: TWA 50 ppm (35 mg/m3)

IDLH 300 ppm Conversion 1 ppm = 0.70 mg/m3

Physical Description Colorless gas with a pungent, suffocating odor. [Note: Shipped as a lique- fied compressed gas. Easily liquefied under pressure.]

MW: 17.0 BP: -28°F FRZ: -108°F Sol: 34% VP: 8.5 atm IP: 10.18 eV RGasD: 0.60

Fl.P: NA (Gas) UEL: 28% LEL: 15%

[Note: Although NH3 does not meet the DOT definition of a Flammable Gas (for labeling pur- poses), it should be treated as one.]

Incompatibilities & Reactivities Strong oxidizers, acids, halogens, salts of silver & zinc [Note: Corrosive to copper & galvanized surfaces.]

Measurement Methods NIOSH 6015, 6016; OSHA ID188

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated (solution) Remove: When wet or contaminated (solution) Change: No recommendation Provide: Eyewash (>10%), Quick drench (>10%) First Aid (See proce- dures) Eye: Irrigate immediately (solution/liquid) Skin: Water flush immediately (solution/ liquid) Breathing: Respiratory support Swallow: Medical attention immediately (solution) Respirator Recommendations NIOSHUp to 250 ppm: (APF = 10) Any chemical cartridge respi- rator with cartridge(s) providing protection against the compound of concem*/(APF = 10) Any supplied-air respirator*Up to 300 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode*/(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concem*/(APF = 50) Any chemical cartridge res- pirator with a full facepiece and cartridge(s) providing protection against the compound of con- cern/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respi- rator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any sup- plied-air respirator that has a full facepiece and is operated in a pressure-demand or other posi- tive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of con- cern/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion (solution), skin and/or eye contact (solution/liquid) Symptoms Irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin bums, vesiculation; liquid: frostbite

Target Organs Eyes, skin, respiratory system

From NIOSH Pocket Guide to Chemical Hazards

Benzene CAS 71-43-2 C6H6 RTECS CY1400000

Synonyms & Trade Names Benzol, Phenyl hydride DOT ID & Guide 1114 130

ExposureLimits NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A OSHA PEL: [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F IDLH Ca [500 ppm] Conversion 1 ppm = 3.19 mg/m3

Physical Description Colorless to light-yellow liquid with an aromatic odor. [Note: A solid be- low 420F.]

MW: 78.1 BP: 176°F FRZ: 42°F Sol: 0.07% VP: 75 mmHg IP: 9.24 eV Sp.Gr: 0.88

Fl.P: 12°F UEL: 7.8% LEL: 1.2%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, many fluorides & perchlorates, nitric acid Measurement Methods NIOSH 1500, 1501, 3700, 3800; OSHA 12

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Pro- vide: Eyewash, Quick drench First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immedi- ately

Respirator Recommendations NIOSHAt concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing appa- ratus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self- contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canis-ter/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, blood, central nervous system, bone marrow Can- cer Site [leukemia]

From NIOSH Pocket Guide to Chemical Hazards **2-Butanone** CAS 78-93-3
CH3COCH2CH3 RTECS EL6475000
Synonyms & Trade Names Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone DOT ID & Guide 1193 1271232 127
ExposureLimits NIOSH REL: TWA 200 ppm (590 mg/m3) ST 300 ppm (885 mg/m3) OSHA PELt: TWA 200 ppm (590 mg/m3)
IDLH 3000 ppm Conversion 1 ppm = 2.95 mg/m3
Physical Description Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.
MW: 72.1 BP: 175°F FRZ: -123°F Sol: 28% VP: 78 mmHg IP: 9.54 eV Sp.Gr: 0.81
Fl.P: 16°F UEL(200°F): 11.4% LEL(200°F): 1.4%
Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Incompatibilities & Reactivities Strong oxidizers, amines, ammonia, inorganic acids, caustics, isocyanates, pyridines
Measurement Methods NIOSH 2500, 3800; OSHA 16, 84
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Pro- vide: Eyewash First Aid (See procedures) Eye: Irrigate immediately Skin: Water wash immediately Breathing: Fresh air Swallow: Medical attention immediately
Respirator Recommendations NIOSH/OSHAUp to 3000 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode£/(APF = 25) Any powered, air-purifying respira- tor with organic vapor cartridge(s)£/(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH condi- tions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied- air respirator that has a full facepiece and is operated in a pressure-demand or other positive- pressure mode in combination with an auxiliary self-contained positive-pressure breathing ap- paratusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin- style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self- contained breathing apparatus
Exposure Routes inhalation, ingestion, skin and/or eye contact
Symptoms Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis
Target Organs Eyes, skin, respiratory system, central nervous system

From NIOSH Pocket Guide to Chemical

Chlorodifluoromethane CAS 75-45-6 CHC1F2 RTECS PA6390000

Synonyms & Trade Names Difluorochloromethane, Fluorocarbon-22, Freon® 22, Genetron® 22, Monochlorodifluoromethane, Refrigerant 22 DOT ID & Guide 1018 126

ExposureLimits NIOSH REL: TWA 1000 ppm (3500 mg/m3) ST 1250 ppm (4375 mg/ m3)

OSHA PELt: none

IDLH N.D. See: IDLH INDEX Conversion 1 ppm = 3.54 mg/m3

Physical Description Colorless gas with a faint, sweetish odor. [Note: Shipped as a liquefied compressed gas.]

MW: 86.5 BP: -41°F FRZ: -231°F Sol(77°F): 0.3% RGasD: 3.11

VP: 9.4 atm IP: 12.45 LEL: NA

eV Fl.P: NA UEL: NA

Nonflammable Gas

Incompatibilities & Reactivities Alkalis, alkaline earth metals (e.g., powdered aluminum, so- dium, potassium, zinc)

Measurement Methods NIOSH 1018

Personal Protection & Sanitation Skin: Frostbite Eyes: Frostbite Wash skin: No recommenda- tion Remove: No recommendation Change: No recommendation

Provide: Frostbite First Aid (See procedures) Eye: Frostbite Skin: Frostbite Breathing: Respiratory support

Respirator Recommendations To be added later

Exposure Routes inhalation, skin and/or eye contact (liquid)

Symptoms Irritation respiratory system; confusion, drowsiness, ringing in ears; heart palpita- tions, cardiac arrhythmias; asphyxia; liver, kidney, spleen injury; liquid: frostbite

Target Organs respiratory system, cardiovascular system, central nervous system, liver, kid- neys, spleen

From NIOSH Pocket Guide to Chemical

Ethyl ether CAS 60-29-7 C2H50C2H5 RTECS KI5775000

Synonyms & Trade Names Diethyl ether, Diethyl oxide, Ethyl oxide, Ether, Solvent ether DOT ID & Guide 1155 127

ExposureLimits NIOSH REL: See Appendix D OSHA PELt: TWA 400 ppm (1200 mg/m3)

IDLH 1900 ppm [10%LEL] Conversion I ppm = 3.03 mg/m3

Physical Description Colorless liquid with a pungent, sweetish odor. [Note: A gas above 94°F.] MW: 74.1 BP: 94°F FRZ: -177°F Sol: 8%

VP: 440 mmHg IP: 9.53 eV Sp.Gr: 0.71

Fl.P: -49°F UEL: 36.0% LEL: 1.9%

Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F.

Incompatibilities & Reactivities Strong oxidizers, halogens, sulfur, sulfur compounds [Note: Tends to form explosive peroxides under influence of air and light.]

Measurement Methods NIOSH 1610; OSHA 7

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: No recommendation Remove: When wet (flammable) Change: No recommendation

First Aid (See procedures) Eye: Irrigate immediately Skin: Water wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations OSHAUp to 1900 ppm: (APF = 10) Any chemical cartridge res- pirator with organic vapor cartridge(s)*/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self- contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted or- ganic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, upper respiratory system; dizziness, drowsiness, headache, ex- cited, narcosis; nausea, vomiting

Target Organs Eyes, skin, respiratory system, central nervous system

From NIOSH Pocket Guide to Chemical

Hydrogen cyanide CAS 74-90-8 HCN RTECS MW6825000
Synonyms & Trade Names Formonitrile, Hydrocyanic acid, Prussic acid DOT ID & Guide 1051 117 (>20% solution)1051 117 (anhydrous)l613 154 (</=20% solution)
ExposureLimits NIOSH REL: ST 4.7 ppm (5 mg/m3) [skin] OSHA PELt: TWA 10 ppm (11 mg/m3) [skin]
IDLH 50 ppm Conversion 1 ppm = 1.10 mg/m3
Physical Description Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor. [Note: Often used as a 96% solution in water.]
MW: 27.0 BP: 78°F (96%) FRZ: 7°F (96%) Sol: Miscible VP: 630 mmHg IP: 13.60 eV Sp.Gr: 0.69
Fl.P: 0°F (96%) UEL: 40.0% LEL: 5.6%
Class IA Flammable Liquid Flammable Gas
Incompatibilities & Reactivities Amines, oxidizers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, caustics, ammonia [Note: Can polymerize at 122-140°F.]
Measurement Methods NIOSH 6010
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Provide: Eyewash, Quick drench First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immedi- ately
Respirator Recommendations NIOSHUp to 47 ppm: (APF = 10) Any supplied-air respiratorUp to 50 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact
Symptoms Asphyxia; lassitude (weakness, exhaustion), headache, confusion; nausea, vomiting; increased rate and depth of respiration or respiration slow and gasping; thyroid, blood changes Target Organs central nervous system, cardiovascular system, thyroid, blood

From NIOSH Pocket Guide to Chemical

Hydrogen chloride CAS 7647-01-0 HCl RTECS MW4025000

Synonyms & Trade Names Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid) [Note: Often used in an aqueous solution.] DOT ID & Guide 1050 125 (anhydrous)l 789 157 (solution)

ExposureLimits NIOSH REL: C 5 ppm (7 mg/m3) OSHA PEL: C 5 ppm (7 mg/m3)

IDLH 50 ppm Conversion 1 ppm = 1.49 mg/m3

Physical Description Colorless to slightly yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]

MW: 36.5 BP: -121°F FRZ: -174°F Sol(86°F): 67% VP: 40.5 atm IP: 12.74 eV RGasD: 1.27

Fl.P: NA UEL: NA LEL: NA

Nonflammable Gas

Incompatibilities & Reactivities Hydroxides, amines, alkalis, copper, brass, zinc [Note: Hydro- chloric acid is highly corrosive to most metals.]

Measurement Methods NIOSH 7903; OSHA IDl 74SG

Personal Protection & Sanitation Skin: Prevent skin contact (solution)/Frostbite Eyes: Prevent eye contact/Frostbite Wash skin: When contaminated (solution) Remove: When wet or con- taminated (solution) Change: No recommendation Provide: Eyewash (solution), Quick drench (solution), Frostbite First Aid (See procedures) Eye: Irrigate immediately (solution)/Frostbite Skin: Water flush immediately (solution)/Frostbite Breathing: Respiratory support Swallow: Medical attention immediately (solution)

Respirator Recommendations NIOSH/OSHAUp to 50 ppm: (APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern*/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern*/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepieceEmergency or planned entry into unknown concentrations or IDLH condi-tions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied- air respirator that has a full facepiece and is operated in a pressure-demand or other positive- pressure mode in combination with an auxiliary self-contained positive-pressure breathing ap- paratusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin- style, front- or back-mounted acid gas canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion (solution), skin and/or eye contact

Symptoms Irritation nose, throat, larynx; cough, choking; dermatitis; solution: eye, skin burns; liquid: frostbite; in animals: laryngeal spasm; pulmonary edema Target Organs Eyes, skin, respiratory system

From NIOSH Pocket Guide to Chemical

Isopropyl alcohol CAS 67-63-0 (CH3)2CHOH RTECS NT8050000

Synonyms & Trade Names Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alco- hol, Rubbing alcohol DOT ID & Guide 1219 129

ExposureLimits NIOSH REL: TWA 400 ppm (980 mg/m3) ST 500 ppm (1225 mg/m3) OSHA PELt: TWA 400 ppm (980 mg/m3)

IDLH 2000 ppm [10%LEL] Conversion 1 ppm = 2.46 mg/m3 Physical Description Colorless liquid with the odor of rubbing alcohol. MW: 60.1 BP: 181°F FRZ: -127°F Sol: Miscible

VP: 33 mmHg IP: 10.10 eV Sp.Gr: 0.79

Fl.P: 53°F UEL(200°F): 12.7% LEL: 2.0%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acids, isocyanates

Measurement Methods NIOSH 1400; OSHA 109

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory sup- port Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 2000 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode£/(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)/(APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canis- ter/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)£/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, nose, throat; drowsiness, dizziness, headache; dry cracking skin; in animals: narcosis

Target Organs Eyes, skin, respiratory system

From NIOSH Pocket Guide to Chemical

Lead CAS 7439-92-1 Pb RTECS OF7525000

Synonyms & Trade Names Lead metal, Plumbum DOT ID & Guide

ExposureLimits NIOSH REL*: TWA 0.050 mg/m3 See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]

OSHA PEL*: [1910.1025] TWA 0.050 mg/m3 See Appendix C [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

IDLH 100 mg/m3 (as Pb) Conversion

Physical Description A heavy, ductile, soft, gray solid. MW: 207.2 BP: 3164°F MLT: 621°F Sol: Insoluble

VP: 0 mmHg (approx) IP: NA Sp.Gr: 11.34 Fl.P: NA UEL: NA LEL: NA

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities Strong oxidizers, hydrogen peroxide, acids

Measurement Methods NIOSH 7082, 7105, 7300, 7700, 7701, 7702; OSHA ID121, ID125G, ID206

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contaminated Change: Daily First Aid (See procedures)

Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 0.5 mg/m3: (APF = 10) Any air-purifying respirator with a high-efficiency particulate filter/(APF = 10) Any supplied-air respiratorUp to 1.25 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF

= 25) Any powered, air-purifying respirator with a high-efficiency particulate filterUp to 2.5 mg/m3: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particu- late filter/(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is oper- ated in a continuous-flow mode/(APF = 50) Any powered, air-purifying respirator with a tight- fitting facepiece and a high-efficiency particulate filter/(APF = 50) Any self-contained breath- ing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceUp to 50 mg/m3: (APF = 1000) Any supplied-air respirator operated in a pressure- demand or other positive-pressure modeUp to 100 mg/m3: (APF = 2000) Any supplied-air res- pirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure modeEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape:

(APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/ Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tis- sue

From NIOSH Pocket Guide to Chemical

Lithium hydride CAS 7580-67-8 LiH RTECS OJ6300000

Synonyms & Trade Names Lithium monohydride DOT ID & Guide 1414 1382805 138 (fused, solid)

ExposureLimits NIOSH REL: TWA 0.025 mg/m3
OSHA PEL: TWA 0.025 mg/m3
IDLH 0.5 mg/m3 Conversion

Physical Description Odorless, off-white to gray, translucent, crystalline mass or white powder. MW: 7.95 BP: Decomposes MLT: 1256°F Sol: Reacts

VP: 0 mmHg (approx) IP: NA Sp.Gr: 0.78 Fl.P: NA UEL: NA LEL: NA

Combustible Solid that can form airborne dust clouds which may explode on contact with flame, heat, or oxidizers.

Incompatibilities & Reactivities Strong oxidizers, halogenated hydrocarbons, acids, water [Note: May ignite SPONTANEOUSLY in air and may reignite after fire is extinguished. Reacts with water to form hydrogen & lithium hydroxide.]

Measurement Methods OSHA ID 121

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Brush (DO NOT WASH) Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench (>0.5 mg/m3) First Aid (See procedures) Eye: Irrigate immediately Skin: Brush (DO NOT WASH) Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 0.25 mg/m3: (APF = 10) Any air-purifying respirator with a high-efficiency particulate filter/(APF = 10) Any supplied-air respiratorUp to0.5 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode*/(APF= 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/(APF= 25) Any powered, air-purifying respirator with a high-efficiency particulate filter*/(APF =50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator with a high- efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; eye, skin burns; mouth, esophagus burns (if ingested); nausea; muscle twitches; mental confusion; blurred vision

Target Organs Eyes, skin, respiratory system, central nervous system

From NIOSH Pocket Guide to Chemical Hazards

Mercury compounds [except (organo) alkyls] (as Hg) CAS 7439-97-6 (metal) Hg (metal) RTECS OV4550000 (metal)

Synonyms & Trade Names Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver- Synonyms of "other" Hg compounds vary depending upon the specific compound. DOT ID & Guide 2809 172 (metal)

ExposureLimits NIOSH REL: Hg Vapor: TWA 0.05 mg/m3 [skin]Other: C 0.1 mg/m3 [skin] OSHA PELt: C 0.1 mg/m3

IDLH 10 mg/m3 (as Hg) Conversion

Physical Description Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW: 200.6 BP: 674°F FRZ: -38°F Sol: Insoluble VP: 0.0012 mmHg IP: ? Sp.Gr: 13.6 (metal) Fl.P: NA UEL: NA LEL: NA

Metal: Noncombustible Liquid

Incompatibilities & Reactivities Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Measurement Methods NIOSH 6009; OSHA ID140

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: No recommendation Wash skin: When contaminated Remove: When wet or contaminated Change: Daily First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations Mercury vapor:NIOSHUp to 0.5 mg/m3: (APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concemt/(APF = 10) Any supplied-air respiratorUp to 1.25 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concemt(canister)Up to 2.5 mg/m3: (APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concemt/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concemt/(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respi- rator with a full facepieceUp to 10 mg/m3: (APF = 1000) Any supplied-air respirator operatedin a pressure-demand or other positive-pressure modeEmergency or planned entry into un- known concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing appa- ratus that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self- contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatusOther mercury compounds:NIOSH/OSHAUp to 1 mg/m3: (APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concemt/(APF = 10) Any supplied-air respiratorUp to 2.5 mg/m3: (APF = 25) Any supplied-air

respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respira- tor with cartridge(s) providing protection against the compound of concemt(canister)Up to 5 mg/m3: (APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) pro- viding protection against the compound of concemt/(APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concemt/(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respi- rator with a full facepieceUp to 10 mg/m3: (APF = 1000) Any supplied-air respirator operated
in a pressure-demand or other positive-pressure modeEmergency or planned entry into un- known concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing appa- ratus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self- contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact
Symptoms Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneurnonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaus- tion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

From NIOSH Pocket Guide to Chemical Hazards

Methyl alcohol CAS 67-56-1 CH30H RTECS PC1400000

Synonyms & Trade Names Carbinol, Columbian spirits, Methanol, Pyroligneous spirit, Wood alcohol, Wood naphtha, Wood spirit DOT ID & Guide 1230 131

ExposureLimits NIOSH REL: TWA 200 ppm (260 mg/m3) ST 250 ppm (325 mg/m3) [skin]

OSHA PELt: TWA 200 ppm (260 mg/m3)

IDLH 6000 ppm Conversion 1 ppm = 1.31 mg/m3

Physical Description Colorless liquid with a characteristic pungent odor. MW: 32.1 BP: 147°F FRZ: -144°F Sol: Miscible

VP: 96 mmHg IP: 10.84 eV Sp.Gr: 0.79

Fl.P: 52°F UEL: 36% LEL: 6.0%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Measurement Methods NIOSH 2000, 3800; OSHA 91

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respira- tory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 2000 ppm: (APF = 10) Any supplied-air respiratorUp to 5000 ppm: (APF = 25) Any supplied-air respirator operated in a continuous- flow modeUp to 6000 ppm: (APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, upper respiratory system; headache, drowsiness, dizziness, nau- sea, vomiting; visual disturbance, optic nerve damage (blindness); dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract

From NIOSH Pocket Guide to Chemical Hazards

Methylamine CAS 74-89-5 CH3NH2 RTECS PF6300000

Synonyms & Trade Names Aminomethane, Methylamine (anhydrous), Methylamine (aqueous), Monomethylarnine DOT ID & Guide 1061 118 (anhydrous)1235 132 (aqueous) ExposureLimits NIOSH REL: TWA 10 ppm (12 mg/m3)
OSHA PEL: TWA 10 ppm (12 mg/m3)

IDLH 100 ppm Conversion 1 ppm = 1.27 mg/m3

Physical Description Colorless gas with a fish- or ammonia-like odor. [Note: A liquid below
21°F. Shipped as a liquefied compressed gas.]

MW: 31.1 BP: 21°F FRZ: -136°F Sol: Soluble

VP: 3.0 atm IP: 8.97 eV RGasD: 1.08 Sp.Gr: 0.70 (Liquid at 13°F) Fl.P: NA (Gas) 14°F (Liquid) UEL: 20.7% LEL: 4.9%

Flammable Gas Class IA Flammable Liquid

Incompatibilities & Reactivities Mercury, strong oxidizers, nitromethane [Note: Corrosive to copper & zinc alloys, aluminum & galvanized surfaces.]

Measurement Methods OSHA 40

Personal Protection & Sanitation Skin: Prevent skin contact (solution)/Frostbite Eyes: Prevent eye contact (solution)/Frostbite Wash skin: When contaminated (solution) Remove: When wet (flammable) Change: No recommendation Provide: Frostbite First Aid (See procedures)

Eye: Irrigate immediately (solution)/Frostbite Skin: Water flush immediately (solution)/ Frostbite Breathing: Respiratory support Swallow: Medical attention immediately (solution)

Respirator Recommendations NIOSH/OSHAUp to 100 ppm: (APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concem£/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any
air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted can- ister providing protection against the compound of concern/Any appropriate escape-type, self- contained breathing apparatus

Exposure Routes inhalation, skin absorption (solution), ingestion (solution), skin and/or eye contact (solution/liquid)

Symptoms Irritation eyes, skin, respiratory system; cough; skin, mucous membrane burns; der-
matitis; conjunctivitis; liquid: frostbite

Target Organs Eyes, skin, respiratory system

From NIOSH Pocket Guide to Chemical

Petroleum distillates {naphtha) CAS 8002-05-9 RTECS SE7449000

Synonyms & Trade Names Aliphatic petroleum naphtha, Petroleum naphtha, Rubber solvent

DOT ID & Guide 1255 128

ExposureLimits NIOSH REL: TWA 350 mg/m3 C 1800 mg/m3 [15-minute] OSHA PELt: TWA 500 ppm (2000 mg/m3)

IDLH 1100 ppm [10%LEL] Conversion 1 ppm = 4.05 mg/m3

Physical Description Colorless liquid with a gasoline- or kerosene-like odor. [Note: A mixture of paraffins *(CS* to C 13) that may contain a small amount of aromatic hydrocarbons.]

MW: 99 (approx) BP: 86-460°F FRZ: -99°F Sol: Insoluble VP: 40 mmHg (approx) IP: ? Sp.Gr: 0.63-0.66 Fl.P: -40 to -86°F UEL: 5.9% LEL: 1.1%

Flammable Liquid

Incompatibilities & Reactivities Strong oxidizers Measurement Methods NIOSH 1550

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respira- tory support Swallow: Medical attention immediately

Respirator Recommendations NIOSHUp to 850 ppm: (APF = 10) Any supplied-air respirato- rUp to 1100 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode*/ (APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any sup- plied-air respirator with a full facepieceEmergency or planned entry into unknown concentra- tions or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode in combination with an auxiliary self-contained posi- tive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respira- tor (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, nose, throat; dizziness, drowsiness, headache, nausea; dry cracked skin; chemical pneumonitis (aspiration liquid)

Target Organs Eyes, skin, respiratory system, central nervous system

From NIOSH Pocket Guide to Chemical

Phosphine CAS 7803-51-2 PH3 RTECS SY7525000

Synonyms & Trade Names Hydrogen phosphide, Phosphorated hydrogen, Phosphorus hydride, Phosphorus trihydride DOT ID & Guide 2199 119

ExposureLimits NIOSH REL: TWA 0.3 ppm (0.4 mg/m3) ST 1 ppm (1 mg/m3) OSHA PELt: TWA 0.3 ppm (0.4 mg/m3)

IDLH 50 ppm Conversion 1 ppm = 1.39 mg/m3

Physical Description Colorless gas with a fish- or garlic-like odor. [pesticide] [Note: Shipped as a liquefied compressed gas. Pure compound is odorless.]

MW: 34.0 BP: -126°F FRZ: -209°F Sol: Slight VP: 41.3 atm IP: 9.96 eV RGasD: 1.18

Fl.P: NA (Gas) UEL: ?LEL: 1.79%

Flammable Gas

Incompatibilities & Reactivities Air, oxidizers, chlorine, acids, moisture, halogenated hydrocar- bons, copper [Note: May ignite SPONTANEOUSLY on contact with air.]

Measurement Methods OSHA 1003, ID180

Personal Protection & Sanitation Skin: Frostbite Eyes: Frostbite Wash skin: No recommenda- tion Remove: When wet (flammable) Change: No recommendation Provide: Frostbite First Aid (See procedures) Eye: Frostbite Skin: Frostbite Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHAUp to 3 ppm: (APF = 10) Any supplied-air respi- ratorUp to 7.5 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow modeUp to 15 ppm: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of con- cern/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceUp to 50 ppm: (APF = 1000) Any supplied-air respi- rator operated in a pressure-demand or other positive-pressure modeEmergency or planned en- try into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other posi- tive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin and/or eye contact (liquid)

Symptoms Nausea, vomiting, abdominal pain, diarrhea; thirst; chest tightness, dyspnea (breathing difficulty); muscle pain, chills; stupor or syncope; pulmonary edema; liquid: frostbite Target Organs respiratory system

From NIOSH Pocket Guide to Chemical

Phosphorus (yellow) CAS 7723-14-0 P4 RTECS TH3500000

Synonyms & Trade Names Elemental phosphorus, White DOT ID & Guide phosphorus 1381 136

ExposureLimits NIOSH REL: TWA 0.1 mg/m3 OSHA PEL: TWA 0.1 mg/m3

IDLH 5 mg/m3 Conversion

Physical Description White to yellow, soft, waxy solid with acrid fumes in air. [Note: Usually shipped or stored in water.]

MW: 124.0 BP: 536°F MLT: 111°F Sol: 0.0003% Sp.Gr: 1.82

VP: 0.03 mmHg IP: ? Fl.P: ? UEL: ?LEL: ?

Flammable Solid

Incompatibilities & Reactivities Air, oxidizers (including elemental sulfur & strong caustics), halogens [Note: Ignites SPONTANEOUSLY in moist air.]

Measurement Methods NIOSH 7905

Personal Protection & Sanitation Skin: Prevent skin contact* [*Note: Flame retardant personal protective equipment should be provided.] Eyes: Prevent eye contact Wash skin: When con- taminated Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench

First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 1 mg/m3: (APF = 10) Any supplied-air res- piratorUp to 2.5 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode£Up to 5 mg/m3: (APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other posi- tive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: Any appropriate escape-type, self- contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, respiratory tract; eye, skin burns; abdominal pain, nausea, jaundice; anemia; cachexia; dental pain, salivation, jaw pain, swelling

Target Organs Eyes, skin, respiratory system, liver, kidneys, jaw, teeth, blood

From NIOSH Pocket Guide to Chemical

Sodium hydroxide CAS 131o-73-2 NaOH RTECS WB4900000

Synonyms & Trade Names Caustic soda, Lye, Soda lye, Sodium hydrate DOT ID & Guide 1823 154 (dry, solid)1824 154 (solution)

ExposureLimits NIOSH REL: C 2 mg/m3 OSHA PELt: TWA 2 mg/m3 IDLH 10 mg/m3 Conversion

Physical Description Colorless to white, odorless solid (flakes, beads, granular form). MW: 40.0 BP: 2534°F MLT: 605°F Sol: 111% VP: 0 mmHg (approx) IP: NA Sp.Gr: 2.13 Fl.P: NA UEL: NA LEL: NA

Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.

Incompatibilities & Reactivities Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane [Note: Corrosive to metals.]

Measurement Methods NIOSH 7401

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily Provide: Eye- wash, Quick drench First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately Respirator Recommendations NIOSH/OSHAUp to 10 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode£/(APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/(APF = 25) Any powered, air-purifying respi- rator with a dust and mist filter£/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other posi- tive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator with a high-efficiency particulate filter/Any appropriate escape-type, self- contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; pneumonitis; eye, skin burns; temporary loss of hair

Target Organs Eyes, skin, respiratory system

From NIOSH Pocket Guide to Chemical

Sulfuric acid CAS 7664-93-9 H2S04 RTECS WS5600000

Synonyms & Trade Names Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous) DOT ID & Guide 1830 1371831 137 (fuming)1832 137 (spent) ExposureLimits NIOSH REL: TWA 1 mg/m3

OSHA PEL: TWA 1 mg/m3

IDLH 15 mg/m3 Conversion

Physical Description Colorless to dark-brown, oily, odorless liquid. [Note: Pure compound is a solid below 51°F. Often used in an aqueous solution.]

MW: 98.1 BP: 554°F FRZ: 51°F Sol: Miscible

VP: 0.001 mmHg IP: ? Sp.Gr: 1.84 (96-98% acid) Fl.P: NA UEL: NA LEL: NA

Noncombustible Liquid, but capable of igniting finely divided combustible materials.

Incompatibilities & Reactivities Organic materials, chlorates, carbides, fulminates, water, pow- dered metals [Note: Reacts violently with water with evolution of heat. Corrosive to metals.] Measurement Methods NIOSH 7903; OSHA ID165SG

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation Provide: Eyewash (>1%), Quick drench (>1%) First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 15 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode£/(APF = 25) Any powered, air-purifying respira- tor with acid gas cartridge(s) in combination with a high-efficiency particulate filter£(APF = 50) Any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combi- nation with a high-efficiency particulate filter/(APF = 50) Any air-purifying, full-facepiece res- pirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having a high- efficiency particulate filter/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other posi- tive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister hav- ing a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; con-junctivitis; stomatis; dental erosion; eye, skin burns; dermatitis Target Organs Eyes, skin, respiratory system, teeth

From NIOSH Pocket Guide to Chemical Hazards

Toluene CAS 108-88-3 C6H5CH3 RTECS XS5250000

Synonyms & Trade Names Methyl benzene, Methyl benzol, Phenyl methane, Toluol DOT ID & Guide 1294 130

ExposureLimits NIOSH REL: TWA 100 ppm (375 mg/m3) ST 150 ppm (560 mg/m3) OSHA PELt: TWA 200 ppm C 300 ppm 500 ppm (IO-minute maximum peak)

IDLH 500 ppm Conversion 1 ppm = 3.77 mg/m3

Physical Description Colorless liquid with a sweet, pungent, benzene-like odor

MW: 92.1 BP: 232°F FRZ: -139°F Sol(74°F): 0.07% VP: 21 mmHg IP: 8.82 eV Sp.Gr: 0.87

Fl.P: 40°F UEL: 7.1% LEL: 1.1%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Measurement Methods NIOSH 1500, 1501, 3800, 4000; OSHA 111

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respira- tory support Swallow: Medical attention immediately

Respirator Recommendations NIOSHUp to 500 ppm: (APF = 10) Any chemical cartridge respi- rator with organic vapor cartridge(s)*/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 10) Any supplied-air respirator* /(APF = 50) Any self-contained breathing apparatus with a full facepieceEmergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self- contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted or- ganic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizzi- ness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insom- nia; paresthesia; dermatitis; liver, kidney damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

From NIOSH Pocket Guide to Chemical Hazards

o-Xylene CAS 95-47-6

C6H4(CH3)2 RTECS ZE2450000

Synonyms & Trade Names 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol DOT ID & Guide 1307 130

ExposureLimits NIOSH REL: TWA 100 ppm (435 mg/m3) ST 150 ppm (655 mg/m3) OSHA PELt: TWA 100 ppm (435 mg/m3)

IDLH 900 ppm Conversion 1 ppm = 4.34 mg/m3 Physical Description Colorless liquid with an aromatic odor.

MW: 106.2	BP: 292°F	FRZ: -13°F	Sol: 0.02%
VP: 7 mmHg	IP: 8.56 eV	Sp.Gr: 0.88	
Fl.P: 90°F	UEL: 6.7%	LEL: 0.9%	

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids Measurement Methods NIOSH 1501, 3800; OSHA 1002

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respira- tory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHAUp to 900 ppm: (APF = 10) Any chemical car- tridge respirator with organic vapor cartridge(s)*/(APF = 25) Any powered, air-purifying respi- rator with organic vapor cartridge(s)*/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepieceEmergency or planned entry into un- known concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing appa- ratus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self- contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full- facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canis- ter/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact Symptoms Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Comment [12]: End of NIOSH Pocket Guide. Please note that this NIOSH section is one of the rare instances where Berg gives a credit. He did not write any of this. Again, he is benefitting off of other people's work and claiming copyright ownership. 21 pages of the NIOSH Pocket Guide.

METHAMPHETAMINE PRODUCTION METHODS

There are several different production methods that use various types of equipment and different chemicals to produce basically the same product. Most of the ingredients used to manufacture the drug can be purchased at local retail stores. The equipment used in the production process can range from a mason jar to sophisticated laboratory equipment. Unlike other dangerous drugs such as LSD, it doesn't take a college-educated chemist to produce methamphetamine. Many clan lab chemists have posted their recipes on the web. User's can set up a small lab in their kitchen or even in their car to produce enough drugs to sustain their addiction. Some labs have been found in motor homes, cars, basements, apartments, vans, motels, and mini-storage facilities.
Meth is produced using readily available precursor chemicals, reagents, and solvents. Although there are many possible combinations of chemicals and processes that can be used to produce methamphetamine, in the United States there are five primary methods. The five methods utilize one of three precursors: ephedrine, pseudoephedrine, or phenyl-2-propanone (commonly known as phenylacetone or P2P). The most common methods used in the United States to produce methamphetamine are described below.

A. Ephedrine/Pseudoephedrine Reduction Methods
Ephedrine/pseudoephedrine is the most common precursor used in the production of methamphetamine in the United States. The process involves the reduction of ephedrine or pseudoephedrine with (1) hydriodic acid and red phosphorus, (2) iodine and red phosphorus, (3) iodine and hypophosphorous acid or (4) a metal, usually lithium or sodium, in anhydrous ammonia. Pseudoephedrine has largely replaced ephedrine as the leading precursor in this type of production method.

1. Hydriodic acid/red phosphorus.
Also known as "Red P" lab, "Tweeker" lab, "HI" lab, "Hot Cook" lab, and "Mexican national" lab. The principal chemicals used in this method are ephedrine or pseudoephedrine, hydriodic acid and red phosphorus. This method can yield multi-pound quantities of high quality d- methamphetamine and is often associated with Mexican drug trafficking organizations, including those who operate meth labs in the U.S. Hazards associated with this method are due to the conversion of red phosphorous to white phosphorous, which is extremely volatile and produces potentially lethal Phosphine gas.

Comment [13]: Mixture of deletions and verbatim, plagiarized from the US Department of Justice's National Drug Intelligence Center's Information Brief titled *Methamphetamine Production Methods: A Guide for First Responders."*

U.S. DOJ. Methamphetamine Production Methods: A Guide for First
Responders. United Sates Department
of Justice. Product # 2003-L0490-001.
April 2003

This goes on for 8 ½ pages.

2. Iodine/red phosphorus. The principal chemicals used in this method are ephedrine or pseudoephedrine, iodine, and red phosphorus. The required hydriodic acid in this variation of the hydriodic acid/red phosphorus method is produced by the reaction of iodine in water with red phosphorus. This method yields ounce quantities of high quality d-methamphetamine.

3. Iodine/hypophosphorous acid. The principal chemicals are ephedrine or pseudoephedrine, iodine, and hypophosphorous acid. The required hydriodic acid in this variation of the hydriodic acid/red phosphorus method is produced by the reaction of iodine in water with hypophosphorous acid. Known as the hypo method, this method yields lower to high quality d-methamphetamine. This method is more dangerous than other ephedrine/pseudoephedrine reduction methods because hypophosphorous acid can produce deadly phosphine gas.

4. Ammonia Lab
Also known as the Nazi method or Birch method. The principal chemicals associated with this method are ephedrine and pseudoephedrine, anhydrous ammonia, and sodium or lithium metal. This method yields ounce quantities of high quality d-methamphetamine and is often used by small-scale laboratory operators – who account for a majority of laboratory operators in the United States. This method is relatively simple and is less time-consuming than the other ephedrine/pseudoephedrine reduction methods. Each production cycle is approximately 30 minutes. The dangers associated with this type of lab are that when sodium or lithium metals come into contact with water they react violently; ammonia is toxic and flammable; and anhydrous ammonia is lethal.

B. Phenyl-2-Propanone (P2P) Method.
Also known as "Biker Lab" or "Prop Dope" lab. The principal chemicals associated with this method are phenyl-2-proponone, aluminum foil, methylamine, and mercuric chloride. This method, which yields low quality dl-methamphetamine, was popular from the 1960s through the 1980's when primarily outlaw motorcycle gangs controlled meth production. Currently this method is used only in a few areas -primarily northern Pennsylvania.

PRECURSORS, REAGENTS, AND SOLVENTS

Precursors are the necessary raw materials that become part of the finished product, for example, pseudoephedrine and P2P.

Reagents are substances that react chemically with the precursor but do not become part of the finished product, for example, hydriodic acid and lye.

Solvents are substances that do not react chemically with a precursor or reagent nor become part of the finished product but are used to cool, mix, and cleanse impurities from the finished product, for example, Freon, camping fuel, and paint thinner.

COMMON PRECURSORS AND REAGENTS USED IN EPHEDRINE/PSEUDOEPHEDRINE REDUCTION :METHODS

Comment [14]: Illegal use of the SUDAFED trademark.

Although there are more than 32 chemicals that can be used in the methamphetamine production process, only a few common precursor chemicals and reagents are typically found in meth labs. In general, the chemicals found at laboratories using the ephedrine/pseudophedrine reduction method include pseudoephedrine and one or more of the following reagents: red phosphorus, hydriodic acid, iodine, hypophosphorous acid, anhydrous ammonia, lithium, sodium, and lye.

Pseudoephedrine has largely replaced ephedrine as the precursor chemical used in domestic meth labs because of the stringent controls placed on ephedrine. At small labs pseudoephedrine typically is in the form of over-the-counter cold medications in white, red, or green tablets packaged in foil and plastic blister packs or in small plastic bottles. At large labs white pseudoephedrine tablets, typically smuggled from Canada in bulk form, are found packaged in various sizes of plastic bottles, vacuum-sealed bags, and in 5 and 7-gallon plastic buckets.

Hydriodic acid is the principal reagent used in the hydriodic acid/red phosphorus, iodine/red phosphorus, and iodine/hypophosphorous acid methods of production. Hydriodic acid is a yellowish, brownish, or reddish liquid that is heavier than water. Meth lab operators typically store hydriodic acid in plastic gasoline containers and antifreeze bottles. Because hydriodic acid is rarely available in the

United States, lab operators often synthesize it using a combination of iodine, water and either red phosphorus or hypophosphorous acid.

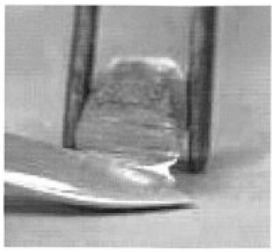
Iodine is used in the iodine/red phosphorus and iodine/ hypophosphorous acid methods of production to produce the reagent hydriodic acid. It typically is found in the form of flakes, crystals, or tincture (iodine solution with ethyl alcohol and water) at meth labs. Lab operators prefer iodine flakes or crystals because the process of crystallizing iodine tincture is time consuming and yields small quantities of crystals in relation to the amount of tincture used. Iodine crystals can be purchased at feed stores, pet stores, and over the Internet. Because the sale of iodine crystals is closely monitored and regulated as a List II chemical in the U.S., many meth lab operators steal iodine crystals.

Red phosphorus is a reagent that is mixed with iodine and water to create hydriodic acid. Red phosphorus found as large meth labs typically is packaged in plastic bottles and vacuum-sealed bags and usually is obtained from chemical suppliers. Operators of smaller labs often scrape red phosphorus from matchbook striker pads and road flares. Lab operators often reuse red phosphorus in multiple batches of meth by filtering it from the sludge-like reaction mixture that results from the previous cook.

Hypophosphorous acid is a reagent that may be substituted for red phosphorus. Hypophosphorous acid is a colorless, oily liquid with a sour smell. It is usually sold in pint-size, dark brown glass bottles packaged in 3 by 3 by 6-inch cardboard boxes. Hypophosphorous acid is a strong acid and a powerful reducing agent used in chemical synthesis. It is used legitimately in the preparation of hypophosphites, which are used for a wide range of applications including chemical plating and food preservation. It is commercially available from chemical supply stores and may be purchased via the Internet. Many lab operators substitute hypophosphorous acid for red phosphorus, which has become less readily available because suppliers are now subject to more stringent government regulations. This method is extremely dangerous because improper mixing and cooking of iodine, hypophosphorous, and ephedrine/pseudoephedrine produces deadly phosphine gas.

Anhydrous ammonia is the principal reagent used in the Birch reduction method of production. It is a common agricultural fertilizer that often is stolen

from farm fields and farm supply outlets. It also is used as a refrigerant in commercial air conditioning systems. Meth producers typically store stolen anhydrous ammonia in 20-pound propane cylinders. The valves on propane cylinders used to store anhydrous ammonia take on a bluish color that is easily identifiable. Propane cylinders are not designed to store anhydrous ammonia. They can explode if the outside temperature rises, causing pressure to build up inside the cylinder, or if the ammonia eats through the walls of the cylinder. Valves frequently deteriorate and are hazardous because they may leak or break, causing the gas to be released. Anhydrous ammonia is a hydroscopic compound, which means that it seeks water from the nearest source, including the human body. The eyes, lungs, and skin are at greatest risk because of their high moisture content. Caustic bums result when anhydrous ammonia dissolves into body tissue. Most deaths from anhydrous ammonia are caused by severe damage to the throat and lungs. When large amounts are inhaled, the throat swells and the victim suffocates. Exposure to vapors or liquids also can cause blindness.



Lithium metal is a reagent used in the Birch reduction method of production. Lithium typically is extracted from lithium batteries, which are used in watches, cameras, laptop computers, and other high-drain devices such as electronic meters on gas and oil wells.

Sodium metal occasionally is used as a reagent in place of lithium metal in the Birch reduction method. Of the two metals, sodium is significantly more dangerous and reacts more explosively with water. Sodium typically is not sold directly to the public by chemical supply houses; however, many lab operators attempting to purchase sodium claim they are academic researchers or representatives of chemical, industrial, or pharmaceutical firms.

Lye is a common reagent used in many meth labs, particularly those using the red phosphorous, hypophosphorous acid, and P2P methods. Drain cleaner is the most common form of lye used by meth producers. It can be purchased at most retail stores where cleaning products are sold.

Comment [15]: Illegal use of the RED DEVIL LYE trademark.

COMNION PRECURSORS AND REAGENTS USED IN THE P2P NETHOD.

P2P is a precursor used legitimately in the production of amphetamine-based pharmaceuticals such as Desoxyn and Adderall. It is a clear, moderately viscous liquid. Meth lab operators typically store the chemical in tightly sealed containers.

Methylamine is a gas that typically is prepared as a salt or liquid solution. Although it has a few legitimate uses, it is a controlled, List I chemical. Meth lab producers typically produce methylamine by using other, more easily obtainable substances.

Mercuric chloride found at laboratory sites often is mixed in a container with alcohol and aluminum foil strips. Before it is mixed with alcohol and foil strips, it is in the form of crystals, white granules, or powder. Mercuric chloride is a "violent" poison and should be handled with extreme care.

Lye also is used as a reagent in the P2P production method.

GASES USED IN METHAMPHETAMINE PRODUCTION

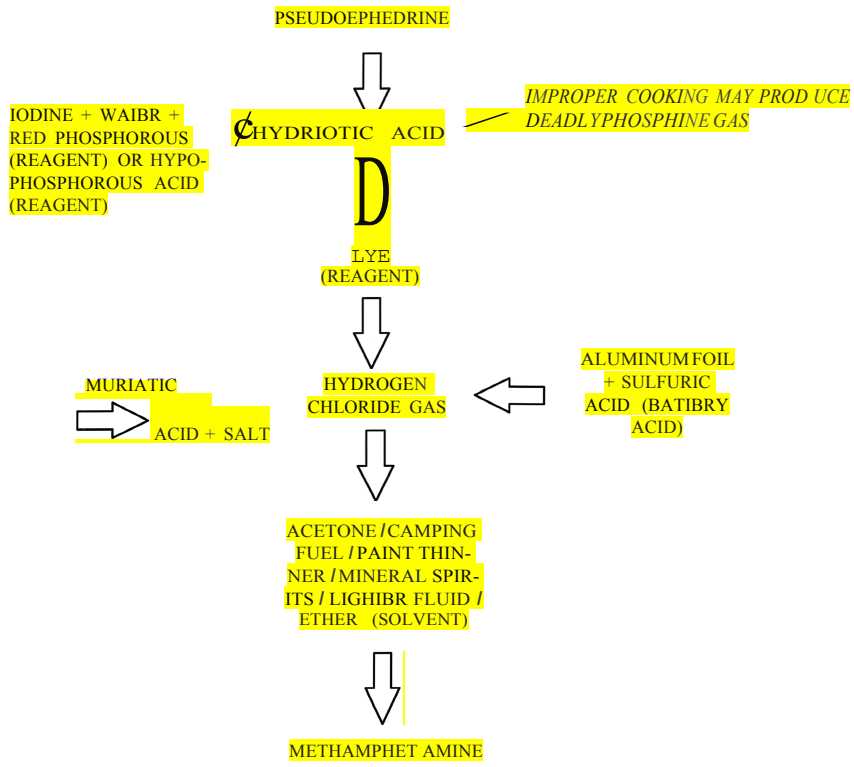
Hydrogen chloride gas (HCL). During the next to last phase of meth production, lab operators convert the meth in solution, commonly called meth oil, into powdered form. This phase often is called salting out or crystallizing. Although there are several ways that this can be done, the preferred method is to direct HCL gas – which may be obtained commercially or generated in the lab – into or over the liquid methamphetamine, which will then be transformed into powdered meth. Commercially, HCL gas is sold in cylindrical, steel containers weighing from 0.5 pounds to more than 100 pounds. Many lab operators attempt to disguise the containers by painting them.

Hydrogen chloride gas can be generated by mixing muriatic acid (hydrochloric acid), used in concrete etching and as a pH adjuster in swimming pools, with sodium chloride (table salt or rock salt) or aluminum foil with sulfuric acid (battery acid). Laboratory operators attempt to conceal these acids by putting them in plastic household containers – orange juice containers, for example. Meth producers who produce their own HCL often create homemade containers that are used to apply the gas to the methamphetamine. They often create these containers by boring a hole in the cap of a 2-liter or smaller plastic bottle, which is then fitted

with clear plastic tubing used to direct the HCL gas to the methamphetamine. HCL gas is colorless, corrosive, and nonflammable and has been described as having a sweet, garlicky odor. The gas is invisible and, if inhaled, will cause coughing or choking, pulmonary edema, inflammation and ulceration of the respiratory tract, and possibly death. Exposure to HCL gas or concentrated solutions also causes severe bums and irritates mucous membranes and eyes. Extreme care should be taken when opening household containers at meth labs.

SOLVENTS USED IN METHA1\1PHETAMINE PRODUCTION

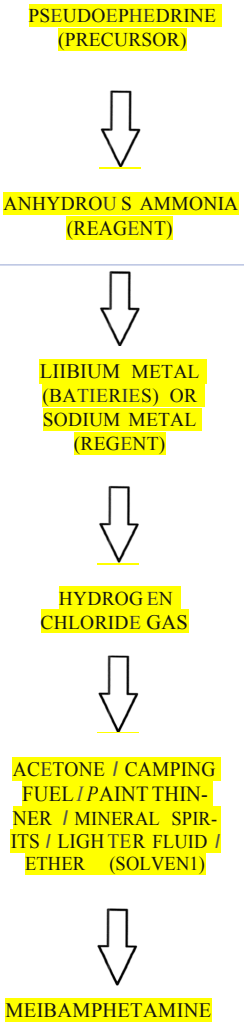
A variety of solvents are used to cool, mix, and purify meth in the final stages of production. Similar solvents are used in all types of labs, regardless of the production method. The most common solvents include ether, lighter fluid, mineral spirits, paint thinner, camping fuel, and acetone. Most of the solvents used by



meth producers are common household products that can be purchased at retail stores; however, some producers purchase solvents in commercial quantities.

An optional, final step that some meth lab operators perform is to remove impurities from meth by "washing" it with a solvent, typically acetone. Methamphetamine is placed in a filtering material, typically a coffee filter for small amounts or a bed sheet for large amounts. Acetone is then poured over the methamphetamine. Most of the meth will remain in the filtering material, and impurities are washed away by the solvent. Acetone is a hazardous, highly flammable, clear liquid. Its vapors are irritating to the eyes and nose, and prolonged exposure can cause dizziness, narcosis, or coma. Acetone is usually purchased as nail polish remover from retail stores.

RED P, TWEEKER, HI, HOT COOK, MEXICAN NATIONAL LAB



Comment [16]:

END OF Mixture of deletions and verbatim, plagiarized from the US Department of Justice's National Drug Intelligence Center's Information Brief titled *Methamphetamine Production Methods: A Guide for First Responders."*

U.S. DOJ. Methamphetamine Production Methods: A Guide for First Responders. United Sates Department of Justice. Product # 2003-L0490-001. April 2003

This was 8 ½ pages. And we are supposed to believe that BERG wrote this highly sophisticated, highly technical, highly scientific text? Exactly how stupid does Berg think his readers are?

EQUIPMENT USED IN METH LAB PRODUCTION

Although large, elaborate meth labs may use commercial laboratory equipment, most individual lab operators who produce small quantities of meth use supplies found around the home. These generally consist of thermoses, mason jars, soda bottles, batteries (lithium metal), denatured alcohol, drain openers, propane cylinders, hot plates, electric frying pans, all types of tubing, kitty litter to absorb toxic fumes, coffee filters, funnels and metal window screens.

Meth "cooks" are quite creative in selecting locations to manufacture their product. Meth labs have been found in apartments, homes, motels, cars, motorhomes, tractor-trailers, sheds, abandoned buildings, and in homemade caves or tunnels. Most meth labs that you will be called to decontaminate are located in homes, apartments, and motels. These will be the areas this manual will concentrate on.

AREA OF CONTAMINATION

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

- Processing or cooking areas: Gross contamination in these cases maybe caused by spills, boilover, explosions, or by chemical fumes and gases created during the heating and distilling portions of the "cooking" process. Indoor areas affected may include floors, walls, ceilings, used glassware and containers, working surfaces, furniture, carpeting, draperies and other textile products, plumbing fixtures, and drains, or heating and air-conditioning vents. Outdoor cooking areas could involve picnic tables, camping stoves, or other outdoor areas where cooking could occur.
- Disposal areas: Indoor areas include sinks, toilets, bathtubs, plumbing traps and floor drains, vents, vent fans and chimney flues. Outdoor areas may include soil, surface water, groundwater, dumpsters, sewer or storm systems, septic systems and cesspools.
- Storage areas: Contamination may be caused by leaks, spills or open containers.

Secondary areas of contamination may include:

- Locations where contamination has migrated, such as hallways or high-

- Common areas in multiple dwelling structures and adjacent apartments or rooms may also be contaminated, including contamination of floors, walls, ceilings, furniture, carpeting, light fixtures, blinds, draperies and other textile products.
- Common ventilation or plumbing systems in hotels and multiple dwellings.

traffic areas.

Comment [17]: Plagiarized from pages 3 and 4 of *Cleanup of Clandestine Methamphetamine Labs Guidance Document,* Colorado Department of Health and Environment, 2003.

Common Manufacturing Materials found at cook sites:

1. Coffee Filters
2. Pseudoephedrine blister packs
3. Acetone
4. Toluene (brake cleaner)
5. Salt
6. Camping Fuel
7. Butane Fuel
8. Flares
9. Rubbing alcohol
10. Red Devil Lye
11. Match Pack Strikers
12. Lithium batteries
13. Gas cylinders, i.e. propane tanks
14. Heet
15. Automotive fuel additives
16. Hot plates
17. Lab glassware
18. Modified Soda Bottles
19. Coffee Grinder
20. Tubing
21. Hypodermic syringes
22. Containers of acid

Comment [18]: Generic list of items used in meth labs.

HAZARDS OF CLANLAB REMEDIATION

Each clanlab remediation company is responsible for compliance with all applicable OSHA regulations. This course is designed to address only the procedures necessary to remediate clanlab sites and is not intended to teach or replace OSHA training and regulatory compliance. If we were to teach each OSHA program related to the hazards of clanlab remediation, the course would span several weeks. It is the remediation company and its employees who must make sure that they have developed the proper plans and communicated those plans to all employees who will be at risk.

The institute has identified the following OSHA regulations as those that apply to this course. The list is not intended to be exclusive or all-inclusive, as there may be other regulations that apply to your specific situations.

Some regulatory headings are explained in summary, others are self-explanatory.

Overall Safety Plan
Hazard Communication
Blood Borne Pathogens Exposure Control Plan
Eye & Face Protection
HazWoper - see entire regulation in appendix I
Portable Ladder Safety
Job Hazard Assessment: In order to provide the safest possible environment under adverse circumstances, you must perform a hazard assessment in order to identify, reduce and/or correct situations that could jeopardize the health, safety, and lives of those working on a specific job site. These inspections should be conducted by persons trained to identify and correct (if possible) hazards. This should be a comprehensive floor-to-ceiling and wall-to-wall inspection targeting existing hazards and potential hazards, correcting what can be corrected, and communicating the hazard to the technicians, and providing the controls necessary to protect them. All of the hazards should be prioritized and corrected, reduced or eliminated in order of priority. Make sure you document everything.

For those technicians who are assigned to decontaminate a former clanlab, residual amounts of some hazardous chemicals, gasses, corrosives, and salts may remain on surfaces and contents and can present a danger. In addition,

there are possible risks of exposure to infectious disease through drug paraphernalia, i.e. used needles. Systemic absorption of chemicals or injury can occur through inhalation, skin exposure, accidental ingestion or percutaneous injury. Technicians have the potential to be exposed to varying concentrations of toxic chemicals and should be aware of symptoms of acute exposures from solvents, cyanides, corrosives, metals and their salts. When symptoms of exposure occur (shortness of breath; confusion; lethargy; dizziness; nausea; headache; burning of eyes, nose, throat, or skin) swift action must be taken.

1. Remove the person to fresh air.
2. If the contamination is physically on the person, wash it off with large amounts of water.
3. If the reaction is severe, call 9-1-1 for medical response.

Working in Hot Conditions: Working in impermeable suits and using respirators restricts airflow, traps body heat, and inhibits natural cooling by evaporation of sweat. Add extended physical exertion, and the risk of heat exhaustion or heat stroke becomes likely. Heat Exhaustion is characterized by general weakness, headache, cool clammy skin, fast pulse and nausea. If left to progress, it can lead to Heat Stroke, which is characterized by hot dry skin, cramps, and altered mental status. In order to combat heat stress, technicians should be encouraged to take breaks often, drink plenty of fluids, and keep their electrolytes in balance. Emergency care includes cooling and treating for shock. Seek emergency medical care for heat stroke.

Slips, Trips and Falls

Lead Safety Plan: Like asbestos, lead paint can be found in older homes, or new industrial construction. Today, lead paint is associated with brain and liver disorders from the inhalation and ingestion of flakes of paint, primarily by children. Special procedures mast be taken if you intend to remove lead-based paint from surfaces.

MSDS Development

Hand & Power Tool Safety

Asbestos: Asbestos is a widely used product in the United States. Floor tile, acoustical ceiling tiles, insulation, textured ceiling paint, and other asbestos-containing materials can be found in most properties. This means that if you are performing remediation services in a home or business, you may encounter asbestos. Asbestos is brittle and is friable. Disturbing brittle asbestos can cause particles to become airborne, where they can be inhaled into the lungs. Asbestosis may result which is a potentially fatal lung condition. Get training on asbestos removal or have your employer seek out a reputable subcontractor to remove the hazard.

EXPOSED WIRING HAZARD

OPEN FLOORING HAZARD

INTRODUCTION TO THE HAZARD COMMUNICATION PLAN AND MATERIAL SAFETY DATA SHEETS (MSDS)

In order to reduce or eliminate exposure to hazardous chemicals by company employees, OSHA enacted federal regulation 29CFR1910.1200, known as the Hazard Communication Act.

Employees working with chemicals must have a copy of the employer's Hazard Communication Plan complete with all Material Safety Data Sheets (MSDS) at their work site and at the company office. The Hazard Communication Plan outlines how the employer is going to lessen or prevent exposure to hazardous chemicals through the use of control work practices and personal protective equipment. The plan outlines what protective equipment to wear, what dangers exist with each chemical, and what to do if an exposure occurs.

The training a remediation technician receives must include reading and understanding this plan, and documentation of said training must be placed in the employees training file.

MATERIAL SAFETY DATA SHEETS

The Material Safety Data Sheet (MSDS) is a detailed information bulletin prepared by the manufacturer or importer of a chemical that describes the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first-aid procedures, and control measures. Information on an MSDS aids in the selection of safe products and helps prepare employers and employees to respond effectively to daily exposure situations as well as to emergency situations.

The MSDS/s are a comprehensive source of information for all types of employ-

Comment [19]: It is not known as the Hazard Communication Act.

It is the Hazard Communication Standard.

Berg obviously doesn't understand OSHA regulations and standards.

ers. There may be information on the MSDS that is not useful to you or not important to the safety and health in your particular operation. Concentrate on the information that is applicable to your situation. Generally, hazard information and protective measures should be the focus of concern.

Your Rights

1. Your workplace is required to have Material Safety Data Sheets available for every single hazardous chemical or substance you use or encounter as a part of your job.
2. These must be readily available for employee review at all times you are in the work place. In other words, they cannot be locked in an office or filing cabinet to which you do not have access.
3. Ifyou request to see an MSDS for a product you use at work, and your employer cannot show it to you, after one working day you may refuse to work with that product until you are shown the correct MSDS.
4. Ifyou request your own personal copy of a MSDS, your employer has 15 working days to provide it.

Comment [20]: Just a quick search found that this is plagiarized from a standard OSHA template about Hazard Communication. Here is one: http://www.ehs.okstate.edu/modules/msds.htm
Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

WEXFORD LABS JNC -- READY TO USE WEX-CIDE
========== MSDS Safety Information ========== ========== ========== ========== FSC: 6840 MSDS Date : 11/15/ 1994 MSDS Num: BWWRL LIJN: OOF039280 Product ID: READY TO USE WEX-CIDE MFN: 01 Responsible Party Cage: G0390 Name : WEXFORD LABS JNC Address: 325 LEFFJNGWELL AVE City: KIRKWOOD MO 63122-5000 Info Phone Number: 314-966-4134 Emergency Phone Number: 314-966-4134 Review Ind: Y Published: Y ========== ========== ========== ========== ========== == Preparer Co. when other than Responsible Party Co. ========== ========== ========== ========== Cage: G0390 Assigned Ind: Y Name: WEXFORD LABS JNC Address: 325 LEFFJNGWELL AVE City: KIRKWOOD MO 63122-5000 ========== ========== ========== ========== = Contractor Summary ========== ========== ========== ========== Cage: 56301 Name: WEXFOIRD LABS, JNC Address: 325 LEFFJNGWELL AVENUE City: KIRKWOOD MO 63122 Phone: 314-966-4134 Cage: G0390 Name: WEXFORD LABS JNC Address: 325 LEFFJNGWELL AVE City: KIRKWOOD MO 63122-5000 Phone : 314-966-4134 ========== ========== ========== ========== ========== Ingredients ========== ========== ========== ========== = Cas: 90-43-7 RTECS #: DV5775000 Name: 0-PHENYL PHENOL % Wt: 0.026 ---------- Cas: 120-32-1 RTECS #: G07175000 Name: 0-BENZYL-P-CHLOROPHENOL ORTHO-BENZYL-PARA-CHLOROPHENOL % Wt: 0.023 ========== ========== ========== ========== ========== Health Hazards Data ========== ========== == Route Of Entry Inds - Inhalation : NO Skin: NO Ingestion: NO Carcinogenicity Inds - NTP : NO IARC : NO OSHA: NO Effects of Exposure: EYES: IRRITATION. HARMFUL IF SWALLOWED. Explanation Of Carcinogenicity: NONE Signs And Symptions Of Overexposure : IRRITATION First Aid: EYES/SKJN: WASH W/WATER. OBTAJN MEDICAL ATTENTION JN ALL CASES. ========== ========== Handling and Disposal ========== ========== ========== ========== Spill Release Procedures : PICK UP MATERIAL W/WET VACUUM PICKUP, SQUEEGEE & PAN/MOP. FLUSH AREA THOROUGHLY W/WATER. ALLOW TO DRY. Waste Disposal Methods: THROUGH CONVENTIONAL SEWAGE SYSTEM. Handling And Storage Precautions: STORE AT ROOM TEMP. DON'T LEAVE CONTAJNERS OPEN. Other Precautions: AVOID CONTACT W/EYES, SKJN. KEEP OUT OF REACH OF CHILDREN. AVOID CLOTHJNG CONTACT. ========== ========== ========== ========== Fire and

Explosion Hazard Information ========== ========== ========== == Flash Point Text: NONE TO BOILJNG Extinguishing Media: SUITABLE TO ORIGJN OF FIRE Fire Fighting Procedures: NONE Unusual Fire/Explosion Hazard: NONE
========== ========== ========== ========== Control Measures ========== ========== ========== Respiratory Protection: NONE Protective Gloves: REQUIRED Eye Protection: REQUIRED Other Protective Equipment: NONE NEEDED Supplemental Safety and Health: PH: 2.5-2.9.
========== ========== ========== Physical/Chemical Properties ========== ========== ========== B.P. Text: >212F Spec Gravity: l.01 PH : (SUPP) Solubility in Water: 100% Appearance and Odor : CLEAR TRANSPARENT LIQUID W/LIGHT CITRIC ODOR ========== ========== ========== Reactivity Data ========== Stability Indicator: YES Materials To Avoid: STRONG ALKALIS Hazardous Polymerization Indicator: NO
========== = Toxicological Information ========== ========== ========== ========== Ecological Information ========== ========== ========== ========== MSDS Transport Information ==========
========== ========== ========== Regulatory In fonnation

Comment [21]: This is an MSDS. Berg did not write any of this.

CONFINED SPACE OPERATIONS

Confined spaces and permit-required confined spaces pose a significant health and safety threat to the remediation technician. Always think of confined spaces as dangerous.

Recognizing confined spaces

By memorizing the following criteria, you will be able to recognize an area that is classified as a confined space.

A confined space is a space that:

1. **Is large enough and configured in such a way that an employee can bodily enter and perform assigned work, AND**

-this means that your entire body (which is dependent on the size of the employee) must be able to completely fit into the space. If a 4' tall person was able to enter for work and collapses, it meets the requirements of the definition.)

2. **Has limited or restricted means for entry or exit, AND**

-this means, as a general rule, that if you must use a ladder to enter or exit the space or if you must be lowered into the space by a rope and/or a hoist, or you have to crawl through an opening, then it meets the requirements of this part of the definition.

-if you can walk down a set of steps or down a slope or only have to open a door and enter upright, then it does not meet the requirements of this part of the definition. Also, the basement or crawl-space under a dwelling is not considered as a confined space as far as OSHA is concerned. The law was written for application to general industry.

3. **Is not designed for continuous employee occupancy.**

Comment [22]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [23]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [24]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

-this means that the area is not designed for an employee to enter and perform assigned work for long periods of time on a continuous and routine basis. If the employee must enter to perform clean-up and disinfection, then it meets the criteria of the definition. On the other hand, the control area of a crane may have a limited access and egress and allow the operator to enter and work, but it was designed for he/she to work there for long periods of time.)

Permit-Required Confined Spaces

Some confined spaces may present with actual and/or potential hazards that may increase the injury potential to the technician. These spaces are called "permit-required confined spaces". (OSHA regulation 29CFR 1910.146)

Recognition of permit-required confined spaces

A permit-required confined space means a confined space that has one or more of the following characteristics:

1. **Contains or has the potential to contain a hazardous atmosphere.**

(-this means that the atmosphere (air) within the space may pose a significant threat to the entrant. Significant threat is defined as risking death, incapacitation, impairment of the ability of self-rescue or serious injury or acute illness. As a rule, atmospheric contaminates are divided into three categories)

A. *Oxygen deficits or enrichments:*
An oxygen deficit may be caused by decomposition of organic materials such as sewage, chemical reactions such as rust, and displacement by other gases and/or vapors. Even if there is enough oxygen when you enter, it can be used up by your presence and your work. Remember than an oxygen deficit or enrichment cannot be detected by smell; only a gas and vapor detector will work. Rusting pipes, dead animals and decaying matter in a confined space may help give you a hint that a deficit is present.

B. *Flammable gases, vapors, mists, and dusts:*
Chemicals and gases can explode suddenly, from cigarettes,

Comment [25]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [26]: Plagiarized. Mixture of paraphrasing and verbatim from http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf (first written in 2004)

static electricity, sparks, or heat.

C. *Toxic Materials:*

Toxic materials may be present in a solid, liquid, or gas. Toxins can harm your breathing and nervous system. Often, you cannot see or smell them. Some gases, vapors and dusts can burn or smother you quickly. Others don't have obvious effects and so are especially dangerous.

2. Contains or has the potential to contain an engulfment hazard.

(-this means that a fine solid material or liquid may be present or have the potential to be present which could engulf the entrant and suffocate them.)

3. Contains an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.

(-this means that any space/vessel that has sides that will allow the entrant to slide to the bottom and prohibit self-rescue or trap the entrant in a smaller opening will meet the definition.)

4. Contains ANY other recognized safety or health hazards.

(-this means that if there is mechanical, electrical, pneumatic, hydraulic, heat, cold, noise, etc. hazards, then this space is a permit space. As a rule, all in-coming lines and pipes must be "blocked" and all internal moving parts must be rendered harmless, etc.)

Class A, B or C

Confined spaces are classified by how dangerous they are for your health. This depends on oxygen levels, fire dangers ("flammability"), and poison dangers ("toxicity").

Class A confined spaces are very dangerous. Their oxygen levels may be low. Explosions may be likely. They may have high levels of toxic gases or chemicals.

Comment [27]: Plagiarized http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf (first written 2004)

Comment [28]: Plagiarized. Mixture of paraphrasing and verbatim from http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf (first written in 2004)

Comment [29]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [30]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [31]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Class B spaces present dangers if proper safety steps are not followed.

Class C spaces have possible hazards, but special work procedures are not necessary.
Only trained persons should decide whether a space is Class A, B or C.

Comment [32]: No, this is incorrect. Berg is quoting a NIOSH document titled “Criteria for a Recommended Standard, dated December 1979. These “classes” were never adopted by OSHA. Berg is teaching things that are just not true.

Prepare Carefully

Always prepare before entering a confined space. Use the right ventilation and Personal Protective Equipment. Make sure all equipment is tested and grounded.

Cut off gas, power, steam or water lines into the confined space. Post a permit stating that you are inside.

Have a qualified person test the air for oxygen, flammability, and toxicity. Test high, low and in the comers.

Have at least one "buddy" outside, connected to you by lifeline. Your buddy should know cardiopulmonary resuscitation ("CPR"), first aid, and how to use safety equipment. Stay in contact with your buddy.

Stay alert and don't smoke or eat while in a confined space.

Comment [33]: Plagiarized from http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf This JCAM document was first written in 2004.

LOCKOUT / TAGOUT OPERATIONS

Disclaimer: This chapter is an overview of Lockout / Tagout operations and is not a complete course. You must attend an official course and pass a test to comply with OSHA Regulations.

Purpose:

When responding to a scene where a machine is contaminated with blood or OPIM, simply unplugging the machine may not be enough. Many serious accidents have occurred when someone thought a machine or the electricity was safely off.

Ensuring Machines Stay OFF

In accordance with the requirements of OSHA regulation 1910.147, Lockout / Tagout ensures that machines and power remain temporarily off. Without a lockout /tagout system, there is the possibility that a machine could suddenly start up, causing injury or death.

Lockout /tagout procedures are employed to lockout energy isolating devices whenever maintenance or servicing is done on machines or equipment. It is used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any cleaning or maintenance.

In most industrial situations, the persons employed by the industrial company will already have a lockout - tagout program in place. By understanding what is required of a program will help the technician to recognize the procedures and make sure they are being properly implemented. In locations where the lockout procedures must be performed solely by the remediation technician, a written remediation company policy and procedure must be in place, and the technician must be trained and equipped to employ the correct procedures.

Lockout is the preferred method of isolating machines or equipment from energy sources. Lockout is defined as the placement of a lockout device on an energy

Comment [34]: This section on Lockout/Tagout is a mixture of plagiarized and paraphrased materials.

Comment [35]: Plagiarization, earliest instance found in https://www.case.edu/ehs/News/archive/Oct94.htm

[redacted] isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

[redacted] Tagout is to be performed instead of lockout ONLY WHEN there is no way to lockout a machine. Tagout is defined as the placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. Machinery and equipment that is not capable of being locked out must be identified as such, and must be tagged out to isolate it.

The OSHA standard does not apply in the following situations:

While servicing or maintaining cord and plug connected electrical equipment, provided that the equipment is unplugged from the energy source; and the plug remains under the exclusive control of the employee performing the servicing and/or maintenance; and

During hot tap operations that involve transmission and distribution systems for gas, steam, water, or petroleum products when they are performed on pressurized pipelines provided that continuity of service is essential, shutdown of the system is impractical, and employees are provided with alternative protection that is equally effective.

Comment [36]: http://www.osh.net/directory/safety/loto.htm

Seven Step to Prepare for Lockout / Tagout

1. Prepare for shutdown. Think, plan and check. Think through the entire procedure. Identify all parts of any systems that need to be shut down. Determine what switches, equipment and people will be involved. Carefully plan how restarting will take place.

2. Communicate. Notify all those who need to know that a lockout / tagout procedure is taking place.

3. Identify all appropriate power sources, whether near or far from the job site. Include electrical circuits, hydraulic and pneumatic systems, spring energy and gravity systems.

additional or increased hazard(s). Neutralize all appropriate power at the source. Disconnect electricity. Block movable parts. Release or block spring energy. Drain or bleed hydraulic and pneumatic lines. Lower suspended parts to rest positions.

5. Lock out all power sources. Use a lock designed only for this purpose. Each technician should have a personal lock and key.

6. Tag out all power sources and machines. Tag machine controls, pressure lines, starter switches and suspended parts. Tags should include your name, department, how to reach you, the date and time of tagging and the reason for the lockout.

7. Do a complete test. Double check all the steps above. Do a personal check. Push start buttons, test circuits and operate valves to test the system to assure it is off.

Comment [37]: Found in a number of companies' safety plans.

Restoring Power

Before lockout or tagout devices are removed and energy is restored to the machine or equipment, certain steps must be taken to reenergize equipment after cleaning is completed, including:

1. Ensuring that machines or equipment components are operationally intact

2. Ensuring that all employees are safely positioned or removed from equipment

3. Ensuring that cleaning equipment, tools, or loose parts are removed from the machine or equipment.

4. Ensuring that lockout or tagout devices are removed from each energy-isolating device by the employee who applied the device.

Use of Tagout ONLY

When the energy-isolating device cannot be locked out, tagout must be used.

When using tagout, the remediation technician must comply with all tagout-related provisions of the standard and, in addition to the normal training required for all employees, must understand the following limitations of tags:

1. Tags are essentially warning devices affixed to energy-isolating devices and do not provide the physical restraint of a lock.

2. When a tag is attached to an isolating means, it is not to be removed except by the person who applied it, and it is never to be bypassed, ignored, or otherwise defeated.

3. Tags must be legible and understandable by all employees.

4. Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.

5. Tags may evoke a false sense of security. They are only one part of an overall energy control program.

6. Tags must be securely attached to the energy-isolating devices so that they cannot be detached accidently during use.

Comment [38]: Plagiarized. http://www.osh.net/directory/safety/loto.htm

[redacted]

[redacted]

SAMPLE TAG


DANGER
DO NOT
OPERATE
THIS TAG & LOCK
TO BE REMOVED
ONLY BY THE
PERSON SHOWN
ON BACK

ORIENTATION TO THE OSHA BLOODBORNE PATHOGENS REGULATIONS

It is important that every remediation technician be familiar with the regulation 29 CFR 1910.1030, and the responsibility an employer has to his/her employees under the law.

Part of the requirements of the regulation include the creation of an Exposure Control Plan by the employer. This plan spells out in detail how the employer intends to reduce bloodborne pathogen exposure, and should an exposure occur, how the employer intends to handle it. By law, the employer must make copies available to the employees both in the office and in each company cleaning vehicle.

Plans may vary from company to company, but each should at the very minimum include the following:

1. provide, free of charge to the employee, equipment and supplies necessary to assist in the abatement of known or potential hazards found in the workplace from bloodborne pathogens.

2. provide a training program that is OSHA compliant.

3. provide, free of charge, medical treatment, post-exposure follow-up and the necessary counseling to employees who have received an occupational exposure to bloodborne pathogens and/or other diseases.

4. maintain training and medical records for each employee.

5. ensure the confidentiality of employees' medical records.

It is YOUR responsibility as an EMPLOYEE to:

1. be informed regarding new information on bloodborne diseases in medical literature.

2. use personal protective equipment as outlined in your employer's "exposure control plan" to reduce the spread of diseases.

3. use 'Universal Precautions' to prevent the spread of diseases. (Universal Precautions is a concept utilizing body substance isolation and barrier protection as a form of protection for workers from bloodborne pathogens and diseases which may be encountered during contact with blood and body fluids.)

4. report any and all exposures and/or injuries as soon as possible.

5. attend mandatory training on bloodborne pathogens offered by the employer (annually).

6. protect and maintain victim and employee medical information confidentiality.

7. maintain personal protective equipment supplies needed in the workplace and report damaged or missing equipment as soon as possible to your employer.

Employees MUST read and understand all aspects of the employer's Exposure Control Plan, and they must sign a document attesting to that fact.

HYGIENE PRACTICES:
In order to minimize exposure to pathogens, regardless of the PPE used, there are certain practices that must be enforced.
HANDWASHING: At the completion of a task, when gloves are removed, it is always a good idea to wash the hands. Anytime blood gets on the skin, whether intact or not, the site should be thoroughly washed immediately with soap and water. If soap and water is not available, an alcohol gel or other antiseptic cleanser may be substituted until washing with soap and water is performed. If there are scabs or sores on the skin, be gentle, avoiding opening these and exposing them to microbial infection.
FUNCTIONS TO AVOID: Whenever you are in an area of biological contamination, or are wearing PPE that has been in contact with the contaminated area, you must NOT:

- Eat or bring food
- Drink or bring drinks
- Apply cosmetics or lip balms
- Smoke

Comment [39]: Generic stuff.

INJURY/EXPOSURE PROCEDURES

Your employer should make sure you know what the company procedures are for handling an injury or exposure. However, the following information is provided as a supplement.

What should be done first? Render appropriate emergency care. If the injury is severe and requires immediate professional care, call 9-1-1 or proceed to the nearest medical facility for treatment.

Then What? Notify your company representative. You should be informed as to what paperwork to fill out. It is important to report the INJURY OR EXPOSURE TO CONTAMINANTS as soon as possible, as treatment should be started promptly.

If this wound came in contact with another's blood or OPIM, this would be a reportable injury/exposure. Post-exposure testing and treatment would need to be started immediately. In any case, wash the wound thoroughly with soap and water, render the appropriate first aid, then notify your employer.

PERSONAL PROTECTIVE EQUIPMENT

[redacted]

[redacted]

N-95 [redacted]

OSHA mandates protection of employees through the use of "engineering and work practice controls". Part of this protection includes the use of Personal Protective Equipment (PPE). Protection is the key to minimizing injury and exposure and the resultant financial and [redacted] legal problems associated with them. When used properly and consistently, PPE provides protection in the form of impenetrable barriers, which if intact, will prevent exposure to sharps, liquids, vapors, gases and airborne particulate. In order to reduce or eliminate the potential for exposure, the routes of exposure must be cut off through the use of barrier material. The most commonly used materials for this task are found in gloves, masks, jump suits, and respiratory filters. These materials are selected and recommended because they can be used once and discarded. This is important because one-time-use products can be discarded with the other hazardous waste, thus eliminating the chance of cross-contamination, or exposing your other laundry to hazards that could be brought home on non-disposable clothing.

Starting from the top of the head, we will address each type of protection, and the proper methods of wearing and removing each article of PPE.

HEAD: Splashes, airborne particulate, vapors and drippings from a ceiling can contaminate the head and hair of a technician if proper precautions are not taken. A hood with an elastic band or drawstring to draw the hood tight about the face is an effective barrier. Disposable coveralls or jumpsuits can be purchased with the hood as an integral part, and provide not only head protection, but continuous protection down the back of the neck as well.

BODY: Splashes, kneeling in fluid, chemicals, airborne particulate, drips, etc. can be a danger by direct exposure of the body. Disposable Jumpsuits or Cover-Alls rated against chemical and vapor penetration are a necessity for the Technician. When worn properly, these suits provide excellent protection. Jumpsuits are designed to be worn over light clothing or underwear. Coveralls are designed larger to accommodate covering street clothing. Most of these suits are non-porous Tyvek or Syranex-coated Tyvek, which means that they are extremely hot to wear. To improve comfort and reduce heat-related illnesses on the job, take breaks often and be sure to stay hydrated.

When working in a full suit, rest frequently and drink plenty of liquids. Only wear suits that are tested and certified by the ASTM test method. This test is recognized as state-of-the-art and is the industry standard for measuring permeation of liquids and gases through protective fabrics. Suits with hoods, elastic wristlets and built-in booties offer the greatest protection.

HANDS: The hands are the most vulnerable. They are exposed to abrasion, puncture, splash, drips, airborne particulate, contact, etc. Therefore, the selection of gloves is paramount to the level of protection needed. Although Vinyl, Latex, Butyl, Neoprene and Nitrile gloves are available, Butyl, Neoprene and Nitrile gloves are recommended as they offer the best overall protection. Latex is the most commonly used glove in the medical field due to its durability and resilient nature, but they are not designed to keep out chemicals. Neoprene and Butyl gloves are designed for handling chemicals and have the greatest strength and resistance to penetration and permeation. If you select Nitrile, select only the heartiest of gloves (6 mil. minimum, 15 mil. preferred), and always wear two pair. Often, gloves will tear. The doubling of gloves affords an extra level of protection.

against exposure due to tearing. Ensure the Nitrile gloves selected are NFPA 1999 certified for high-risk. Select gloves that are long (11" minimum) and designed to offer wrist protection. The wristlet of the glove must overlap the suit sleeve by at least two inches to afford wrist protection. (you may wish to tape the overlap area with chemical resistant tape to avoid slippage and wrist exposure).

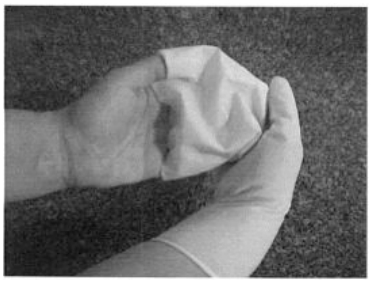
To remove contaminated gloves: (SEE PHOTOS NEXT PAGE)

(1) grasp the cuff of your left glove with the thumb and forefinger of your right hand; (2) pull the left glove down over your hand, causing it to become inside-out as you pull; (3) once it is completely pulled off, it should be inside-out and being held by your right thumb and forefinger; (4) ball the left-hand glove up with your right hand, and hold it there -taking care not to touch anything with your left hand; (5) sliding your left thumb or forefinger under the cuff edge, hook the very edge of the cuff of the right glove; (6) pull the right glove down over your right hand (and the balled-up left glove); (7) continue to pull until the right glove is completely off the hand and is inside-out with the left-hand glove inside it; (8) Dispose of the gloves as hazardous waste; (9) wash your hands.

Kevlar gloves: Kevlar is the same material used in the manufacture of bullet-proof vests. Kevlar gloves are highly resistant to sharp-edged objects such as broken glass, metal shards, or other sharp objects that can cause cuts. They also offer some additional protection against puncture from needles, but they are not designed for puncture protection. Wear the Kevlar gloves between layers of barrier gloves, so that they are protected from both outside contaminants and inside perspiration.

Leather Gloves: Leather gloves can be worn when working around sharp objects. Be sure to wear nitrile or butyl gloves under and over the leather gloves; and if the leather becomes contaminated, they must be discarded as hazardous waste when you are finished.

1



2

3, 4, 5, 6

7, 8

Comment [40]: Berg invented nothing here. The medical industry has used this method of taking gloves off for decades.

FEET: Drips, splashes, and chemical contact can contaminate shoes. Boots and booties offer substantial protection and will provide protection from cross-contamination by eliminating the possibility of tracking contaminants home on the soles of the technician's shoes. Poly rubber/butyl HazMat boots are strong, can come with steel toe and sole protection, and are easily cleaned and disinfected.

RESPIRATORY PROTECTION

Environmental hazards exist on many job sites that you will be expected to clean. Some of these environmental hazards may be airborne on your arrival. Others may be the result of the work you perform, such as spraying antimicrobials or sanding drywall. These often-invisible contaminants can cause severe health problems if you are exposed to them without respiratory protection. Each circumstance may require an evaluation of the risk, followed by the proper selection of a respirator to protect you from harm.

Fit testing is the first step in assuring that the respirator you select will function properly when applied to your individual facial structure. During this time, you will learn the proper method to don a respirator and make the proper fit adjustments to assure maximum protection. The fit test will determine your ability to detect the presence of a test agent. If you can detect this test agent while wearing the respirator during the fit test, then the face seal is not sufficient to provide adequate protection.

Dusts, Fumes and Mists can cause irritation of the respiratory tract. This tract includes the nose, mouth, throat, trachea, and lungs. Tissue damage can occur that may make breathing difficult. Dust particles also can clog the lungs.

Gasses and vapors are generally associated with the use of chemicals or off-gassing of liquids and solids. In addition to causing similar damage as dust, fumes and mists, these toxins may damage other internal organs.

WARNING: Oxygen deficiency in the air can cause unconsciousness and death. Make sure that the environment you are working in is well ventilated. Do not enter confined spaces unless you are trained and the space is monitored by a gas meter.

Filtering Facepiece Respirators are made of fibers that trap and hold hazardous particles.

Air Purifying Respirators use cartridges that contain sorbants that hold gasses or vapors; fibers that trap and hold hazardous particles; or both. It is important to use the specific cartridge designed for the hazard and for your respirator.

Before using your respirator, be sure to read and understand all labels and instructions.

Remember that only a properly fitted respirator will

offer protection. Use only respirators that you have been successfully fit-tested for. Ifthe shape of your face changes (fractures, surgery); or dental configuration changes (dentures, tooth loss) you must be retested for proper fit.

You must also fit test your Air Purifying Respirator prior to each use. First, do a Negative Pressure test by placing the palms of your hands over the openings in the cartridges and try to inhale for ten seconds. Ifthe seal is good, the mask will pull-in toward your face. Next, perform a Positive Pressure test by placing your palms over the exhalation ports of the mask and exhale lightly. Ifthe seal is good, you should feel pressure inside the mask.

[redacted]

Comment [41]: Clearly stolen from http://www.kent.edu/facilitiesplanning/safety/upload/respiratory-protection-brochure.pdf

Comment [42]: Here Berg shows he doesn't know the difference between a fit test and a user seal check.

Please Kent stop teaching respiratory protection before you kill someone.

EQUIPMENT NEEDED FOR REMEDIATION

The following list of equipment and supplies is not intended to be all-inclusive or exclusive. You may find other equipment more appropriate or necessary to complete each unique decontamination venue challenge.

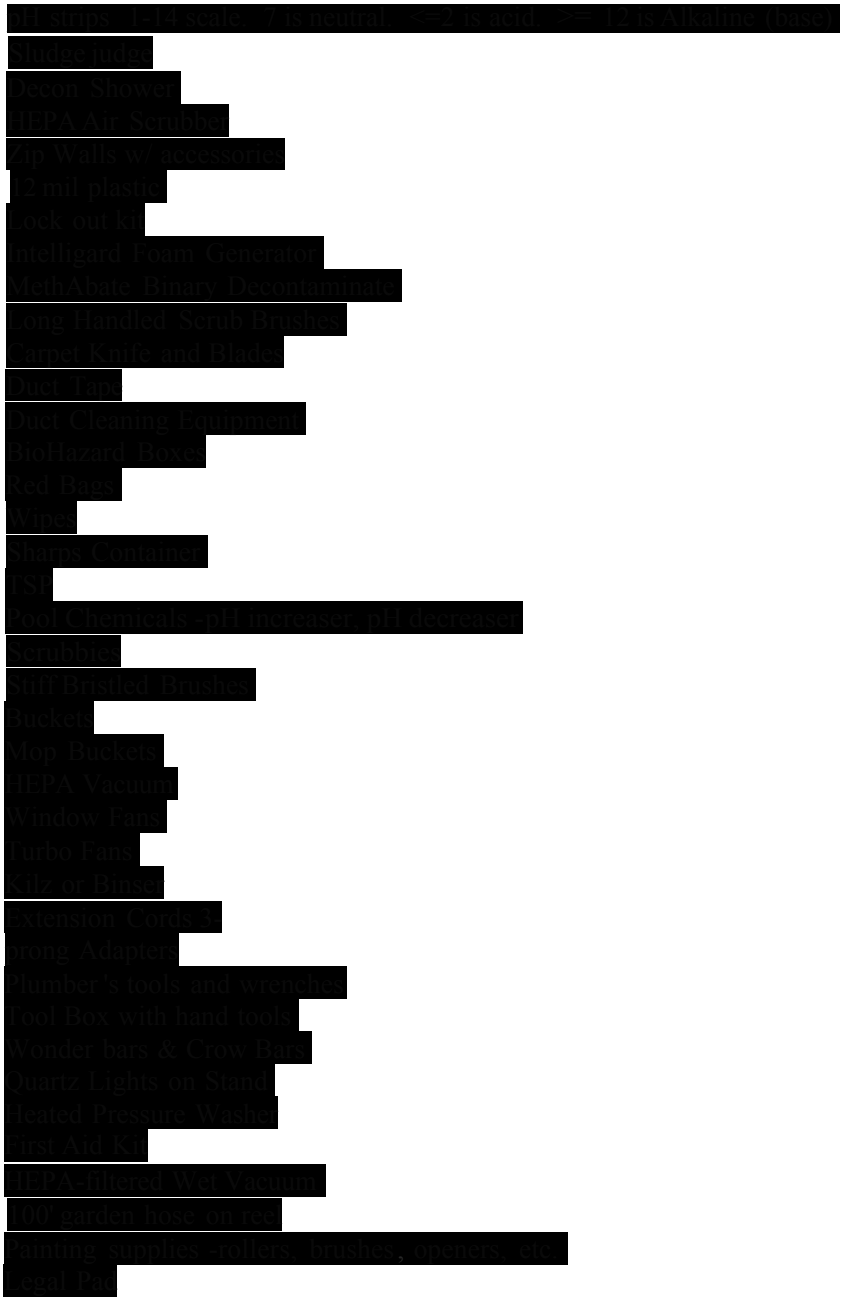
EQUIPMENT

Multi-Gas Meter with PID or FID. What is a PID? A Photo-Ionization Detector measures VOCs and other toxic gases in concentrations from parts-per-billion (ppb) up to 10,000 parts per million (ppm). A PID is a very sensitive broad-spectrum monitor that uses an ultraviolet (UV) light source (photo=light) to break down chemicals to positive and negative ions (ionization) that can easily be measured with a detector. The detector measures the charge of the ionized gas and converts the signal into electrical current. The current is then amplified and displayed on the meter as "ppm." After measurement the ions reform the original gas or vapor. PIDs are non-destructive; they do not "bum" or permanently alter the sample gas, which allows them to be used for sample gathering. They are intrinsically safe so they can be used around low vapor pressure/high flashpoint chemicals. At the scene of a clan lab it is possible for a PID to detect 27 flammable gases and vapors; and 32 toxic gases, vapors, liquids and solids although it may not be immediately obvious what specific chemical(s) are present. PIDs have varying sensitivity to chemicals, so Correction Factors (CF) express the PID sensitivity to a particular gas relative to its calibration gas of isobutylene. To determine 10% Lower Explosive Limit (LEL) in ppm or toxicity in units of isobutylene, the target is divided by the PID correction factor for that chemical. PIDs provide a compact, rugged and reliable means of identifying the presence of and quantifying the threat of gaseous threats in clan labs. When combined with a Wheatstone bridge LEL sensor and electrochemical phosphine sensors, PIDs can form the basis of an integrated continuous gas-monitoring program. The PID depicted here is the MultiRAE PID and Multigas Monitor. It combines PID (0-2000ppm) with four other sensors (02, LEL and two toxic sensors) in one compact monitor to accurately provide warning when toxic and flammable levels of clan lab chemicals are about to be exceeded. Its internal pump provides for fast response and remote monitoring. For clan lab applications, typically the MultiRAE is purchased with ammonia and phosphine sensors installed in the toxic spots.

Comment [43]: Mixture of verbatim, additions, and deletions, plagiarized from the Feb 2004 issue of Occupational Health & Safety Magazine, written by Meg Godfrey. We have her information. Be assured that we have contacted her about this plagiarism.

Ms. Godfrey works for RAE Systems. You will be interested to know that the next paragraph was stolen from RAE.

Comment [44]: Mixture of verbatim, additions, and deletions, plagiarized from http://www.raesystems.com/sites/default/files/downloads/FeedsEnclosure-AP-220_Clan_Labs.pdf, page 7


pH strips 1-14 scale 7 is neutral <=2 is acid >= 12 is Alkaline (base)
Sludge judge
Decon Shower
HEPA Air Scrubber
Zip Walls w/ accessories
12 mil plastic
Lock out kit
IntelligardÂ Foam Generator
MethAbate Binary Decontaminate
Long Handled Scrub Brushes
Carpet Knife and Blades
Duct Tape
Duct Cleaning Equipment
BioHazard Boxes
Red Baags
Wipes
Sharps Container
TSP
Pool Chemicals -pH increaser, pH decreaser
Scrubbies
Stiff Bristled Brushes
Buckets
Mop Buckets
HEPA Vacuum
Window Fans
Turbo Fans
Kiliz or Binser
Extension Cords x3
3prong Adapters
Plumber's tools and wrenches
Tool Box with hand tools
Wonder bars & Crow Bars
Quartz Lights on Stand
Heated Pressure Washer
First Aid Kit
HEPA-filtered Wet Vacuum
100' garden hose on reel
Painting supplies -rollers, brushes, openers, etc
Legal Pad

Pen AND pencil
Any forms you have developed
Digital Still Camera. Video Camera is optional but recommended.
Tyvek suits(elastic wrists, booties, hood.)
Full-Face Respirators with HEPA and OV cartridges Steel
Soled Boots
Nitrile or Neoprene Gloves
Duct Tape
Flashlight
Multi-Gas Meter with PID
Mercury Vapor Analyzer
Lead test wipes
Measuring Tape or Electronic measuring device.
At least one other technician to go with you.
Kit containing: Stainless steel spoon, disposable templates, pH indicator paper, squeeze bottle, disposable plastic pipette, analytical grade methanol, sample collection containers, filter papers, index cards, push-pins, masking tape, permanent ink marking pen, labels for collection containers, pre-moistened hand wipes, zip lock bags, distilled water, paper towels, trash bags, chain of custody seals
Cooler with ice or chemical ice packs

PRE-DEONTAMINATION PHASE

Comment [45]: Berg misspells his own heading. You'd think he'd know how to spell "decontamination."

[redacted]

INITIAL CLIENT CONTACT

Upon receipt of request for clean up, the following information must be obtained prior to Pre-Assessment:

- Physical Location
- Authorizing individual / Agency
- Detailed Directions to the Property
- Initial Meeting Agenda

A signed work authorization form granting permission to commence any action must be obtained from the Property Owner or Authorized Agency who is responsible for reimbursement for services rendered.

PRE-ASSESMENT PHASE

Obtain Case Information from Law Enforcement:

- Case Number
- Copy of Law Enforcement Agency Report
- Point of Contact at Law Enforcement: Name, Phone, Fax, Cell
- Manufacturing method of methamphetamine, i.e. Birch, Cold, etc.
- Chemicals used in production
- Estimated time the lab was in use and level of production
- Name of hazmat transporter responsible for initial gross decon
- Date and Time of gross decon
- Has the property been released by Law Enforcement?

Obtain property information from the local government property office:

- Recorded name of the Legal Owner's Name and mailing address
- Mortgage Company and Insurance Company information
- County Assessor's Information: Parcel Number / Legal Description
- Year Built
- Record of Septic field Map – if applicable

Obtain current disposition of property information from Health or Environmental Regulatory Agency:

- Fit for Occupancy or Unfit
- Health Department Supporting Documentation

Assemble equipment necessary for site assessment:

- Legal Pad

2. Pen AND pencil
3. Any forms you have developed
4. Digital Still Camera. Video Camera is optional but recommended
5. Tyvek suits/elastic wrists, booties, hood
6. Full-Face Respirators with HEPA and OV cartridges
7. Steel-Soled Boots
8. Nitrile or Neoprene Gloves
9. Duct Tape
10. Flashlight
11. Multi-Gas Meter with PID
12. Mercury Vapor Analyzer
13. Lead test wipes
14. Sludge-Judge
15. Measuring Tape or Electronic measuring device
16. At least one other technician to go with you
17. Kit containing: Stainless steel spoon, disposable templates, pH indicator paper, squeeze bottle, disposable plastic pipette, sludge judge, analytical grade methanol, sample collection containers, filter papers, index cards, push-pins, masking tape, permanent ink marking pen, labels for collection containers, pre-moistened hand wipes, zip lock bags, distilled water, paper towels, trash bags, chain of custody seals
18. Cooler with ice or chemical ice packs
19. First Aid Kit

NOTE: Before you perform an on-site assessment, the removal of gross contaminants in the form of lab chemicals and equipment must already have been performed by law enforcement or their bulk chemical removal contractor. After a site has been released and no longer subject to criminal investigation, only then should the remediation technician enter the site. If suspicious containers or lab equipment are found on the property, these items should be left alone and law enforcement contacted.

INITIAL SITE ASSESSMENT

a. Review and Verify Information gathered during Pre-Assessment Phase
b. Conduct Site Assessment using the "buddy system". OSHA requires the use of a second person at any site that is considered a hazardous environment.

The nature and extent of damage and contamination of the residually contaminated portion of the real property should be determined by the on-site supervisor

who shall:

1. Evaluate all information obtained regarding the nature and extent of damage and contamination;

[redacted]

2. Employ procedures to safely enter the residually contaminated portion of the real property in order to conduct a visual assessment;

3. Wear the appropriate personal protective equipment for the condition(s) assessed;

4. Visually inspect the residually contaminated portion of the real property; and perform a Job Hazard Analysis;

5. Be assisted by at least one on-site worker during the initial entry into the residually contaminated portion of the real property;

[redacted]

7. Ifthere was a fire or explosion in the residually contaminated portion of the real property, which appears to have compromised its structural integrity, the drug laboratory site remediation firm shall obtain a structural assessment of the residually contaminated portion of the real property.

8. The on-site supervisor shall conduct and document appropriate testing for corrosive, flammable, combustible, and toxic atmospheres during the initial entry in the residually contaminated portion of the real property, such as an LEL/02 meter, pH paper, PID, FID, or equivalent equipment.

Comment [46]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

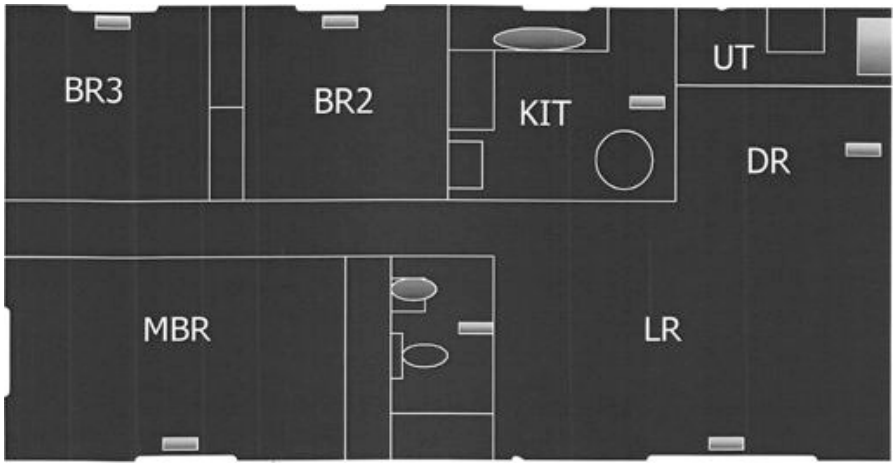
Comment [47]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

Comment [48]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

In Arizona's document, this is step 5.

Comment [49]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

In Arizona's document, this is step 4.



METH CONTAMINATION

HVAC SYSTEM

METH ASSESSMENT

We must presume 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. Finally, it is strongly recommended that all structures on a property where meth labs or chemicals are found be cleaned or sampled. The local authority (if one exists) will make final decisions regarding the need for remediation of non-occupancy structures.

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.

As we have seen in the previous chapter, 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.

Due to lack of health effects information and the fact that research has shown that sampling for meth is not a reliable measure of the entire volume of meth in a structure, it is imperative that the remediation contractor and its technicians rely on a comprehensive and intensive remediation process rather than achievement of a clearance number that is not science-based. The remediation process will reduce risk by reducing exposure to contamination, through a combination of disposal, remediation and encapsulation activities described further in this manual.

[redacted]

Sampling

In order to determine the amount and location of the contamination, it is necessary to perform sampling of the environment. Some states may allow presumptive immuno-assay tests for meth that reveal results on the site, while other states may require the samples to be sent to an authorized laboratory for analysis.

The drug laboratory site remediation firm may need to conduct sampling and /or indicated remediation for all of the compounds listed below. All remediated areas

Comment [50]: Plagiarized (with a few added words) from Clandestine Drug Lab General Cleanup Guidance from the state of Minnesota.

Comment [51]: Plagiarized (with a few added words) from Clandestine Drug Lab General Cleanup Guidance from the state of Minnesota.

Comment [52]: Plagiarized (with a few added words) from Clandestine Drug Lab General Cleanup Guidance from the state of Minnesota.

and materials should meet the following post-remediation clearance levels: (Note: Check your state regulations for their Standard)

Compound	Remediation Standard
Red Phosphorus	Removal of stained material or cleaned pursuant to these stan <lards
Iodine Crystals	Removal of stained material or cleaned pursuant to these stan <lards
Methamphetamine	0.1 µg Methamphetamine/100 cm2
Ephedrine	0.1 µg Ephedrine/100 cm2
Pseudoephedrine	0.1 µg Pseudoephedrine/100 cm2
VOCs in Air	VOC air monitoring < 1 ppm
Corrosives	Surface pH of 6 to 8
LSD*	0.1 µg LSD/100 cm2
Ecstasy*	0.1 µg Ecstasy/100 cm2
	*optional

The drug laboratory site remediation firm should conduct sampling and testing for all of the metals listed below in all cases except where there is clear evidence that these metals were not used in the manufacturing of methamphetamine, LSD, or ecstasy at the drug laboratory: (Check your state regulations for their standard)

Compound	Remediation Standard
Lead	4.3 µg Lead/100 cm2 or 20µg/ft2
Mercury	3.0 µg Mercury/m3 air

To determine the 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, you may get better results sampling:

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-retum just before furnace.

Samples of vertical and horizontal surfaces in the same area will have varied results. Research has shown that levels of meth contamination are increasingly higher on vertical surfaces from floor to ceiling. When wipe sampling vertical or

Comment [53]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

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 meth 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.

Comment [54]: Plagiarized (with a few added words) from Clandestine Drug Lab General Cleanup Guidance from the state of Minnesota.

Sampling procedure
All sampling and testing shall be conducted in accordance with the following procedures:
a. All sample locations shall be photographed , and the photographs shall be included in the final report.
b. All sample locations shall also be shown on a floor plan of the residually contaminated portion of the real property, and the floor plan shall be included in the final report.
c. All samples shall be obtained from areas representative of the materials or surfaces being tested. All samples shall be obtained, preserved , and handled in accordance with industry standards for the types of samples and analytical testing to be conducted and maintained under chain-of-custody protocol.
d. The individual conducting the sampling shall wear a new pair of gloves to obtain each sample.
e. All reusable sampling equipment shall be decontaminated prior to sampling.
f. All testing equipment shall be properly equipped and calibrated for the types of compounds to be analyzed.
g. Methamphetamine, ephedrine, pseudoephedrine, ecstasy, and/or LSD sampling and testing:

Comment [55]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

To determine the extent of contamination on non-porous surfaces (tile, linoleum, drywall, finished wood, metal, formica, etc.), a technique known as "wipe" sampling is used. On porous areas, such as carpet or drapes, wipe or micro-vacuum sampling techniques are only satisfactory for a qualitative (absence or presence) identification of the chemical.

Paper filters are generally used for collection of metals. Mixed cellulose ester filter discs (AA filters) or smear tabs, or their equivalent, are most often recommended. Polyvinyl chloride filters are available for

substances that are unstable on paper-type filters. Squares of a gauze material may be used for many organic substances, and have the advantage of being more durable than filter media, especially when wiping rough surfaces. They may be used dry, or wetted with deionized water or solvent (methanol) to enhance collection efficiency.

The following procedure is recommended for collecting wipe samples:

1. Ifmultiple samples are to be taken at the worksite, prepare a rough sketch of the area to be wipe sampled.
2. A new set of clean, impervious gloves should be used for each sample to avoid contamination of the filter by previous samples (and the possibility of false positives) and to prevent contact with the substance.
3. Withdraw the filter from the vial with your fingers or clean tweezers. If a damp wipe sample is desired, moisten the filter with distilled water (lead samples) or other solvent (methanol for meth samples) as recommended.
4. Depending on the purpose of the sample, it may be useful to determine the concentration of contamination (e.g., in micrograms of agent per area). For these samples, it is necessary to record the area of the surface wiped (e.g., 100 cm2). This would normally not be necessary for samples taken to simply show the presence of the contaminant.
5. Firm pressure should be applied when wiping.
6. Start at the outside edge and progress toward the center of the surface area by wiping in concentric squares of decreasing size; OR by wiping five strokes in a

Comment [56]: http://mihsweb.org/media/TN_Meth_RAP_Guidance_published_8-20-04.pdf

Plagiarized from Tennessee Department of Environment & Conservation (Interim Guidance, August 20, 2004) Reasonable, Appropriate, Protective (RAP) Cleanup Response and Documentation Guidelines for Properties Quarantined due to Clandestine Drug Laboratory (CDL) Activities pursuant to P. Ch. 855 of the Acts of 2004.

"Z" pattern, first horizontally, then five strokes in an "N" pattern vertically.
7. Without allowing the filter to come into contact with any other surface, fold the filter with the exposed side in. Ifpossible, use the same filter to repeat the sampling of the same area, then fold it over again. Place the filter in a sample vial, cap and number it, and note the number at the sample location on the sketch. Include notes with the sketch giving any further description of the sample.
8. At least one blank filter treated in the same fashion, but without wiping, should be submitted for each sampled area.
i. Whatman 40 ashless filter paper or equivalent, or squares of sterile gauze material may be used for all wipe sampling. The filter paper shall be wetted with analytical grade methanol for the wipe sampling. The filter paper shall be wiped at least five times in two perpendicular directions within each sampling area. The same filter paper may be used for up to three wipe areas or a new filter paper may be used for each area, and the three filter papers combined for analytical testing.
ii. Three 10 cm x 10 cm areas (100 cm2) shall be wipe sampled from each room of the residually contaminated portion of the real property. The three samples shall be obtained from the non-porous floor, one wall, and the ceiling in each room.
iii. Three 10 cm x 10 cm areas (100 cm2) shall be wipe sampled from different areas of the ventilation system.
iv. Ifthere is a kitchen in the residually contaminated portion of the real property, three 10 cm x 10 cm areas (100 cm2) shall be wipe sampled from a combination of the counter top, sink, or stove top, and from the floor in front of the stove top.
v. Ifthere is a bathroom in the residually contaminated portion of the real property, three 10 cm x 10 cm areas (100 cm2) shall be wipe sampled from a combination of the counter top, sink, toilet, and the shower/bath tub.
vi. Ifthere are any cleaned appliances in the residually contaminated portion of the real property, one 10 cm x 10 cm area (100 cm2) shall be wipe sampled from the exposed portion of each appliance. Ifmultiple appliances are present, each wipe sample may be a composite of up to three 100 cm2 areas on three separate appliances.
vii. After sampling, the wipe sample shall be placed in a new clean sample jar and sealed with a teflon-lined lid. The sample jar shall be properly labeled with at least the site or project identification number, date, time, and actual sample location. The sample jar shall be placed in a cooler with ice until delivered to an analytical laboratory licensed in any state in the United States to perform GC/MS testing. The sample shall be analyzed for methamphetamine, ephedrine, pseudoephedrine, LSD, and/ or ecstasy, depending upon the type of clandestine drug

Comment [57]: Plagiarized. Berg changed "S" in the original to "Z" and "N". http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=Content-Disposition&blobheadername2=Content-Type&blobheadervalue1=inline%3B+filename%3D%22Regulations+pertaining+to+the+Cleanup+of+Methamphetamine+Laboratories.pdf%22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251855687340&ssbinary=true (2005)

laboratory, using a Ge/MS instrument, or equivalent.

h. voc sampling and testing procedures:

i. A properly calibrated PID or FID capable of detecting VOes shall be used for testing. The background concentration of VOes 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 VOes. All voe readings shall be recorded for each sample location.

ii. At least three locations in each room of the residually contaminated portion of the real property shall be tested for VOe readings. The testing equipment probe shall be held in the sample location for at least 30 seconds to obtain a reading; and

iii. All accessible plumbing traps shall be tested for VOes by holding the testing equipment probe in the plumbing pipe above the trap for at least 60 seconds.

1. pH testing procedures:

i. 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.

ii. 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.

iii. 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.

iv. 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.

j. Lead Sampling and Testing Procedures:

i. Unless there is clear evidence that lead was not used in the manufacturing of methamphetamine, LSD, or ecstasy at the clandestine drug laboratory, lead sampling shall be conducted as follows:

(1) Whatman 40 ashless filter paper or equivalent shall be used for wipe sampling. The filter paper shall be wetted with analytical grade 3% nanograde nitric acid for the wipe sampling. The filter paper shall be blotted or wiped at least five times in two perpendicular directions within each sampling area. The same filter paper may be used for up to three wipe areas or a new filter paper may be used for each area and the three filter papers combined for analytical testing;

(2) Three 10 cm x 10 cm areas (100 cm2) shall be sampled in each room within the areas with visible contamination or within areas known to store or handle chemicals used for the clandestine drug laboratory in the residually contaminated portion of the real property; and

(3) After sampling, the wipe sample shall be placed in a new clean sample jar and sealed with a teflon-lined lid. The sample jar shall be properly labeled with at least the site or project identification number, date, time, and actual sample location. The sample jar shall be placed in a cooler with ice until delivered to a licensed analytical laboratory.

ii. The sample shall be analyzed for lead using EPA Method 601OB or equivalent.

k. Mercury Sampling and Testing Procedures:

i. A properly calibrated mercury vapor analyzer shall be used for evaluating the remediated areas for the presence of mercury. All mercury readings shall be recorded for each sample location.

ii. At least three locations in each room within the areas with visible contamination or within areas known to store or handle chemicals used for the clandestine drug laboratory in the residually contaminated portion of the real property shall be tested for mercury vapor readings. The testing equipment probe shall be held in the sample location for at least 30 seconds to obtain a reading.

iii. All accessible plumbing traps shall be tested for mercury by holding the testing equipment probe in the plumbing pipe above the trap for at least 60 seconds.

l. Septic Tank and/or Well Water Sampling and Testing Procedures: If obvious staining of plumbing fixtures is evident on a property utilizing a septic system, conduct samples of sludge, grey water and scum.

i. The liquid in the septic tank shall be sampled with a new clean bailer or similar equipment.

ii. Conduct Well water samples -Three Sets: Well Head, Kitchen Tap, and Bathroom Tap.

iii. The liquid shall be decanted or poured with minimal turbulence into three new VOA vials properly prepared by the laboratory.

iv. The VOA vials shall be filled so that there are no air bubbles in the sealed container. If air bubbles are present, the vial must be emptied and refilled;

(1) The sample vials shall be properly labeled with at least the date, time, and sample location;

(2) The sample vials shall be placed in a cooler with ice until delivered to a licensed analytical laboratory; and

Comment [58]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

Comment [59]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

(3) The sample shall be analyzed for acetone and methanol using EPA Method 8015B or equivalent.

NOTE: Should an Industrial Hygienist be utilized, he/she shall have the ultimate decision as to location and type of method used. Regardless of method, it shall be annotated within the written work plan as to the method utilized as well as the results thereof.

SAMPLING RESULTS

Once you have taken your samples, they may be sent to a certified laboratory for evaluation. Most laboratories will provide all of the sampling paper, vials, paperwork (see sample), and even a cooler to ship the samples in. Fill out the appropriate paperwork, package the samples (on ice if necessary), and ship them to the designated lab. Most labs offer testing services on regular and expedited service plans that take from a few days to over a week for results. When the results do come in, they must be evaluated by you to determine the concentration of contamination and the location of the contamination. These results will assist you in composing a work plan. (See lab report sample.)

Comment [60]: Plagiarized from the Arizona State Board of Technical Registration's R4-30-305, *Drug Laboratory Site Remediation Best Standards and Practices*, found at least as far back as 2003.

A written work plan shall be prepared by the project manager and presented to the Property Owner for approval prior to commencement of any work past the Pre-cleanup Site Assessment. The Property Owner must sign the written work plan prior to submission to the local health agency for approval (if required).

The Property Owner shall be consulted as to what items if any should be salvaged. The work plan shall also list any items that must be destroyed. The PO shall also be advised of the additional costs that may be incurred in attempting to salvage certain items and that cleaning does not always conclude in a satisfactory remediation and could still result in the destruction of the item to prevent health issues.

Sample Work Plan:

1. The name, address, and contact information of the remediation company and the state registration number of the firm should be on the first page of the plan.

2. Timeline - The timeline should identify the key work elements below, indicate the estimated time to complete each element, and show start/end time estimates for each element

3. Location – Street address and mailing address of the contaminated property, owner of record and his/her mailing address, legal description, county tax or parcel identification number, or vehicle identification number if a mobile home, and clear directions for locating the property.

4. Site Map -Photographs and diagrams of the contaminated property including floor plans of affected buildings, local drinking water wells and nearby streams drawn to a reasonable scale as determined by the local health department. The diagram shall show the location of damage and contamination and the location of sampling points used in the site assessment.

5. Preliminary Assessment Summary -A summary of the information obtained from the appropriate agency (ies) such as law enforcement and the local health department, including a discussion of the information's relevance to the contamination.

Comment [61]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

6. A list of emergency contacts and telephone numbers, and the route and location of the nearest hospital with emergency service facilities.

7. Cleanup Procedures – Specific cleanup procedures will include a list of:
Any and all materials to be removed and the removal procedures.
All proposed cleanup processes.
All processes used to cover or encapsulate contaminants.
All containment and negative pressure enclosure plans.
All procedures for characterizing contaminated materials.

8. Waste Disposal Plan -A waste disposal plan shall be included in the work-plan. Materials (building structures, clothes, furniture, et cetera) inside the drug lab and the structure housing the lab may have been contaminated by the process of manufacturing drugs. The contractor must determine whether or not the waste generated during the cleanup is dangerous waste as set forth by the state or local health department or solid waste enforcement agency.

Knowledge obtained from the pre-cleanup screen and/or pre-cleanup site assessment may be used to help designate the waste generated during the cleanup. Under the plan, waste should be segregated into two groups: visibly stained/ contaminated and visibly clean. A representative sample must be taken from each group. The plan shall include a detailed description of the sampling method. These samples shall be tested and analyzed following the protocols as established by the local health department or State agency.

The plan shall identify the permitted "Temporary Storage and Disposal" (TSD) facility that will be used in the event dangerous waste is generated. The dangerous waste must be manifested and transported in agreement with any National, State or Local guidelines

Ifthe waste is not designated as dangerous waste, it is solid waste and may be disposed of at a permitted solid waste landfill. The local health department must be contacted prior to disposal of this solid waste to determine if a specific permit is required for disposal at landfills under its jurisdiction. The permitted landfill shall be identified.

If the contractor proposes to dispose of the structure by burning, permission must be obtained in writing from the local health department, local air pollution control authority, and the local fire department.

Comment [62]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

9. The work plan should include, but not be limited to: air, non-porous surface, soil and water sampling results. Including a statement that sampling and testing results were performed using recognized standards and written procedures designed to ensure accuracy, reproducibility, and relevance to onsite contamination

List tests and their results if indoor air was tested for VOC's and airborne mercury, horizontal surfaces tested for lead or other compounds were tested for, as deemed necessary by the local health department.

The testing components of the assessment should include:

A. The exact location within the property where each test sample was or will be collected;
B. The materials, equipment and techniques used or proposed for sampling at each location;
C. The amount of area, and/or volume of material collected for each test sample;
D. All control samples taken or to be taken, including the location, materials, techniques and results;
E. All sample test results must be reported in parts per million (ppm) or parts per billion, e.g., weight/weight (mg/kg) or weight/volume (fig/m3) units consistent with the kind of sample tested;
F. Surface sample test results must be reported as total weight of contaminant per appropriate unit of area, e.g., weight/surface area (µg/ft2);
G. During each sample collection, identical methods must be used;
H. The name, location, mailing address, and the licenses, registrations, or certifications of laboratories performing the work.

All sample reports should be retained by the contractor and stored for a period of not less than three calendar years from the date of collection.

The sampling and analytical methods will follow the procedures outlined in the Appendix. When applicable, laboratory tests will be performed by a laboratory having both a U.S. Drug Enforcement Administration (DEA) registration and a certification from the state health department.
Selection of chemicals to be analyzed will be determined by:
A. Chemicals found on site (labeled containers, detected analytically);
B. Chemicals implied by reference (e.g., methods of manufacture indicate a high probability of presence; and

Comment [63]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

Comment [64]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

C. Long term health effects (e.g., mercury vapor).

10. Contractor Statement of Qualifications – The statement of qualifications must include a listing of all on-site personnel qualifications, state drug lab cleanup certification, and training under applicable Occupational Safety and Health Administration (OSHA) Rules (29 CFR 1910.120) and any applicable State regulations as necessary.

11. Worker Health and Safety Plan -The worker health plan must conform to state or local health guidelines as applicable. The plan shall include selection and use of PPE and personnel decontamination procedures to be used.

12. The shoring plan, if an assessment of the structural integrity was conducted and it was determined that shoring was necessary.

13. A complete list of the proposed post-decontamination testing of the residually contaminated portion of the real property and the name(s) of the individual(s) conducting the sampling and the laboratory(ies) performing the analytical testing.

The written work plan shall be:

a. Approved in writing by the owner of the real property or the owner's agent.
b. Under provisions of most states, the workplan must be submitted to the local health department with jurisdiction over the workplan, for review and approval. When governed by local or State authorities the contractor must have written approval from said department prior to implementation of the work plan.
c. Retained by the remediation firm for a minimum of three years.

If during the cleanup it becomes necessary to modify the approved plan, written application must be made to the local health department. When governed by local or State authorities the contractor must have written approval from the local health department before proceeding with the modified work plan.

Comment [65]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

Comment [66]: Plagiarized from Arizona's R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices, found as early as 2003.

Comment [67]: Plagiarized from Washington State Department of Health, Office of Toxic Substances, *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

Berg swapped out "RCW 64.44.050" in the original document with "of most states."

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

Comment [68]: Plagiarized from Arizona's R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices, found as early as 2003.

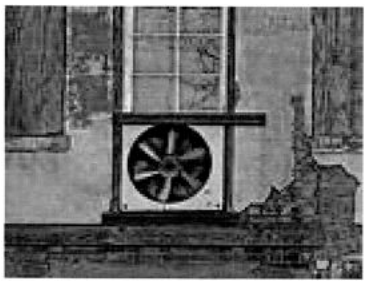
Comment [69]: Plagiarized from *Guidelines For Contamination Reduction And Sampling At Illegal Drug Manufacturing Sites*, available at least as early as 1996.

http://www.co.mason.wa.us/forms/Env_Health/CDLGUIDELNS.pdf

DECONTAMINATION

DAY 1

Airing Out (Venting)



When solvents and other chemicals that may have soaked into the walls or furnishings are slowly volatilizing indoors, proper ventilation may safely reduce contamination and decrease odors. Venting should be conducted for at least two days before cleanup begins to allow volatile compounds to be dispersed, and good ventilation should be maintained during all phases of the cleanup. Care must be taken to ensure that vented contaminants are exhausted to the outdoors and not to the air intakes of adjacent structures. Windows should be opened and exhaust fans set up to circulate air out of the structure. During this time, the property should remain off limits unless it is absolutely necessary to make short visits to the property. In some cases it may be beneficial to raise the indoor air temperature to approximately 85F for 48 to 72 hours to enhance volatilization. This should be done only after an initial period of venting, and after all bulk chemicals have been removed from the property. Monitoring of the indoor atmosphere should be conducted to ensure that vapor levels do not approach a level that would pose an explosion hazard (lower explosive limit). Avoid operating the HVAC system during cleaning.

DAY 3 or 4

INITIATING THE DECONTAMINATION

A. Upon arrival at the scene with your crew, you must establish a plan of action that is conveyed to each technician.

1. Establish your hot, warm, and cold zones.

2. Set up your decontamination area. Hook up water hose for decon and eye wash.

3. Establish where your rehab and first aid area will be and place your first-aid equipment and environmental normalization equipment (heating, cooling).

4. Deliver "Meth Lab Right-to-Know" training or ensure that all workers on site have had training within past 12 months.

Comment [70]: Plagiarized from page of 4 of Cleanup of *Clandestine Methamphetamine Labs Guidance Document*, Colorado Department of Health and Environment, 2003.

Comment [71]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

5. Assign technicians to tasks and assign whom they are to report to

6. Stage your equipment

B. Remediation procedures for the residually contaminated portion of the real property.

1. All clandestine drug laboratory site remediation firms, on-site supervisors, and on-site workers need to comply with all applicable federal, state, municipal, and local laws, rules, ordinances, and regulations during the remediation of the residually contaminated portion of the real property.

2. An on-site supervisor needs to be present on the residually contaminated portion of the real property during the performance of remedial services.

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.

• 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.

Comment [72]: Plagiarized. Mixture of verbatim, additions and deletions but clearly from Arizona's **R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices,** found as early as 2003.

• 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.

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

Comment [73]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

Berg merely changed a couple of words; for example, in the original it reads “INTERIOR CLEANUP PROCEDURES
Cleanup Steps”

Comment [74]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

Berg got a little sloppy here. He even kept in “(see Appendix C3)” from the original document. There is no Appendix C3 in Berg’s “book.” He merely copied and pasted and forgot to delete.

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.

Ventilation Cleaning Procedures

Ventilation systems tend to collect fumes and dust and redistribute them throughout a structure. 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 cleanup 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 low levels or no contamination.

a. Air registers shall be removed and washed with a detergent and water solution and then thoroughly rinsed. This cleaning procedure shall be repeated at least two additional times using new detergent solution and rinse water.
b. Temporary filter media shall be attached to air register openings.
c. A fan-powered HEPA filter collection machine shall be connected to the ductwork to develop negative air pressure in the ductwork.
d. Air lances, mechanical agitators, or rotary brushes shall be inserted into the ducts through the air register openings to loosen all dirt, dust and other loose materials.
e. The air handler unit, including the return air housing, coils, fan(s), system (s), and drip pan, shall be washed with a detergent and water solution and then thoroughly rinsed. This cleaning procedure shall be repeated at least two additional times using new detergent solution and rinse water.
f. All porous linings or filters in the ventilation system shall be removed and properly disposed of.
g. The ventilation system shall be sealed off at all openings with at least 4-mil plastic sheeting to prevent recontamination until the residually contaminated portion of the real property meets the post-remediation clearance level.

Evaluation of Chemical Spills

All food preparation counter-tops, stained materials, powders and liquids throughout the structure should be tested to determine their corrosivity, toxicity, and flammability. In cases where acids or bases are known to be sources of contamination, the potential for harmful effects may be reduced or removed through neutralization. Acids may be neutralized with solutions of sodium bicarbonate (baking

Comment [75]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
April 3, 2007

Comment [76]: Plagiarized from Cleanup of Clandestine Methamphetamine Labs Guidance Document, July 2003, Colorado Department of Public Health and Environment

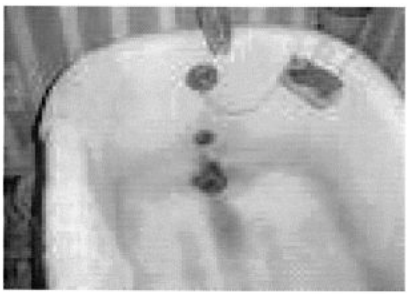
Comment [77]: Plagiarized from Arizona's R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices, found as early as 2003.

soda), and bases may be neutralized by using weakly acidic solutions of vinegar or acetic acid in water. Solids should be scooped up and packaged for disposal. Liquids can be absorbed with clay or other non-reactive material and packaged for disposal. If the property is on a septic tank system, the tank liquid should be tested to determine if it contains meth lab related chemicals. If meth lab chemicals are present, the contents of the tank should be disposed of as either a solid or hazardous waste, based on the results of analysis. Analysis of the septic tank contents should be based on chemicals determined to be part of the lab site chemical inventory (developed as part of the preliminary assessment).

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.

Value and Contact-Potential Evaluation



High Value -High Contact Items
E.G., Mattresses, carpeting, large upholstered items should almost always be discarded. (See exceptions in text.)

High Value -Low Contact Items
E.G., In some circumstances, photographs may be salvaged without cleaning, or large appliances may be cleaned and saved

Low Value-High Contact Items
E.G., clothing, plastic toys and toothbrush should always be discarded. (See exceptions in text.)

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.

Household contents and guidance for their disposition are listed below. The list is not exhaustive. Recommendations for household contents are divided into three categories:

Comment [78]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

Berg managed to leave out "(see Appendix C3)" this time.

Comment [79]: And now we're back to plagiarizing from **Cleanup of Clandestine Methamphetamine Labs Guidance Document**, July 2003, Colorado Department of Public Health and Environment.

Comment [80]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

Always Discard and Disposal Strongly Recommended and Disposal Recommended.

• 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:

D 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 clothmg.

D Fabric Goods: Non-Washable , Such as Woolens, Rubber-Backed Draperies
Always Discard.

D Mattresses
Disposal Strongly Recommended.
Exceptions: (See Appendix) 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.

D Carpeting
Always Discard.

• Kitchen Goods:

D 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.

D Small Wooden, All Plastic Kitchen and Household Items
Always Discard.

• Furniture:
D 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.

D 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 appropriate clearance levels on 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.

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.

Any wooden counter or food preparation surface must be removed and disposed of. There are no exceptions.
Hard, non-porous 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, re-grouted and sealed. A post-remediation sample indicating greater than or equal to 1 µg meth per square foot (>1 µg/ft2) (or your state's clearance level) 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). 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.

8. Procedures for Plumbing, Septic, Sewer, and Soil.

a. All plumbing inlets to the septic/sewer system, including but not limited to sinks, floor drains, bath tubs, showers, and toilets, shall be visually assessed for any staining or other visible residual contamination. All plumbing traps shall be assessed for VOC concentrations with a PID or FID, and for mercury vapors, by using a mercury vapor analyzer. If VOC concentrations or mercury vapor concentrations exceed the post-remediation clearance levels, the accessible plumbing and traps where the excess levels are found shall be removed and properly disposed of, or shall be cleaned and tested to meet post-remediation clearance levels.

b. The on-site supervisor shall determine if the dwelling is connected to a local sewer system or to an on-site septic system. If the dwelling is connected to an on-site septic system, a sample of the septic tank liquids shall be obtained and tested for voe concentrations.

i. If VOCs are not found in the septic tank sample or are found at concentrations less than 700 micrograms per liter (mg/I) for acetone, no additional work is required in the septic system area, unless requested by the owner of the real property.

ii. If VOCs are found in the septic tank at concentrations exceeding

Comment [81]: This entire highlighted section is almost word-for-word from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health Minnesota Pollution Control Agency, April 2, 2007

700 mg/I for acetone the following shall apply:

(1) The discharge area such as the leach field, seepage pit, and evaporation mounds shall be investigated under the direct supervision of a registered geologist or a registered engineer;

(2) The septic system discharge area shall be investigated for voes and unless there is clear evidence that mercury or lead was not used in the manufacturing of methamphetamine, LSD or ecstasy at the clandestine drug laboratory, the septic system discharge area shall also be investigated for mercury and lead;

(3) The vertical extent of any VOes, mercury, and lead detected in the soil samples shall be delineated to concentrations below laboratory detection limits or to background concentrations, and the horizontal extent of the voes, mercury and lead shall be delineated to concentrations below each compound's SRL;

(4) If any of the voes, mercury, and lead used by the clandestine drug laboratory migrated down to groundwater level, the extent of groundwater contamination shall also be investigated under the direct supervision of a registered geologist or a registered engineer and the vertical and horizontal extent of the groundwater contamination shall be delineated to concentrations below the AWQS or below 700 mg/l for acetone; and (5) After complete characterization of the release, the impacted soils shall be remediated to concentrations below the SRL or background concentrations, and any impacted groundwater shall be remediated to concentrations below the AWQS or below 700 mg/I for acetone.

Comment [82]: And now we are back to plagiarizing from Arizona's **R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices,** found as early as 2003.

You know that Ventilation section up on page 91? Well, this section on Plumbing just happens to be the next section in Arizona's document. Just mixing and matching documents doesn't mean it's not plagiarism.

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:

0 Ventilate structure before cleaning.

0 Inspect for stains and meth lab materials.

D Discard porous low value contents.

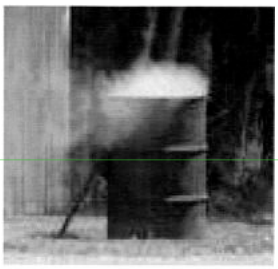
D When there is a dirt floor in the building, remediation must be based on assessment. In some cases, it may be necessary to scrape and dispose an inch or more of dirt floor.

0 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.



D Spray paint or sealant on all surfaces.

Contents within outbuildings vary in degree of human contact and ease of cleaning. Ifa 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.

After clean-up, the property should be aired out for three to five days. Then the property should be checked for re-staining or odors, either of which would indicate that the initial cleaning was not successful and that more extensive steps

Comment [83]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health Minnesota Pollution Control Agency January 1, 2006

Comment [84]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health Minnesota Pollution Control Agency, April 2, 2007

Comment [85]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health Minnesota Pollution Control Agency January 1, 2006

should be taken.

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.

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.

Dump Sites and Bum Pits

The on-site supervisor shall observe the real property for evidence of bum areas, bum or trash pits, debris piles or stained areas. It is important to tie site characterization to the chemical storage and waste disposal information gathered on the site to ensure that assessment efforts look for potential contaminants in the places they are likely to be. This type of information can be gathered from observations made by law enforcement or hazmat personnel, or by conducting a site tour to note the property's condition, looking for evidence of contamination such as stained soil or stressed (dead or dying) vegetation.

It is important to evaluate both natural features and manmade structures, such as drainage systems, local topography, utilities, c. surface water bodies, easements and locations of buildings, because these features can influence the migration of contaminants and restrict access to portions of the site during remedial efforts.

This information is used in conjunction with information regarding the subsurface characteristics at the site to evaluate contaminant migration pathways.

The amount of information that may need to be gathered will depend largely upon the characteristics of the release and the local hydrogeology. Relatively immobile contaminants (such as metals) that may have been released onto the ground surface will require considerably less subsurface data collection than a release involving relatively mobile contaminants (such as solvents). The subsurface characteristics will need to be defined to the degree necessary to provide a clear understanding of potential migration pathways for the purpose of defining the extent of contamination. Any bum areas, bum or trash pits, debris piles or stained areas should be tested with appropriate testing equipment, such as, a LEL/02 meter, pH

Comment [86]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health September 2003

Comment [87]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance Minnesota Department of Health Minnesota Pollution Control Agency January 1, 2006

Comment [88]: Plagiarized from Arizona's R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices, found as early as 2003.

Comment [89]: Plagiarized from *Cleanup of Clandestine Methamphetamine Labs Guidance Document*, Colorado Department of Health and Environment, 2003.

paper, PID, FID, mercury vapor analyzer or equivalent equipment.

Ifthe bum areas, bum or trash pits, debris piles, or stained areas are not part of the residually contaminated portion of the real property, the drug laboratory site remediation firm shall recommend to the owner of the real property that these areas be investigated.

Ifthe bum areas, bum or trash pits, debris piles or stained areas are part of the residually contaminated portion of the real property, these areas shall be investigated and remediated by the drug laboratory site remediation firm.

1. Any wastes remaining from the operation of the clandestine drug laboratory or other wastes impacted by compounds used by the clandestine drug laboratory shall be characterized, removed, and properly disposed of.

(2) Any potentially impacted soil and/or groundwater may need to be investigated under the direct supervision of a registered geologist or a registered engmeer.

(3) The bum areas, burn or trash pits, debris piles, or stained areas shall be investigated for the voes used by the drug laboratory. Unless there is clear evidence that mercury or lead was not used in the manufacturing of methamphetamine, LSD, or ecstasy at the clandestine drug laboratory, the bum areas, bum or trash pits, debris piles, or stained areas shall be investigated for lead and mercury.

(4) The vertical extent of any VOes, lead, or mercury detected in the soil samples shall be delineated to concentrations below laboratory detection limits or to background concentrations. The horizontal extent of these compounds shall be delineated to concentrations below each compound's SRL.

(5) If any of the compounds used by the clandestine drug laboratory migrated down to groundwater level, the extent of groundwater contamination shall also be investigated under the direct supervision of a registered geologist or a registered engineer. The vertical and horizontal extent of the groundwater contamination shall be delineated to concentrations below 700 mg/l for acetone.

(6) After complete characterization of the release, the impacted soils shall be remediated to concentrations below the SRL or background concentrations, and any impacted groundwater shall be remediated to concentrations below the state water quality standards or below 700 mg/l for acetone.

CHECK WITH YOUR STATE REGULATORY AGENCY FOR STANDARDS IN YOUR AREA. FOR COMPOUNDS THAT DO NOT HAVE ESTABLISHED CLEANUP LEVELS, A PROPERTY OWNER MAY PROPOSE THE USE OF AN APPROPRIATE CLEANUP LEVEL FOR SOIL, USING EITHER BACKGROUND CONCENTRATION OR THE DETECTION LIMIT METHOD.

Comment [90]: Plagiarized from Arizona's R4-30-305. Drug Laboratory Site Remediation Best Standards and Practices, found as early as 2003.

Comment [91]: Plagiarized from *Cleanup of Clandestine Methamphetamine Labs Guidance Document*, Colorado Department of Health and Environment, 2003.

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. Ifthe 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.

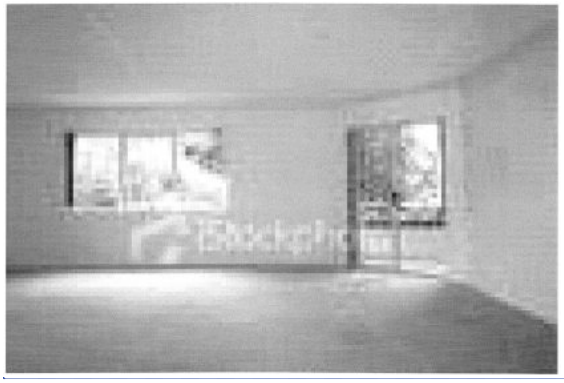
M. Burning a Meth-Contaminated Structure
Burning a meth-contaminated structure for fire service training in lieu of remediation is strongly discouraged. Safety of firefighter entry into a former meth lab structure and effectiveness of decontamination of firefighter equipment cannot be assured. In all cases of a practice or training burn, the burn must be done in accordance with demolition and asbestos regulations. Your state may require special permits prior to a training or practice burn.

Comment [92]: Plagiarized from Clandestine Drug Lab General Cleanup Guidance
Minnesota Department of Health
Minnesota Pollution Control Agency
January 1, 2006

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 your state regulations. If final clearance sampling is required, it should be performed by Certified Industrial Hygienist, a Certified Safety Professional, registered geologist or registered engineer NOT UNDER THE EMPLOY OF YOUR COMPANY. The final report should 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 generally considered closed until the local authority has approved the final report. Ifthe work was not completed in accordance to the guidance, the contractor may be liable to the property owner for additional remediation costs and attorney fees for as many as six years after verification.

In some states, at the time that a clandestine lab is discovered, the local authority may be 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 may have to 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.



Comment [93]: Copyright Infringement. One can clearly see the iStockphoto watermark in this image which proves Berg did not purchase the rights to use this photo. This is no different than him going in the photographer's wallet and taking money out; it's theft.

APPENDIX

Comment [94]: These are OSHA regulations. Berg did not write any of these. Again, he is benefitting off of the work of others.

Regulations (Standards - 29 CFR) Hazardous waste operations and emergency response. - 1910.120
Regulations (Standards - 29 CFR) - Table of Contents
• Part Number: 1910
• Part Title: Occupational Safety and Health Standards
• Subpart: H
• Subpart Title: Hazardous Materials
• Standard Number: 1910.120
• Title: Hazardous waste operations and emergency response.

• Appendix: A , B , C , D , E

1910.120(a) Scope, application, and definitions. --
1910.120(a)(l) Scope. This section covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards:
1910.120(a)(l)(i) Clean-up operations required by a governmental body, whether Federal, state local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);
1910.120(a)(l)(ii) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq);..
1910.120(a)(l)(iii)1910.120(a)(l)(iii) Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;
1910.120(a)(l)(iv) Operations involving hazardous waste that are conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and
1910.120(a)(l)(v) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.
1910.120(a)(2) Application.

1910.120(a)(2)(i) All requirements of Part 1910 and Part 1926 of Title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this section or not. Ifthere is a conflict or overlap, the provision more protective of employee safety and health shall apply without regard to 29 CFR 1910.5(c)(l).
1910.120(a)(2)(ii) Hazardous substance clean-up operations within the scope of paragraphs (a)(1)(i) through (a)(1)(iii) of this section must comply with all paragraphs of this section except paragraphs (p) and (q).
1910.120(a)(2)(iii) Operations within the scope of paragraph (a)(l)(iv) of this section must comply only with the requirements of paragraph (p) of this section.

Notes and Exceptions:l 910.120(a)(2)(iii)(A) All provisions of paragraph (p) of this section cover any treatment, storage or disposal (TSD) operation regulated by 40 CFR parts 264 and 265 or by state law authorized under RCRA, and required to have a permit or interim status from EPA pursuant to 40 CFR 270.1 or from a state agency pursuant to RCRA.
1910.120(a)(2)(iii)(B) Employers who are not required to have a permit or interim status because they are conditionally exempt small quantity generators under 40 CFR 261.5 or are generators who qualify under 40 CFR 262.34 for exemptions from regulation under 40 CFR parts 264, 265 and 270 ("excepted employers") are not covered by paragraphs (p)(l) through (p)(7) of this section. Excepted employers who are required by the EPA or state agency to have their employees engage in emergency response or who direct their employees to engage in emergency response are covered by paragraph (p)(8) of this section, and cannot be exempted by (p)(8)(i) of this section...
1910.120(a)(2)(iii)c Ifan area is used primarily for treatment, storage or disposal, any emergency response operations in that area shall comply with paragraph (p)(8) of this section. In other areas not used primarily for treatment, storage, or disposal, any emergency response operations shall comply with paragraph (q) of this section. Compliance with the requirements of paragraph (q) of this section shall be deemed to be in compliance with the requirements of paragraph (p)(8) of this section.
1910.120(a)(2)(iv) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances which are not covered by paragraphs (a)(l)(i) through (a)(l)(iv) of this section must only comply with the requirements of paragraph (q) of this section.
1910.120(a)(3) Definitions -- Buddy system means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group.

The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency. Clean-up operation means an operation where hazardous substances are removed, contained, incinerated, neutralized,d stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment. Decontamination means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects. Emergency response or responding to emergencies means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses. Facility means (A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any water-borne vessel. Hazardous materials response (HAZMAT) team means an organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department. Hazardous substance means any substance designated or listed under (A) through (D) of this definition, exposure to which results or may result in adverse effects on the health or safety of employees: [A] Any substance defined under section 101(14) of CERCLA; [B] Any biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunc-

tions (including malfunctions in reproduction) or physical deformations in such persons or their offspring. [C] Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and [D] Hazardous waste as herein defined. Hazardous waste means -- [A] A waste or combination of wastes as defined in 40 CFR 261.3, or [B] Those substances defined as hazardous wastes in 49 CFR 171.8. Hazardous waste operation means any operation conducted within the scope of this standard. Hazardous waste site or Site means any facility or location within the scope of this standard at which hazardous waste operations take place. Health hazard means a chemical, mixture of chemicals or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Appendix A to 29 CFR 1910.1200. IDLH or Immediately dangerous to life or health means an atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would interfere with an individual's ability to escape from a dangerous atmosphere. Oxygen deficiency means that concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen. Permissible exposure limit means the exposure, inhalation or dermal permissible exposure limit specified in 29 CFR Part 1910, Subparts G and Z. Published exposure level means the exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1986, which is incorporated by reference as specified in § 1910.6, or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1987-88" dated 1987, which is incorporated by reference as specified in § 1910.6. Post emergency response means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. Ifpost emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation,

then the separate group of employees would be considered to be performing post-emergency response and subject to paragraph (q)(11) of this section. Qualified person means a person with specific training, knowledge and experience in the area for which the person has the responsibility and the authority to control. Site safety and health supervisor (or official) means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements. Small quantity generator means a generator of hazardous wastes who in any calendar month generates no more than 1,000 kilograms (2,205) pounds of hazardous waste in that month. Uncontrolled hazardous waste site means an area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands such as those created by former municipal, county or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous substance wastes. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.1910.120(b) Safety and health program.

NOTE TO (b): Safety and health programs developed and implemented to meet other federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this paragraph. An additional or separate safety and health program is not required by this paragraph.

1910.120(b)(1) General.

1910.120(b)(1)(i) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.

1910.120(b)(l)(ii) The written safety and health program shall incorporate the following:

1910.120(b)(1)(ii)(A) An organizational structure;

1910.120(b)(1)(ii)(B) A comprehensive workplan; ..

1910.120(b)(l)(ii)(C)1910.120(b)(l)(ii)(C) A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in paragraph (b)(1)(ii)(F) of this section;

1910.120(b)(l)(ii)(D) The safety and health training program;
1910.120(b)(l)(ii)(E) The medical surveillance program;
1910.120(b)(l)(ii)(F) The employer's standard operating procedures for safety and health; and
1910.120(b)(l)(ii)(G) Any necessary interface between general program and site specific activities.
1910.120(b)(1)(iii) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with Subpart P of 29 CFR Part 1926.1910.120(b)(l)(iv) Contractors and sub-contractors. An employer who retains contractor or sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety or other hazards of the hazardous waste operation that have been identified by the employer's information program.
1910.120(b)(l)(v) Program availability. The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to OSHA personnel, and to personnel of other Federal, state, or local agencies with regulatory authority over the site.
1910.120(b)(2) Organizational structure part of the site program. --
1910.120(b)(2)(i) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include, at a minimum, the following elements:
1910.120(b)(2)(i)(A) A general supervisor who has the responsibility and authority to direct all hazardous waste operations.
1910.120(b)(2)(i)(B) A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.
1910.120(b)(2)(i)(C) All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.
1910.120(b)(2)(i)(D) The lines of authority, responsibility, and communication.
1910.120(b)(2)(ii) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations...
1910.120(b)(3) Comprehensive workplan part of the site program. The comprehensive workplan part of the program shall address the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives.
1910.120(b)(3)(i) The comprehensive workplan shall address anticipated clean-up

activities as well as normal operating procedures which need not repeat the employer's procedures available elsewhere.
1910.120(b)(3)(ii) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.
1910.120(b)(3)(iii) The comprehensive workplan shall establish personnel requirements for implementing the plan.
1910.120(b)(3)(iv) The comprehensive workplan shall provide for the implementation of the training required in paragraph (e) of this section.
1910.120(b)(3)(v) The comprehensive workplan shall provide for the implementation of the required informational programs required in paragraph (i) of this section.
1910.120(b)(3)(vi) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in paragraph (f) if this section.
1910.120(b)(4) Site-specific safety and health plan part of the program. --
1910.120(b)(4)(i) General. The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.
1910.120(b)(4)(ii) Elements. The site safety and health plan, as a minimum, shall address the following:
1910.120(b)(4)(ii)(A) A safety and health risk or hazard analysis for each site task and operation found in the workplan.
1910.120(b)(4)(ii)(B) Employee training assignments to assure compliance with paragraph (e) of this section.
1910.120(b)(4)(ii)(C) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in paragraph (g)(5) of this section.
1910.120(b)(4)(ii)(D) Medical surveillance requirements in accordance with the program in paragraph (f) of this section.
1910.120(b)(4)(ii)(E) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used ...
1910.120(b)(4)(ii)(F) Site control measures in accordance with the site control program required in paragraph (d) of this section.
1910.120(b)(4)(ii)(G) Decontamination procedures in accordance with paragraph (k) of this section.
1910.120(b)(4)(ii)(H) An emergency response plan meeting the requirements of paragraph (1) of this section for safe and effective responses to emergencies, in-

eluding the necessary PPE and other equipment.
1910.120(b)(4)(ii)(I) Confined space entry procedures.
1910.120(b)(4)(ii)(J) A spill containment program meeting the requirements of paragraph G) of this section.
1910.120(b)(4)(iii) Pre-entry briefing. The site specific safety and health plan shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in paragraph (c) of this section shall be used to prepare and update the site safety and health plan.
1910.120(b)(4)(iv) Effectiveness of site safety and health plan. Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.
1910.120(c) Site characterization and analysis --
1910.120(c)(l) General. Hazardous waste sites shall be evaluated in accordance with this paragraph to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.
1910.120(c)(2) Preliminary evaluation. A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person in order to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person in order to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.
1910.120(c)(3) Hazard identification. All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.
1910.120(c)(4) Required information. The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

1910.120(c)(4)(i) Location and approximate size of the site.
1910.120(c)(4)(ii) Description of the response activity and/or the job task to be performed.
1910.120(c)(4)(iii) Duration of the planned employee activity.
1910.120(c)(4)(iv) Site topography and accessibility by air and roads.
1910.120(c)(4)(v) Safety and health hazards expected at the site.
1910.120(c)(4)(vi) Pathways for hazardous substance dispersion.
1910.120(c)(4)(vii) Present status and capabilities of emergency response teams that would provide assistance to on-site employees at the time of an emergency.
1910.120(c)(4)(viii) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties ...
1910.120(c)(5) Personal protective equipment. Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:
1910.120(c)(5)(i) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. lfthere is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment.1910.120(c)(5)(ii) lfpositive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees during initial site entry.
1910.120(c)(5)(iii) lfthe preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site an ensemble providing equivalent to Level B PPE shall be provided as minimum protection, and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See Appendix B for guidelines on Level B protective equipment.)
1910.120(c)(5)(iv) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section.
1910.120(c)(6) Monitoring. The following monitoring shall be conducted during initial site entry when the site evaluation produces information which shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient reasonably to eliminate these possible conditions:

1910.120(c)(6)(i) Monitoring with direct reading instruments for hazardous levels of ionizing radiation. I
910.120(c)(6)(ii) Monitoring the air with appropriate direct reading test equipment for (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances.)
1910.120(c)(6)(iii) Visually observing for signs of actual or potential IDLH or other dangerous conditions.
1910.120(c)(6)(iv) An ongoing air monitoring program in accordance with paragraph (h) of this section shall be implemented after site characterization has determined the site is safe for the start-up of operations.
1910.120(c)(7) Risk identification. Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by the Hazard Communication Standard, 29 CFR 1910.1200, training required by that standard need not be duplicated.
NOTE TO PARAGRAPH (c)(7). - Risks to consider include, but are not limited to: [a] Exposures exceeding the permissible exposure limits and published exposure levels.[b] IDLH Concentrations. [c] Potential Skin Absorption and Irritation Sources.[d] Potential Eye Irritation Sources.[e] Explosion Sensitivity and Flammability Ranges. [f] Oxygen deficiency.
1910.120(c)(8) Employee notification. Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to the affected employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard for this purpose.
1910.120(d) Site control. --
1910.120(d)(l) General. Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begms ..
1910.120(d)(2)1910.120(d)(2) Site control program. A site control program for protecting employees which is part of the employer's site safety and health program required in paragraph (b) of this section shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.
1910.120(d)(3) Elements of the site control program. The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy

system"; site communications including alerting means for emergencies; the standard operating procedures or safe work practices; and, identification of the nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

1910.120(e) Training. --

1910.120(e)(1) General.

1910.120(e)(1)(i) All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph.

1910.120(e)(1)(ii) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

1910.120(e)(2) Elements to be covered. The training shall thoroughly cover the following:

1910.120(e)(2)(i) Names of personnel and alternates responsible for site safety and health;

1910.120(e)(2)(ii) Safety, health and other hazards present on the site;

1910.120(e)(2)(iii) Use of personal protective equipment;

1910.120(e)(2)(iv) Work practices by which the employee can minimize risks from hazards;

1910.120(e)(2)(v) Safe use of engineering controls and equipment on the site;

1910.120(e)(2)(vi) Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards; and

1910.120(e)(2)(vii) The contents of paragraphs (G) through (J) of the site safety and health plan set forth in paragraph (b)(4)(ii) of this section...

1910.120(e)(3)) Initial training.

1910.120(e)(3)(i) General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.

1910.120(e)(3)(ii) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure

limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

1910.120(e)(3)(iii) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

1910.120(e)(3)(iv) Workers with 24 hours of training who are covered by paragraphs (e)(3)(ii) and (e)(3)(iii) of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph (e)(3)(i).

1910.120(e)(4) Management and supervisor training. On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs (e)(3)(ii) and (e)(3)(iii)) and at least eight additional hours of specialized training at the time of job assignment 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.

1910.120(e)(5) Qualifications for trainers. Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

1910.120(e)(6) Training certification. Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1) through (e)(4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of paragraph (e)(9) of this section shall be prohibited from engaging in hazardous waste operations.

1910.120(e)(7) Emergency response. Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

1910.120(e)(8) Refresher training. Employees specified in paragraph (e)(l) of this section, and managers and supervisors specified in paragraph (e)(4) of this section, shall receive eight hours of refresher training annually on the items specified in paragraph (e)(2) and/or (e)(4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

1910.120(e)(9) Equivalent training. Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(l) through (e)(4) of this section shall not be required to provide the initial training requirements of those paragraphs to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site experience.

1910.120(±) Medical surveillance --

1910.120(±)(1) General. Employees engaged in operations specified in paragraphs (a)(l)(i) through (a)(l)(iv) of this section and not covered by (a)(2)(iii) exceptions and employers of employees specified in paragraph (q)(9) shall institute a medical surveillance program in accordance with this paragraph.

1910.120(±)(2) Employees covered. The medical surveillance program shall be instituted by the employer for the following employees:

1910.120(f)(2)(i) All employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;

1910.120(f)(2)(ii) All employees who wear a respirator for 30 days or more a year or as required by
1910.134;1910.120(f)(2)(iii) All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

1910.120(f)(2)(iv) Members of HAZMAT teams.

1910.120(±)(3) Frequency of medical examinations and consultations. Medical examinations and consultations shall be made available by the employer to each employee covered under paragraph (f)(2) of this section on the following schedules:
1910.120(f)(3)(i) For employees covered under paragraphs (f)(2)(i), (f)(2)(ii), and (f)(2)(iv);
1910.120(f)(3)(i)(A) Prior to assignment;
1910.120(f)(3)(i)(B) At least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate; ..
1910.120(f)(3)(i)(C) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.
1910.120(f)(3)(i)(D) As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits or published exposure levels in an emergency situation;
1910.120(f)(3)(i)(E) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.
1910.120(f)(3)(ii) For employees covered under paragraph (f)(2)(iii) and for all employees including of employers covered by paragraph (a)(1)(iv) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary personal protective equipment being used:
1910.120(f)(3)(ii)(A) As soon as possible following the emergency incident or development of signs or symptoms;
1910.120(f)(3)(ii)(B) At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.
1910.120(f)(4) Content of medical examinations and consultations.
1910.120(f)(4)(i) Medical examinations required by paragraph (f)(3) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.
1910.120(f)(4)(ii) The content of medical examinations or consultations made available to employees pursuant to paragraph (f) shall be determined by the at-

tending physician. The guidelines in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (See Appendix D, reference # 10) should be consulted.
1910.120(f)(5) Examination by a physician and costs. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.
1910.120(f)(6) Information provided to the physician. The employer shall provide one copy of this standard and its appendices to the attending physician and in addition the following for each employee:
1910.120(f)(6)(i) A description of the employee's duties as they relate to the employee's exposures,
1910.120(f)(6)(ii) The employee's exposure levels or anticipated exposure levels.
1910.120(f)(6)(iii) A description of any personal protective equipment used or to be used.
1910.120(f)(6)(iv) Information from previous medical examinations of the employee which is not readily available to the examining physician.
1910.120(f)(6)(v)
Information required by §1910.134.1910.120(f)(7) Physician's written opinion.
1910.120(f)(7)(i) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:
1910.120(f)(7)(i)(A) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use...
1910.120(f)(7)(i)(B)1910.120(f)(7)(i)(B) The physician's recommended limitations upon the employees assigned work.
1910.120(f)(7)(i)(C) The results of the medical examination and tests if requested by the employee.
1910.120(f)(7)(i)(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.
1910.120(f)(7)(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposure.
1910.120(f)(8) Recordkeeping.
1910.120(f)(8)(i) An accurate record of the medical surveillance required by paragraph (f) of this section shall be retained.
This record shall be retained for the period specified and meet the criteria of 29

CFR 1910.20.1910.120(f)(8)(ii) The record required in paragraph (f)(8)(i) of this section shall include at least the following information:
1910.120(f)(8)(ii)(A) The name and social security number of the employee;
1910.120(f)(8)(ii)(B) Physicians' written opinions, recommended limitations and results of examinations and tests;
1910.120(f)(8)(ii)(C) Any employee medical complaints related to exposure to hazardous substances;
1910.120(f)(8)(ii)(D) A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.191O.l20(g) Engineering controls, work practices, and personal protective equipment for employee protection. Engineering controls, work practices and PPE for substances regulated in Subpart Z. (i) Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with this paragraph to protect employees from exposure to hazardous substances and safety and health hazards.
1910.120(g)(l) Engineering controls, work practices and PPE for substances regulated in Subparts G and Z.
1910.120(g)(l)(i) Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated by 29 CFR Part 1910, to the extent required by Subpart Z, except to the extent that such controls and practices are not feasible.
NOTE TO PARAGRAPH (g)(l)(i): Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all non-essential employees from potential exposure during opening of drums, wetting down dusty operations and locating employees upwind of possible hazards.
1910.120(g)(l)(ii) Whenever engineering controls and work practices are not feasible, or not required, any reasonable combination of engineering controls, work practices and PPE shall be used to reduce and maintain to or below the permissible exposure limits or dose limits for substances regulated by 29 CFR Part 1910, Subpart Z.
1910.120(g)(l)(iii) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.
1910.120(g)(l)(iv) The provisions of 29 CFR, subpart G, shall be followed.
1910.120(g)(2) Engineering controls, work practices, and PPE for substances not regulated in Subparts G and Z. An appropriate combination of engineering con-

trols, work practices, and personal protective equipment shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by 29 CFR Part 1910, Subparts G and Z. The employer may use the published literature and MSDS as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure limit.

1910.120(g)(3) Personal protective equipment selection.

1910.120(g)(3)(i) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis...

1910.120(g)(3)(ii) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

1910.120(g)(3)(iii) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

1910.120(g)(3)(iv) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

1910.120(g)(3)(v) The level of protection provided by PPE selection shall be increased when additional informationor site conditions show that increased protection is necessary to reduce employee exposures below permissible exposure limits and published exposure levels for hazardous substances and health hazards. (See Appendix B for guidance on selecting PPE ensembles.)

NOTE TO PARAGRAPH (g)(3): The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.

1910.120(g)(3)(vi) Personal protective equipment shall be selected and used to meet the requirements of 29 CFR Part 1910, Subpart I, and additional requirements specified in this section.

1910.120(g)(4) Totally-encapsulating chemical protective suits.

1910.120(g)(4)(i) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

1910.120(g)(4)(ii) Totally-encapsulating suits shall be capable of maintaining

positive air pressure. (See Appendix A for a test method which may be used to evaluate this requirement.)
1910.120(g)(4)(iii) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See Appendix A for a test method which may be used to evaluate this requirement.)
1910.120(g)(5) Personal protective equipment (PPE) program. A personal protective equipment program, which is part of the employer's safety and health program required in paragraph (b) of this section or required in paragraph (p)(1) of this section and which is also a part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element
1910.120(g)(5)(i) PPE selection based upon site hazards,
1910.120(g)(5)(ii) PPE use and limitations of the equipment, ..
1910.120(g)(5)(iii)1910.120(g)(5)(iii) Work mission duration,
1910.120(g)(5)(iv) PPE maintenance and storage,
1910.120(g)(5)(v) PPE decontamination and disposal,
1910.120(g)(5)(vi) PPE training and proper fitting,
1910.120(g)(5)(vii) PPE donning and doffing procedures,
1910.120(g)(5)(viii) PPE inspection procedures prior to, during, and after use,
1910.120(g)(5)(ix) Evaluation of the effectiveness of the PPE program, and
1910.120(g)(5)(x) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.1910.120(h) Monitoring. --
1910.120(h)(1) General.
1910.120(h)(l)(i) Monitoring shall be performed in accordance with this paragraph where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.
1910.120(h)(l)(ii) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.
1910.120(h)(2) Initial entry. Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits or other dangerous condition such as the presence of flammable atmos-

pheres, oxygen-deficient environments.
1910.120(h)(3) Periodic monitoring. Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:
1910.120(h)(3)(i) When work begins on a different portion of the site.
1910.120(h)(3)(ii) When contaminants other than those previously identified are being handled ...
1910.120(h)(3)(iii)) When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)
1910.120(h)(3)(iv) When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)
1910.120(h)(4) Monitoring of high-risk employees. After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water or containers are moved or disturbed; the employer shall monitor those employees likely to have the highest exposures to those hazardous substances and health hazards likely to be present above permissible exposure limits or published exposure levels by using personal sampling frequently enough to characterize employee exposures. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated in the first sentence of this paragraph. Ifthe employees likely to have the highest exposure are over permissible exposure limits or published exposure limits, then monitoring shall continue to determine all employees likely to be above those limits. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated above. NOTE TO PARAGRAPH (h): It is not required to monitor employees engaged in site characterization operations covered by paragraph (c) of this section.
1910.120(i) Informational programs. Employers shall develop and implement a program which is part of the employer's safety and health program required in paragraph (b) of this section to inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors and subcontractors working outside of the operations part of a site are not covered by this standard.
1910.1200) Handling drums and containers --
1910.1200)(1) General.

1910.120Q)(l)(i) Hazardous substances and contaminated, liquids and other residues shall be handled, transported, labeled, and disposed of in accordance with this paragraph.

1910.120Q)(l)(ii) Drums and containers used during the clean-up shall meet the appropriate DOT, OSHA, and EPA regulations for the wastes that they contain.

1910.120Q)(l)(iii) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

1910.120G)(l)(iv) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

1910.120Q)(l)(v) Site operations shall be organized to minimize the amount of drum or container movement.

1910.120Q)(l)(vi) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

1910.120Q)(l)(vii) U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

1910.120Q)(l)(viii) Where major spills may occur, a spill containment program, which is part of the employer's safety and health program required in paragraph (b) of this section, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

1910.120Q)(l)(ix) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

1910.120Q)(l)(x) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.

1910.120Q)(l)(xi) Soil or covering material shall be removed with caution to prevent drum or container rupture.

1910.120Q)(l)(xii) Fire extinguishing equipment meeting the requirements of 29 CFR Part 1910, Subpart L, shall be on hand and ready for use to control incipient fires.

1910.120Q)(2) Opening drums and containers. The following procedures shall be followed in areas where drums or containers are being opened:

1910.120G)(2)(i) Where an airline respirator system is used, connections to the source of air supply shall be protected from contamination and the entire system shall be protected from physical damage.

1910.120G)(2)(ii) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

1910.120G)(2)(iii) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

1910.120G)(2)(iv) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier...

1910.120G)(2)(v) When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

1910.120G)(2)(vi) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

1910.120G)(2)(vii) Employees shall not stand upon or work from drums or containers.

1910.120G)(3) Material handling equipment. Material handling equipment used to transfer drums and containers shall be selected, positioned and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

1910.l20G)(4) Radioactive wastes. Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

1910.1200)(5) Shock sensitive wastes. As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

1910.120G)(5)(i) All non-essential employees shall be evacuated from the area of transfer.

1910.120(j)(5)(ii) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

1910.120G)(5)(iii) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

1910.120G)(5)(iv) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and both the site safety and health supervisor and the command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.
1910.120G)(5)(v) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.
1910.120G)(5)(vi) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized. Caution: Shipping of shock sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Employers and their shippers should refer to 49 CFR 173.21 and 173.50.1910.120G)(6) Laboratory waste packs. In addition to the requirements of paragraph G)(5) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):
1910.120G)(6)(i) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes.1910.120 G)(6)(ii) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.
1910.120G)(7) Sampling of drum and container contents. Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.
1910.120G)(8) Shipping and transport.
1910.120G)(8)(i) Drums and containers shall be identified and classified prior to packaging for shipment.
191O.l20G)(8)(ii) Drum or container staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport.
1910.120G)(8)(iii) Staging areas shall be provided with adequate access and egress routes.
1910.120G)(8)(iv) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.
1910.1200)(9) Tank and vault procedures.
1910.120G)(9)(i) Tanks and vaults containing hazardous substances shall be han-

dled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.
1910.120G)(9)(ii) Appropriate tank or vault entry procedures as described in the employer's safety and health plan shall be followed whenever employees must enter a tank or vault.
1910.120(k) Decontamination --
1910.120(k)(l) General. Procedures for all phases of decontamination shall be developed and implemented in accordance with this paragraph ...
1910.120(k)(2) Decontamination procedures.
1910.120(k)(2)(i) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.
1910.120(k)(2)(ii) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.
1910.120(k)(2)(iii) All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.
1910.120(k)(2)(iv) Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.
1910.120(k)(3) Location. Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.
1910.120(k)(4) Equipment and solvents. All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.
1910.120(k)(5) Personal protective clothing and equipment.
1910.120(k)(5)(i) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.
1910.120(k)(5)(ii) Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.
1910.120(k)(6) Unauthorized employees. Unauthorized employees shall not remove protective clothing or equipment from change rooms.
1910.120(k)(7) Commercial laundries or cleaning establishments. Commercial laundries or cleaning establishments that decontaminate protective clothing or

equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.
1910.120(k)(8) Showers and change rooms. Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of 29 CFR 1910.141. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.1910.120(1) Emergency response by employees at uncontrolled hazardous waste sites --
1910.120(1)(1) Emergency response plan.
1910.120(1)(1)(i) An emergency response plan shall be developed and implemented by all employers within the scope of paragraphs (a)(l)(i) through (ii) of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, OSHA personnel and other governmental agencies with relevant responsibilities.
1910.120(1)(1)(ii) Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan complying with 29 CFR 1910.38.1910.120(1)(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following:
1910.120(1)(2)(i) Pre-emergency planning.
1910.120(1)(2)(ii) Personnel roles, lines of authority, training, and communication.
1910.120(1)(2)(iii) Emergency recognition and prevention.
1910.120(1)(2)(iv) Safe distances and places of refuge.
1910.120(1)(2)(v) Site security and control.
1910.120(1)(2)(vi) Evacuation routes and procedures ...
1910.120(1)(2)(vii) Decontamination procedures which are not covered by the site safety and health plan.
1910.120(1)(2)(viii) Emergency medical treatment and first aid.
1910.120(l)(2)(ix) Emergency alerting and response procedures.
1910.120(l)(2)(x) Critique of response and follow-up.
1910.120(1)(2)(xi) PPE and emergency equipment.
1910.120(1)(3) Procedures for handling emergency incidents.
1910.120(1)(3)(i) In addition to the elements for the emergency response plan required in paragraph (1)(2) of this section, the following elements shall be included for emergency response plans:
1910.120(1)(3)(i)(A) Site topography, layout, and prevailing weather conditions.

1910.120(l)(3)(i)(B) Procedures for reporting incidents to local, state, and federal governmental agencies.
1910.120(l)(3)(ii) The emergency response plan shall be a separate section of the Site Safety and Health Plan.
1910.120(1)(3)(iii) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.
1910.120(1)(3)(iv) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.
1910.120(l)(3)(v) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.
1910.120(l)(3)(vi) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.
1910.120(1)(3)(vii) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.
1910.120(m) Illumination. Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in the following Table H-120.1 while any work is in progress:

TABLE H-120.1. -- MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLESFoot-candles Area or operations
5 General site areas.
3 Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5 Indoors: warehouses, corridors, hallways, and exitways.
5 Tunnels, shafts, and general underground work areas; (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.
10 General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.
30 First aid stations, infirmaries, and offices.
1910.120(n) Sanitation at temporary workplaces --1910.120(n)(l) Potable water.

1910.120(n)(l)(i) An adequate supply of potable water shall be provided on the site.
1910.120(n)(l)(ii) Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.
1910.120(n)(1)(iii) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.
1910.120(n)(1)(iv) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.
1910.120(n)(2) Nonpotable water.
1910.120(n)(2)(i) Outlets for nonpotable water, such as water for firefighting purposes shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.
1910.120(n)(2)(ii) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water...
1910.120(n)(3)1910.120(n)(3) Toilet facilities.
1910.120(n)(3)(i) Toilets shall be provided for employees according to Table H-120.2.

TABLE H-120.2. -- TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and 1 urinal per 40 employees.
More than 200	One toilet seat and 1 urinal per 50 employees.

1910.120(n)(3)(ii) Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.
1910.120(n)(3)(iii) Hazardous waste sites, not provided with a sanitary sewer, shall be provided with the following toilet facilities unless prohibited by local codes:
1910.120(n)(3)(iii)(A) Chemical toilets;
1910.120(n)(3)(iii)(B) Recirculating toilets;
1910.120(n)(3)(iii)(C) Combustion toilets; or
1910.120(n)(3)(iii)(D) Flush toilets.
1910.120(n)(3)(iv) The requirements of this paragraph for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.
1910.120(n)(3)(v) Doors entering toilet facilities shall be provided with entrance

locks controlled from inside the facility...
1910.120(n)(4)1910.120(n)(4) Food handling. All food service facilities and operations for employees shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.191O.l 20(n)(5) Temporary sleeping quarters. When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.
1910.120(n)(6) Washing facilities. The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite; in areas where exposures are below permissible exposure limits and which are under the controls of the employer; and shall be so equipped as to enable employees to remove hazardous substances from themselves.1910.120(n)(7) Showers and change rooms. When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.
1910.120(n)(7)(i) Showers shall be provided and shall meet the requirements of 29 CFR 1910.141(d)(3).
1910.120(n)(7)(ii) Change rooms shall be provided and shall meet the requirements of 29 CFR 1910.141(e). Change rooms shall consist of two separate change areas separated by the shower area required in paragraph (n)(7)(i) of this section. One change area, with an exit leading off the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.
1910.120(n)(7)(iii) Showers and change rooms shall be located in areas where exposures are below the permissible exposure limits and published exposure levels. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the permissible exposure limits and published exposure levels.
1910.120(n)(7)(iv) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.
1910.120(o) New technology programs.
1910.120(0)(1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.
1910.120(0)(2) New technologies, equipment or control measures available to the

industry, such as the use of foams, absorbents, absorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by employers or their representatives. Such an evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort. Such evaluations shall be made available to OSHA upon request.

1910.120(p) Certain Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA). Employers conducting operations at treatment, storage and disposal (TSD) facilities specified in paragraph (a)(1)(iv) of this section shall provide and implement the programs specified in this paragraph. See the "Notes and Exceptions" to paragraph (a)(2)(iii) of this section for employers not covered.1910.120(p)(1) Safety and health program. The employer shall develop and implement a written safety and health program for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives and OSHA personnel. The program shall be designed to identify, evaluate and control safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of paragraph (p)(8) of this section and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies.

1910.120(p)(2) Hazard communication program. The employer shall implement a hazard communication program meeting the requirements of 29 CFR 1910.1200 as part of the employer's safety and program.

NOTE TO §1910.120 - The exemption for hazardous waste provided in 1910.1200 is applicable to this section...

1910.120(p)(3)1910.120(p)(3) Medical surveillance program. The employer shall develop and implement a medical surveillance program meeting the requirements of paragraph (f) of this section.

1910.120(p)(4) Decontamination program. The employer shall develop and implement a decontamination procedure meeting the requirements of paragraph (k) of this section.

1910.120(p)(5) New technology program. The employer shall develop and implement procedures meeting the requirements of paragraph (o) of this section for introducing new and innovative equipment into the workplace.

1910.120(p)(6) Material handling program. Where employees will be handling drums or containers, the employer shall develop and implement procedures meeting the requirements of paragraphs G)(1)(ii) through (viii) and (xi) of this section,

as well as 0)(3) and 0)(8) of this section prior to starting such work.
1910.120(p)(7) Training program --
1910.120(p)(7)(i) New employees. The employer shall develop and implement a training program which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.
1910.120(p)(7)(ii) Current employees. Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this paragraph, shall be considered as meeting the initial training requirements of this paragraph as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.
1910.120(p)(7)(iii) Trainers. Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.
1910.120(p)(8) Emergency response program --
1910.120(p)(8)(i) Emergency response plan. An emergency response plan shall be developed and implemented by all employers. Such plans need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the U.S. Environmental Protection Agency, provided that the contingency plan is made part of the emergency response plan. The emergency response plan shall be a written portion of the employer's safety and health program required in paragraph (p)(1) of this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of paragraph (p)(8) if they provide an emergency action plan complying with
29 CFR 1910.38.1910.120(p)(8)(ii) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this paragraph:

1910.120(p)(8)(ii)(A) Pre-emergency planning and coordination with outside parties.
1910.120(p)(8)(ii)(B) Personnel roles, lines of authority, training, and communication.
1910.120(p)(8)(ii)(C) Emergency recognition and prevention.
1910.120(p)(8)(ii)(D) Safe distances and places of refuge.
1910.120(p)(8)(ii)(E) Site security and control.
1910.120(p)(8)(ii)(F) Evacuation routes and procedures.
1910.120(p)(8)(ii)(G) Decontamination procedures.
1910.120(p)(8)(ii)(H) Emergency medical treatment and first aid.
191O.l20(p)(8)(ii)(I) Emergency alerting and response procedures...
191O.l20(p)(8)(ii)(J) 191O.l20(p)(8)(ii)(J) Critique of response and follow-up.
1910.120(p)(8)(ii)(K) PPE and emergency equipment.
1910.120(p)(8)(iii) Training.
1910.120(p)(8)(iii)(A) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents. Exception # 1: an employer need not train all employees to the degree specified if the employer divides the work force in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained. Exception #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully-trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully-trained emergency response team for assistance.
1910.120(p)(8)(iii)(B) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize

risks; in the appropriate response to over exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over exposures.

1910.120(p)(8)(iii)(C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragraph (p)(8)(iii) of this section, or shall certify the employee's competency for certification of training shall be recorded and maintained by the employer.

1910.120(p)(8)(iv) Procedures for handling emergency incidents.

1910.120(p)(8)(iv)(A) In addition to the elements for the emergency response plan required in paragraph (p)(8)(ii) of this section, the following elements shall be included for emergency response plans to the extent that they do not repeat any information already contained in the emergency response plan:

1910.120(p)(8)(iv)(A)(1) Site topography, layout, and prevailing weather conditions.

1910.120(p)(8)(iv)(A)(2) Procedures for reporting incidents to local, state, and federal governmental agencies.

1910.120(p)(8)(iv)(B) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

1910.120(p)(8)(iv)(C) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

1910.120(p)(8)(iv)(D) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information ...

1910.120(p)(8)(iv)(E) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication; and to begin emergency procedures.

1910.120(p)(8)(iv)(F) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

1910.120(q) Emergency response program to hazardous substance releases. This paragraph covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in paragraphs (a)(1)(i) through (a)(1)(iv) of this section. Those emergency response organizations who have developed and implemented programs equivalent to this paragraph for handling releases of hazardous substances pursuant to section 303 of the Superfund Amendments and Reauthoriza-

tion Act of 1986 (Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11003) shall be deemed to have met the requirements of this paragraph.

1910.120(q)(l) Emergency response plan. An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives and OSHA personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan in accordance with 29 CFR 1910.38.1910.120(q)(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this paragraph:

1910.120(q)(2)(i) Pre-emergency planning and coordination with outside parties..

1910.120(q)(2)(ii) Personnel roles, lines of authority, training, and communication.

1910.120(q)(2)(iii) Emergency recognition and prevention.

1910.120(q)(2)(iv) Safe distances and places of refuge.

1910.120(q)(2)(v) Site security and control.

1910.120(q)(2)(vi) Evacuation routes and procedures.

1910.120(q)(2)(vii) Decontamination.

1910.120(q)(2)(viii) Emergency medical treatment and first aid.

1910.120(q)(2)(ix) Emergency alerting and response procedures...

1910.120(q)(2)(x) Critique of response and follow-up.

1910.120(q)(2)(xi) PPE and emergency equipment.

1910.120(q)(2)(xii) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan to avoid duplication. Those items of the emergency response plan that are being properly addressed by the SARA Title III plans may be substituted into their emergency plan or otherwise kept together for the employer and employee's use.

1910.120(q)(3) Procedures for handling emergency response.

1910.120(q)(3)(i) The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer. NOTE TO PARAGRAPH (q)(3)(i). -

The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e. , battalion chief, fire chief, state law enforcement official, site coordinator, etc.) the position is passed up the line of authority which has been previously established.

1910.120(q)(3)(ii) The individual in charge of the res shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies ...

1910.120(q)(3)(iii) Based on the hazardous substances and/or conditions present, the individual in charge of the res shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in 29 eFR 1910.156(e) when worn while performing fire fighting operations beyond the incipient stage for any incident.

1910.120(q)(3)(iv) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, until such time that the individual in charge of the res determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

1910.120(q)(3)(v) The individual in charge of the res shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

1910.120(q)(3)(vi) Back-up personnel shall be standing by with equipment ready to provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also be standing by with medical equipment and transportation capability.

1910.120(q)(3)(vii) The individual in charge of the res shall designate a safety officer, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

1910.120(q)(3)(viii) When activities are judged by the safety officer to be an IDLH and/or to involve an imminent danger condition, the safety officer shall

have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene.

1910.120(q)(3)(ix) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

1910.120(q)(3)(x) When deemed necessary for meeting the tasks at hand, approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet U.S. Department of Transportation and National Institute for Occupational Safety and Health criteria.

1910.120(q)(4) Skilled support personnel. Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this paragraph for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

1910.120(q)(5) Specialist employees. Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

1910.120(q)(6) Training. Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following paragraphs:

1910.120(q)(6)(i) First responder awareness level. First responders at the aware-

ness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:..
1910.120(q)(6)(i)(A) An understanding of what hazardous substances are, and the risks associated with them in an incident.
1910.120(q)(6)(i)(B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
1910.120(q)(6)(i)(C) The ability to recognize the presence of hazardous substances in an emergency.
1910.120(q)(6)(i)(D) The ability to identify the hazardous substances, if possible.
1910.120(q)(6)(i)(E) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
1910.120(q)(6)(i)(F) The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.
1910.120(q)(6)(ii) First responder operations level. First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:
1910.120(q)(6)(ii)(A) Knowledge of the basic hazard and risk assessment techmques.
1910.120(q)(6)(ii)(B) Know how to select and use proper personal protective equipment provided to the first responder operational level.
1910.120(q)(6)(ii)(C) An understanding of basic hazardous materials terms.
1910.120(q)(6)(ii)(D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
1910.120(q)(6)(ii)(E) Know how to implement basic decontamination procedures.
1910.120(q)(6)(ii)(F) An understanding of the relevant standard operating proce-

<lures and termination procedures ...
1910.120(q)(6)(iii) Hazardous materials technician. Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:
1910.120(q)(6)(iii)(A) Know how to implement the employer's emergency response plan.
1910.120(q)(6)(iii)(B) Know the classification, identification and verification of known and unknown materials by using field survey instruments and equipment.
1910.120(q)(6)(iii)(C) Be able to function within an assigned role in the Incident Command System.
1910.120(q)(6)(iii)(D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.
1910.120(q)(6)(iii)(E) Understand hazard and risk assessment techniques.
1910.120(q)(6)(iii)(F) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.
1910.120(q)(6)(iii)(G) Understand and implement decontamination procedures.
1910.120(q)(6)(iii)(H) Understand termination procedures.
1910.120(q)(6)(iii)(I) Understand basic chemical and toxicological terminology and behavior.
1910.120(q)(6)(iv) Hazardous materials specialist. Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:
1910.120(q)(6)(iv)(A) Know how to implement the local emergency response plan.
1910.120(q)(6)(iv)(B) Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.

1910.120(q)(6)(iv)(C) Know the state emergency response plan.
1910.120(q)(6)(iv)(D) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.
1910.120(q)(6)(iv)(E) Understand in-depth hazard and risk techniques.
1910.120(q)(6)(iv)(F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.
1910.120(q)(6)(iv)(G) Be able to determine and implement decontamination procedures.
1910.120(q)(6)(iv)(H) Have the ability to develop a site safety and control plan.
1910.120(q)(6)(iv)(I) Understand chemical, radiological and toxicological terminology and behavior.
1910.120(q)(6)(v) On scene incident commander. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:
1910.120(q)(6)(v)(A) Know and be able to implement the employer's incident command system.
1910.120(q)(6)(v)(B) Know how to implement the employer's emergency response plan.
1910.120(q)(6)(v)(C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.
1910.120(q)(6)(v)(D) Know how to implement the local emergency response plan ...
1910.120(q)(6)(v)(E) Know of the state emergency response plan and of the Federal Regional Response Team.
1910.120(q)(6)(v)(F) Know and understand the importance of decontamination procedures.
1910.120(q)(7) Trainers. Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.
1910.120(q)(8) Refresher training.
1910.120(q)(8)(i) Those employees who are trained in accordance with paragraph (q)(6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in

those areas at least yearly.

1910.120(q)(8)(ii) A statement shall be made of the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

1910.120(q)(9) Medical surveillance and consultation.

1910.120(q)(9)(i) Members of an organized and designated HAZMAT team and hazardous materials specialist shall receive a baseline physical examination and be provided with medical surveillance as required in paragraph (f) of this section.

1910.120(q)(9)(ii) Any emergency response employees who exhibit signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency incident either immediately or subsequently, shall be provided with medical consultation as required in paragraph (f)(3)(ii) of this section.

1910.120(q)(10) Chemical protective clothing. Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of paragraphs (g)(3) through (5) of this section.

1910.120(q)(ll) Post-emergency response operations. Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

1910.120(q)(ll)(i) Meet all the requirements of paragraphs (b) through (o) of this section; or..

1910.120(q)(ll)(ii) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: 29 CFR 1910.38, 1910.134, 1910.1200, and other appropriate safety and health training made necessary by the tasks they are expected to perform such as personal protective equipment and decontamination procedures.

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WE GUESS BERG WANTED TO MAKE THIS "BOOK" AS THICK AS POSSIBLE.

WHY ELSE WOULD HE LEAVE THE LAST 32 PAGES OF THIS "TEXTBOOK" BLANK?