Saskatchewan
Corrections and
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Commentary

Title: Clandestine Drug Operations
Methamphetamine Laboratories and Marijuana Growing Operations

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Scope
The information in this document will help fire fighters recognize and understand the significant health and life safety risks associated with fire and rescue operations at clandestine drug operations. Recommendations for fireground procedures and suggestions for developing or updating Standard Operating Procedures (SOP's)[1] are also addressed. This document is presented in three parts; methamphetamine laboratories, marijuana growing operations and appendix. The appendices contain recommended practices, a listing of common chemicals used at methamphetamine labs and suggestions for developing SOP's.

The procedures and guides included with this document come from information provided by fire departments that have dealt with clandestine drug operations, experts on the health and life safety threats posed by drug labs and from police agencies. This is the companion document to the Technical Commentary "*Responding to Fires at Clandestine Methamphetamine Drug Laboratories*" available on the OFC web site at www.cps.gov.sk.ca/Safety/fire. Follow the links to the Technical Services page.

[1] In this document the initials SOP are use to identify any set of standard operating procedures, standard operating guidelines (SOG) or similar fire department procedural document.

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Clandestine Methamphetamine Drug Laboratories

Introduction

Methamphetamine is a powerfully addictive drug that is easily produced using readily available chemicals and over-the-counter medications. Labs may be set up in virtually any location. The hazardous materials used in the production of this drug can injure or kill. They also present serious long-term health risks. About 20% of clandestine labs are discovered when they catch fire or explode. Statistics also show more than half of the people injured at clandestine lab fires are emergency responders.

Knowing the Risks

Commonly known as "meth," "crystal meth," "ice" or "crank" (among other terms) methamphetamine is a stimulant similar to amphetamine, but with a longer lasting "high." It is usually made from the pseudo-ephedrine found in some over-the-counter cold medications. It can be produced from a number of readily available chemicals and ingredients. The process (known as "a cook" or "cooking") is extremely hazardous, both in terms of health effects and due to the potential for fire and explosion. As well as impairing judgment the drug increases aggressive tendencies and produces feelings of paranoia in habitual users. Many meth users start operating clandestine labs, not only to make a profit from selling the drug, but also to make enough meth to satisfy their own addiction. It costs about $500 to set up a lab. After that only about three hundred-dollar's worth of raw materials are required to produce 100 grams of pure meth. One "cook" of methamphetamine can be sold on the street for more than $1,500. The drug is sold in tablets, in a crystalline form (crystal meth) or as a powder. Close to 90% of first-time users develop an addiction to the drug.

Criminals running clandestine labs usually try to hide or disguise the operation. They often take measures, sometimes extreme, to protect the lab and the drugs produced there. These illegal facilities are found in both urban and rural locations. Labs are often located in homes or apartments where family members and neighbours are exposed the hazardous materials inherent in the drug cooking process. Some producers use hotel rooms, unoccupied buildings in rural areas, storage buildings, even the trunk of a car. Meth labs are easy to set up. Complex equipment, special skills or a detailed knowledge of chemistry aren't needed. Most of the materials required can be purchased at local hardware stores and pharmacies. The recipes used to manufacture methamphetamine change over time. Recipes are passed from person to person, found in anarchist publications, or on the Internet. The exact hazards present at any particular methamphetamine lab can vary greatly. However, most labs contain flammable and combustible materials, corrosives, solvents, refined drugs, and toxins.

Key Concerns

Clandestine labs are dangerous. They present increased fire and explosion risks. The risks to health and life safety are even more serious. Many common fire fighting strategies and practices don't apply to fires at meth labs. Fire fighters need to educate themselves in several key areas.

- Health and life safety hazards.
- Ensuring public safety.
- Identifying clandestine methamphetamine laboratories.
- Recognizing booby-traps or other defensive measures.
- Structural alterations to buildings.
- Unexpected fire behavior and increased risk of explosion.
- Special fire fighting practices.
- Recommended fireground procedures.

Health Hazards

Clandestine lab operators don't understand - or don't care - about the health dangers of the chemicals they use and create. Many of the precursor[2] chemicals used are dangerous in and of themselves. When combined in the meth cooking process even more hazardous gasses and chemicals are produced. These hazardous substances contaminate everything at a meth lab. Many of the chemicals have extremely short STEL[3] (Short-Term Exposure Limit) values, even at very low concentrations. Most also have listed IDLH (Immediately Dangerous to Life and Health) values, again at very low concentrations. People, furnishings, the structure – anything at all exposed to the lab or cooking process – must be considered contaminated. Anyone or anything that comes into contact with the lab, its contents or occupants must also be considered "hot." A complete decontamination protocol must be followed.[4] Clandestine lab locations are often abandoned after they have been used. These locations remain just as hazardous as a working lab. While normal fire fighter personal protective equipment used with SCBA does give a degree of protection from the dangers at a meth lab, exposure should be kept as brief as possible. After exposure, treat all clothing, SCBA's, tools and equipment as hazardous materials. They should be isolated, even after decontamination on the fireground, until expert advice is sought to determine how – or even if – the gear can be safely returned to service.

[2] Precursor chemicals refer to the ingredients that go into the making of methamphetamine. Many are poisonous, toxic, caustic, explosive or flammable. See the list of precursor chemicals in Appendix F on page 19.

[3] STEL (Short Term Exposure Limit) and IDLH (Immediately Dangerous to Life and health) are measures of how dangerous a particular chemical or substance can be to health and life safety. For example, phosphine gas (an unintentional product of a meth cook gone wrong) has a STEL of 15 minutes at a concentration of just 1 part-per-million (ppm). The IDLH value is just 50 ppm. In practice exposure to phosphine gas is extremely dangerous to health and the gas can be lethal.

[4] Fire Departments must have the equipment, knowledge and established procedures to safely decontaminate fire fighters, other emergency responders or members of the public who have been exposed to a clandestine lab. Departments that don't have decontamination procedures and equipment should establish agreements with near-by Departments that do have decontamination capabilities.

Fire fighting gloves, SCBA straps and some tools may have to be discarded as hazardous materials because they can not be safely decontaminated.

Public Safety

Clandestine drug labs present a significant life safety hazard, not only to emergency responders but also to the public. The smoke and combustion products from a fire at a drug lab must be considered hazardous materials. The public has to be protected from exposure. The best way to do that is establishing a broad exclusion zone. A distance of 300 meters (1,000ft) downwind and 100 meters (330ft) on all other exposures is recommended. People inside that perimeter should be moved to safety, well outside the exclusion zone. Anyone who has been exposed to smoke from the fire building must be considered "hot" and will require complete decontamination. So will emergency responders who have assisted in the evacuation from down-wind areas. Any structures, equipment, livestock or vehicles in the down-wind zone will also require decontamination. During the initial emergency response people who have been exposed to combustion products of the fire should be isolated in a separate safe area. So should the residents of the house or apartment building where the fire has occurred. Even when the number of people exposed to the clandestine lab as residents (or those exposed as a result of a fire) is small, immediate expert assistance should be contacted. Local police or 911 dispatchers can put incident commanders in touch with the provincial *Integrated Drug Unit*. The *Unit* is on 24-hour call to assist with incidents involving meth labs anywhere in Saskatchewan.

Identifying Clandestine Methamphetamine Labs

A "cook" of methamphetamine can take just 1-3 hours, or as long as three days. A number of indicators can alert emergency responders to the presence of a lab.

- ***Unusual odors like ether, solvents, acids, iodine or a strong smell of dried cat urine.*** Clandestine lab operators often seal up windows, doors and vents so the distinctive odors of a "cook" won't escape. This can increase the concentration of hazardous chemicals and substances in the area where the lab is operating. Many labs are discovered when neighbours complain about unusual or offensive odors.

- ***Unusually large quantities of packaging from over-the-counter cold medications, matchbook covers, road flares, discarded cat litter, coffee filters with a reddish residue, containers for common chemicals like drain cleaner or cans of camping fuel.***
  There are literally hundreds of recipes for making methamphetamine. One common ingredient to all recipes is a source of ephedrine, such as the pseudoephedrine found in cold medications like Sudafed® or Contact C®. Ephedrine is the active ingredient in meth. Hundreds of individual tablets are needed for a "cook." As a result, large numbers of the blister-pacs the medication comes in are thrown away. Some recipes call for red phosphorous. Producers get it from road flares or by scraping it off

matchbooks. Large numbers of flares or hundreds of matchbooks are needed to get enough of the chemical. These are often thrown in the trash as well. Coffee filters stained red and cat litter stained a yellow-brownish colour may also be found. Other recipes use lithium. 9-volt lithium batteries are cut apart. The casings are also thrown out in large numbers.

- ***Propane bottles and fire extinguishers.***
  Some recipes for meth use anhydrous ammonia[5]. Lab operators steal the chemical from storage sites using propane bottles or fire extinguishers. The caustic chemical eats away at valve assemblies. Valves turn a bluish colour when exposed to anhydrous ammonia and, since most of the damage is done to the inside of valves, they can fail suddenly. Not only is the gas toxic, bottles can become projectiles from a rapid release of pressure.

- ***Laboratory glassware.***
  Some established drug produces use the sort of glassware found in high school chemistry labs. Beakers, flasks, cooling towers and similar equipment may be used. Glass baking dishes may also be found. Be careful, the absence of laboratory glassware **does not** mean that a meth lab is not in operation. In many labs ordinary containers, like mason jars, plastic jugs and pop bottles are used for the cooking process.

- ***Heating elements, hot plates, Bunsen burners, camp stoves or heating mantels.***
  Some methamphetamine recipes call for chemicals to be heated. Often the chemicals, and the vapours they give off when heated, pose both health and fire risks.

- ***Collections of household chemical containers.***
  A large number of household chemical containers found in unusual locations or with unrelated chemicals may indicate a meth lab operation. For example, cans of camping fuel found with bottles of lye or drain cleaner should alert responders to look for other indicators of a clandestine lab.

- ***Plastic or rubber tubing.***
  In many cases chemical solutions are heated (by external sources like a hot plate or by self-heating chemical reactions) to produce vapours as part of the "cook." Tubing is used to pass the vapour from one container to another.

[5] 1005 is the identification number for anhydrous ammonia in the North American Emergency Response Guidebook (known as the ERGO). The ERGO response guide number for this chemical is 125.

- ***Excessive quantities of hazardous waste.***
  Over time meth users often become "pack-rats" and are hesitant to dispose of anything. One of the effects of prolonged methamphetamine use is feelings of paranoia. Users become deeply suspicious of everyone. They have been known to hoard not only the used materials produced by cooking meth but other drug paraphernalia, like used syringes, as well. For every kilogram of methamphetamine produced 11 to13 kilograms of hazardous waste is produced. Mounds of household garbage have also been found in the homes of lab operators. These behaviors only add to the hazards of clandestine labs. Emergency responders loose significant indicators and warning signs when operators stop discarding waste materials outside and start keeping everything inside.

There may be legitimate reasons for finding some of the indicators listed here at any home, farm or business. But other indicators, like large quantities of medication packaging or distinctive odors, should be enough to alert responders to the potential presence of a clandestine meth lab.

Booby-Traps and Defensive Measures
Large sums of cash and quantities of drugs ready for sale can be found in clandestine methamphetamine labs. Operators often protect their labs with stringent security measures, booby-traps and weapons. The devices and methods used range from very simple to extremely complex and sophisticated. Fire fighters need to know how to recognize these defensive measures and how to protect themselves.

- ***Bars, locks and reinforced doors.***
  Bars over windows and steel entry doors with a number of deadbolt locks are just two of the passive approaches operators use to protect their labs. The presence of these security devices, particularly in neighbourhoods where they are not common, should alert responders to look for other indicators of a clandestine lab. Windows are often painted over or covered with tin foil to keep people from seeing inside. These measures make size-up and forcible entry more difficult.

- ***Entrapment devices.***
  Holes cut in floors, piano wire strung to injure or entangle responders and punji traps[6] have all been found at clandestine labs. Fire fighters should look out for entrapment devices when they observe other indicators, like excessive security measures, unusual items in the trash or distinctive odors.

[6] Punji traps are camouflaged pits filled with sharp stakes or spikes. They are intended to impale the foot of a person stepping on the trap. Approved fire fighting boots will protect the wearer against injury, but a fire fighter may still become trapped when their boot sticks on the spikes. Punji traps are often set up at entry doors, camouflaged by a rug or welcome mat.

- ***Firearms.***
  Some clandestine lab operators have guns for "protection." There are reports of lab operators threatening fire fighters with firearms, even shooting at them. Operators carrying handguns may stay in fire buildings, long after it is safe to remain, in order to "rescue" their drugs or stashes of cash. In some cases rifles or shotguns are rigged at entrances with a trip wire. When the wire is tripped the weapon goes off, killing or injuring anyone in the field of fire.

- ***Explosives, chemical and flammable liquid traps.***
  Designed to kill or injure the person who sets them off, explosive booby-traps are difficult to identify and extremely hazardous. Chemical traps often use acid solutions. Flammable liquid traps are designed to douse a person before the liquid is ignited. Almost anything can be rigged to trigger a booby-trap. Flipping a light switch, opening doors or windows, looking in a refrigerator, checking drawers or moving furniture may trigger an explosive device or lethal chemical trap. Trip wires made from fishing line may be strung across doorways, hallways, or rooms to activate a boob-trap. It is imperative that **nothing** is moved, shut off, turned on, or touched, at a laboratory. Fire fighters should **never** attempt to disarm any of these potentially deadly devices. Fire crews should withdraw immediately, establish a broad exclusion zone around the structure and notify police of the discovery. Evacuating nearby buildings may be necessary.

- ***Animals.***
  Many lab operators keep attack dogs. The animals are usually extremely aggressive and fire fighters have occasionally been forced to injure or kill dogs to protect themselves. More exotic animals have also been found protecting clandestine labs. Poisonous snakes, even alligators, have been encountered. Dealing with dangerous animals is best left to animal control experts.

Structural Hazards

Operators of clandestine labs sometimes create hidden spaces or "secret" rooms in a structure. These spaces present all the same hazards any hidden space creates during a fire – with the added risks of flammable, explosive and potentially toxic materials. Hidden spaces are created under floors, in crawl spaces, attics and closets. These hidden spaces may also be booby-trapped. Structural integrity can be compromised by construction of the hidden spaces, increasing the risks of a collapse.

Fire and Explosion Risks

Almost all the materials and chemicals used in a meth lab present significant fire or explosion risks. Camping fuel, chemicals like ether and excessive amounts of ordinary combustibles are

just a few examples of the materials that make clandestine drug labs a substantial hazard. The operators of drug labs are notorious for poor housekeeping habits. Almost 20% of clandestine methamphetamine labs are discovered when they catch fire or explode. As fires grow the drug-related flammable and combustible materials ignite, unexpectedly intensifying fire conditions. Fire fighters can usually expect a range of familiar conditions at a typical structure fire. But fires at meth labs can quickly (even explosively) escalate; producing conditions more usually associated with fires at high-hazard industrial occupancies. A complete size-up - *keeping in mind the indicators of a potential meth lab* - before committing crews to an aggressive fire attack is essential.

Specialized Fire Fighting Procedures

As dangerous as the health and fire hazards at an operating or abandoned meth lab are, the risks of stopping the chemical reactions underway during a cook can be even greater. Among those risks is the production of toxic phosphine gas or highly corrosive liquids and vapours. While normal fire fighting procedures call for shutting off gas lines and disconnecting electricity – these measures **must** be avoided.

- **Never** turn anything 'on' or 'off' at a suspected meth lab**.**
- **Never** disconnect or interrupt utilities, including domestic water supplies.
- **Do not** touch or move anything in or around the lab site**.**

Minimum amounts of water should be used on the burning lab building or site. A free-burning fire will consume and/or neutralize some of the hazardous materials. Also, the runoff from fire fighting water becomes a hazardous material itself. Water directed into a smoke column could cool it, dropping the smoke to ground level, increasing exposure risks. Normal ventilation practices should be avoided as well. They put fire fighters at unnecessary risk and contaminate equipment. Careful thought has to be given to protecting exposures; particularly those located down-wind of the fire building. Health and life safety concerns **must** come first, even if it means sacrificing exposed buildings. **Do not** overhaul after the fire, the site and debris are hazardous materials.

Decision Flowchart

The OFC has developed a Decision Flowchart to help incident commanders manage fireground operations at clandestine drug laboratories. The flowchart details the recommended actions to be taken in an easy-to-follow "Yes – No" format. Departments can modify the flowchart to conform to their existing SOP's and include the flowchart as part of any new procedures they develop. (See ***Appendix D*** on page 17)

Clandestine Marijuana Grow Operations

Introduction
Marijuana grow operations (known as "grow ops") have fewer of the extreme fire and life safety risks found at methamphetamine drug laboratories, but fire fighters still need to recognize the special dangers these operations present. Illegal marijuana growing operations are big business. The RCMP estimates that up to 2400 metric tons of the drug is grown each year in Canada. Growing marijuana outdoors used to be the leading method of production. In the past few years the number of indoor grow ops has increased dramatically. Most are small-scale, confined to a closet, room or basement in homes and apartments. Other operations are on a much larger scale, using warehouses and farm buildings – even masquerading as garden centres. Marijuana is sold in three forms. Leaves and buds are chopped up and dried for use as smoking material. The sticky resin produced by the plant is collected and processed into dried bricks of hashish (known as "hash"). The resin can also be heated and refined to make "hash oil," a black tar-like substance.

Knowing the Risks
While dried, refined and processed marijuana poses few immediate health risks to fire fighters the facilities used to produce the drug can be hazardous. Many indoor grow operations use hydroponics systems. The high intensity lamps, circulation pumps, non-code wiring and drying facilities present both electrical and combustible materials hazards. In locations where hash oil is processed there will be the added risk of quantities of isopropyl or other alcohol. It is used as a solvent in a process that involves heating open bowls of the volatile liquid. Standard structural fire fighting practices and safety procedures – *while keeping in mind the specific risks associated with these operations* - are usually adequate for dealing with fires at suspected grow ops. There are several key concerns.

- Identifying marijuana growing operations.
- Health and life safety hazards.
- Ensuring public safety.

Identifying Marijuana Growing Operations
There are indicators that fire fighters can use to identify a marijuana growing operation. Some of these indicators may be found on the exterior of a structure during size-up. Other indicators will be found after entry.

- ***Unusual or offensive odors.***
  A skunk-like odor, the distinctive smell of rotting cabbage or a sweet vegetative odor can indicate a grow op. Mothballs, chlorine bleach, industrial soap and air fresheners are all used to try and disguise these distinctive odors.

- ***Heavy condensation on windows and doors.***
  Growing marijuana indoors is a very wet process. The humidity inside a growing room is about 65%; three or four times the normal humidity in most homes. Temperatures under the high intensity lights reach 25°C to 30°C. Condensation builds up on windows and around any opening to the outside, like vents and doorways. Some operators install vent fans to exhaust the moisture. These vents are particularly noticeable in cold weather when a continual cloud of condensed water vapour can be seen.

- ***Unusually bright lights.***
  The high intensity lights used to grow marijuana are difficult to disguise. These lights are as bright as the floodlights used in public parks and outdoor arenas. The presence of intense light escaping around window coverings or when a door is opened are substantial indicators of a grow op.

- ***Quantities of isopropyl or other alcohol.***
  Alcohol is used a s solvent in the production of hash oil. The process involves repeatedly soaking the leaves and buds of the marijuana plant in alcohol and squeezing the mixture through a filter – usually coffee filters. The alcohol is heated in open bowls. Heated alcohol left in open containers is extremely volatile and a relatively small amount can quickly fill a space with flammable/explosive vapours.

- ***Electrical equipment.***
  Indoor grow ops use a lot of electricity. High intensity growing lights require heavy-duty wiring. Operators are unlikely to call on qualified electricians to do the necessary work. In many cases operators engage in a practice known as "guerilla wiring." Worried that the large quantities of electricity used in a grow op will attract attention, operators wire into power supply lines before the meter. These illegal connections are usually hidden from view. The risk to fire fighters comes when they have a power meter pulled to cut off electricity to the structure and the guerilla wiring circuits remain energized. The presence of extra electrical junction boxes or heavy-duty wiring not done to Code are all indicators of a grow op. Other indicators are the sound of large ventilation fans running and the buzzing of high intensity lights. Water pumps and trickling water may also be heard. Neighbours may complain of power brownouts. The heavy electrical draw when growing lights are switched on can reduce power to an entire street or neighborhood.

- ***Passive security measures.***
  Marijuana growers try to keep a low profile. They don't want their operations to attract any undue attention. They try diversions like putting children's toys on the

front lawn, even though no children live in the home. Stuffing the mailbox with flyers, leaving radios on 24 hours-a-day and putting up reality signs are some of the other techniques used. Many grow ops are set up in homes or apartments for the sole purpose of producing marijuana. Because no one lives in the homes no garbage gets put out on trash day. Neighbours may notice strange people coming and going at odd times.

Growers may install bars over windows and install stout entry doors with deadbolt locks. The presence of these security devices, particularly in neighbourhoods where they are not common, should alert responders to look for other indicators of a grow op or clandestine drug lab. Windows are often painted over or covered with tin foil to keep people from seeing inside. "No Trespassing" and "Guard Dog on Duty" signs are often posted to keep people away.

- ***Booby-traps and other aggressive security measures.***
  Defensive devices designed to kill or injure intruders are rarely found at marijuana growing operations. However large industrial-type grow ops are usually guarded in one manner or another. Attack dogs or people with weapons are not uncommon at these larger operations. Fire fighters encountering any aggressive resistance from animals or people should withdraw immediately, contact police and begin a defensive fire attack only if safe to do so.

- ***Discarded equipment and supplies***
  Unusual collections of fertilizer containers, pots, electrical wiring, lighting equipment and PVC piping may be left laying around outside a growing operation. The supplies and equipment used at grow ops are also used at legitimate greenhouses and garden plots, but rarely in the same quantities and combinations.

Health and Safety Hazards

Marijuana (cannabis sativa) is a weed that grows naturally across much of North America. Over the years, growers have crossbred different verities of the plant to increase concentrations of the compound THC (delta-9-tetrahydro-cannabinol). THC is responsible for the "high" users experience. Inhaling the concentrated smoke from dried or processed marijuana is the most common way the drug is used. There are some stories, along the lines of urban legends, that emergency responders to fire scenes at marijuana grow ops have become "stoned" from inhaling the resulting smoke. In reality, the heat released as ordinary combustibles burn completely breaks down any TCH that might be present. The smoke produced at these fires has the same health and safety risks found at any structure fire. Full personal protective equipment (PPE) with SCBA will provide more than adequate protection. Fire fighters should avoid handling plants, bricks of hashish or the equipment used to make hash oil during overhaul operations.

Marijuana growing operations use nitrates and other fertilizers. Again, ordinary PPE with SCBA provides acceptable levels of protection when these substances are burning. In a very few instances, growers use anhydrous ammonia[7]. The safety precautions normally taken at anhydrous ammonia emergencies will address the health and life safety concerns associated with this caustic, toxic chemical.

Public Safety

The risks to public safety are no greater at a fire involving a grow op than at any residential or commercial structure fire. Departments should follow their usual SOP's for establishing exclusion zones and maintaining site security. Fire fighters should also note that a fire involving a marijuana growing operation is a crime scene and police must be contacted right away.

Conclusion

The hazards found at most marijuana growing operations are found at any number of other occupancies. However the non-Code electrical wiring, high intensity lights, fertilizers and hydroponics equipment are rarely found together in the same structure. Fire fighters already have the training, knowledge and skills to deal with these risks. When the indicators of a grow op are found, fire fighters should be ready to alter tactics to deal with the unique combination of these various hazards. Overhaul operations should be kept to a minimum until police arrive. A grow op is a crime scene and (unless the are other pressing concerns like protecting exposures) limiting overhaul activities will assist police with their investigations.

[7] 1005 is the identification number for anhydrous ammonia in the North American Emergency Response Guidebook (known as the ERGO). The ERGO response guide number for this chemical is 125.

Appendix A - List of Clandestine Methamphetamine Drug Laboratory Indicators

- Unusual and offensive odors like solvents, ether, acids, iodine or a strong smell of dried cat urine.
- Covered or painted over windows.
- Extensive security measures – bars on windows, steel doors and heavy locks, booby-traps.
- Unusually large quantities of:
  - packaging from over-the-counter cold medication
  - matchbook covers or road flares
  - yellow or brown-stained cat litter
  - coffee filters with a reddish residue
  - cans of camping fuel
- Propane bottles and fire extinguishers with blue-stained valves.
- Laboratory glassware or odd assortments of containers like pop bottles, mason jars or windshield washer fluid jugs hooked together with tubing.
- Heating elements, hot plates, Bunsen burners, camp stoves or heating mantels.
- Unusual collections of lye, drain cleaner or other caustic chemicals.
- Large hoards of trash kept inside the dwelling or structure.
- Information or warnings from police or neighbours.

Appendix B - Recommended Fire Ground Procedures at Methamphetamine Laboratories

These procedures have been developed based on the best practices of fire departments experienced with responding to clandestine labs. They are intended to cover only fire response to suspected drug labs. Departments that assist police and emergency medical services in non-fire situations will need to develop procedures that go beyond those listed here.

Recommended Fireground Procedures

- **Do not** interrupt any utilities to the lab building.
- **Do not** touch or move anything in or around the lab building or site.
- **Do not** apply water to the lab building or site.
- **Do not** overhaul the fire building, vehicle or site.
- When indicators of a clandestine lab are found treat the call as a hazardous materials incident.
- Create an exclusion zone – 300 meters down wind, 100 meters on other exposures - withdraw immediately to a safe location upwind.
- Consider evacuation of the exclusion zone.
- Avoid contact with people and equipment exposed to the lab location.
- Have EMS respond - advise them of the hazardous material risks.
- Have police respond - ask them to contact the *Integrated Drug Unit* for assistance.
- Establish emergency decontamination facilities.
- Decontaminate all responders, residents and members of the public exposed to the lab and smoke from the burning building, vehicle or site.
- Decontaminate all equipment and apparatus that was exposed.
- Ensure any that any person who may have been exposed seeks medical attention.
- Treat runoff water as hazardous material.
- Ensure security at the fire scene – prevent all access until police take over the scene.

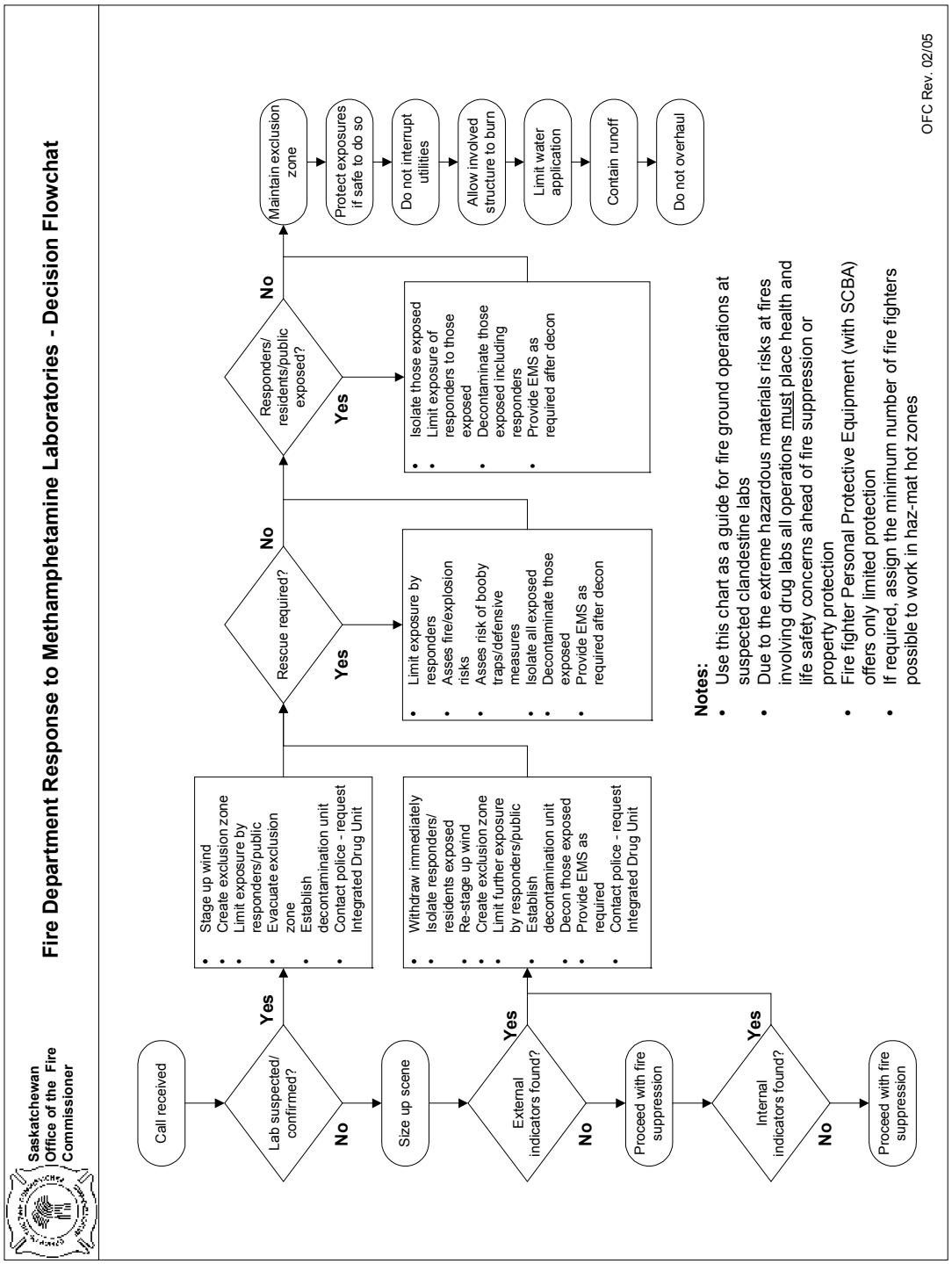
Appendix C - Recommended Emergency Decontamination Procedures

If a department is not trained and equipped for the haz-mat risks at a meth lab incident, there are still actions that can be taken to provide a degree of effective decontamination. It is important to remember that any person or equipment exposed to potential contamination must be isolated until they can be thoroughly decontaminated when the proper information and expert advice is available.

Emergency Decontamination

- Create haz-mat hot and warm zones.
- Isolate personnel and equipment requiring decontamination in a safe area of the haz-mat hot zone.
- When ready, move personnel into the haz-mat warm zone and use water from a hose-line to wash off protective clothing and equipment thoroughly. Contain run off water. Treat run off as hazardous material.
- Have dry sand or other neutral absorbent material available to control any violent chemical reactions with water. Treat used absorbents as hazardous material.
- Remove and isolated protective clothing and equipment – treat as hazardous material.
- After protective clothing and equipment has been removed keep personnel in a safe up-wind area of the haz-mat warn zone.
- Seek expert advice from the provincial *Integrated Drug Unit*. Follow their recommendations for further decontamination.
- Have personnel who have been in the haz-mat hot zone or have been exposed to potential contamination seek medical advice after complete decontamination.

Appendix D - Response to Methamphetamine Drug Laboratories Decision Flowchart



Appendix E - Indicators of Clandestine Marijuana Growing Operations

- Offensive odors like rotting cabbage, a sweet vegetative smell or a skunk-like odor. The smell of bleach, mothballs, industrial cleaners or air fresheners.
- Heavy condensation on windows and around doors or vents.
- Covered or painted over windows.
- Unusually bright light escaping around window coverings or when doors are opened.
- Quantities of isopropyl or other alcohol. Look for glass mixing bowls and baking dishes. Unusual numbers of coffee filters and alcohol containers may also be found.
- Heavy-duty electrical wiring, power surges and brownouts. Electrical panels and wiring not normally found in similar structures. Non-Code wiring.
- Domestic indicators like stacks of uncollected newspapers and mail. Children's toys in yards where no children live. Fake real estate signs. Strangers coming and going at odd hours. No garbage put out on collection days.
- Security measures - bars on windows, stout doors and locks. "No Trespassing" and "Guard Dog on Duty" signs.
- Discarded equipment and supplies:
    - fertilizer containers
    - planting pots
    - electrical wiring
    - heavy-duty lighting fixtures and equipment
    - PVC water piping
- Information or warnings from police or neighbours.

Appendix F - Precursor Chemicals

Precursor chemicals refer to the ingredients that go into the making of methamphetamine. Many are poisonous, caustic, explosive or flammable. There are two main types of methamphetamine production. Some use red phosphorous and iodine in the "cooking" process. This technique is known as the "Red P" method. The other major type of meth production uses a common chemical process known as a "Birch Reduction." This technique is also called the "Nazi" method.

Chemical	Characteristics	Health Risks	Fire Risks
Acetone (dimethyl ketone)	A colorless, flammable liquid with a mildly pungent and somewhat aromatic odor	Vapor is irritating to eyes and nose in high concentrations; inhalation of the vapor may cause dizziness leading to coma; liquid is irritant to eyes and may cause severe damage; ingestion may cause gastric irritation and bleeding leading to coma	Highly volatile flammable and combustible liquid. Vapours readily ignite
Alcohol (isopropyl)	An extremely volatile clear liquid with a characteristic medicinal odor	May be toxic if inhaled or ingested. Will irritate skin and eyes. Vapours may cause dizziness or suffocation	Extremely flammable, may form explosive mixtures with air. Easily ignited by sparks, flame or heat. Vapours may flashback to source. Run off may create fire/explosion hazard
Anhydrous ammonia	A colourless, odorless, extremely corrosive and toxic gas that may be fatal if inhaled. Contact with liquefied gas causes burns and/or frostbite	Attacks mucous membranes (mouth, eyes, nose and lungs) causing sever burns, an inhalation hazard leading to pulmonary edema and asphyxia	May ignite on exposure to air in concentrations of 15 to 20% or greater

Chemical	Characteristics	Health Risks	Fire Risks
Ephedrine (methamphetamine, pseudoephedrine)	In the raw form a white crystalline powder	Harmful if swallowed in large quantities; avoid breathing dust and avoiding contact with skin and eyes	None
Hydriodic Acid (hydrogen iodide)	A corrosive acid which is colourless when freshly prepared; with exposure to light it turns yellow to brown in colour	Vapors are irritating to the respiratory system, skin and eyes; can dissolve flesh, liquid causes severe burns to eyes and skin; if ingested, may cause severe internal irritation and injury	Non-combustible, the substance itself does not burn but will produce corrosive and/or toxic fumes when heated. Contact with some metals may produce flammable hydrogen gas
Hydrochloric Acid (muriatic acid, hydrogen chloride)	A corrosive liquid, colourless or coloured a light yellow from traces of iron, chlorine and organic matter. Produces vapour when heated or when in contact with water, moist materials or tissue. Reaction with water is violent and will generate great heat, increasing vapour production	Toxic. Inhalation, ingestion or vapour contact with the skin or eyes causes severe injury, burns or death. Heating or exposure to fire or to water produces irritating, corrosive and toxic gasses	Non-combustible, the substance itself does not burn but may produce corrosive and/or toxic fumes when heated, exposed to fire or to water. Sealed containers may explode when heated
Hydrogen sulfide	A colourless gas with an offensive stench said to smell like rotten eggs. Sometimes know as “sewer gas.” When combined with water and *iodine* produces *hydrochloric acid*	May be fatal if inhaled or absorbed through skin. Contact with gas or liquefied gas may cause burns or frostbite. Longer-term exposure to lower concentrations can cause eye irritation, headache, and fatigue	Extremely flammable, may form explosive mixtures with air. May be ignited by sparks, flame or heat. Vapours from liquefied gas initially heavier than air. Vapour may flashback to source. Run off may create fire/explosion hazard

Chemical	Characteristics	Health Risks	Fire Risks
Iodine	Bluish-black powder or scales; has a characteristic odor, a sharp acrid taste and produces a violet coloured corrosive vapor when heated or in contact with water. When combined with water and *hydrogen sulfide* produces *hydriodic acid*. Can also be mixed with red phosphorous	Produces vapour when heated. Vapors are irritating to the respiratory system and eyes. In solid form irritates the eyes and may burn the skin. May cause nausea and internal bleeding if ingested. Can cause circulatory collapse	None
Petroleum distillates (naphtha, camping fuel)	An extremely volatile clear liquid with a petroleum naphtha odor	Acute irritation by inhalation. Produces nasal and respiratory irritation, nausea, drowsiness, breathlessness and fatigue. Exposure to higher concentrations can result in central nervous system depression, convulsions, and loss of consciousness. Irritates skin and eyes	Forms flammable mixtures with air, can flash at room temperature. Explosion hazard in fire situations. Vapor heavier than air and may travel considerable distance to a source of ignition and flash back
Phenylacetic acid (used in production of herbicides)	A white powder with a disagreeable pungent odor, usually sold as 50% liquid solution, available in formulations with sodium or potassium	May be toxic by ingestion. Inhalation, or contact (skin and eyes) with solid substance or aqueous solution may cause severe injury, burns or death	Combustible material, may burn but does not ignite readily. Produces acrid smoke and irritating fumes when heated
Phenyl-2-prepanone (methyl benzyl ketone, P-2-P)	A viscous fluid	Toxic by ingestion, irritating to skin and eyes	Combustible material, may burn but does not ignite readily. Fire may produce irritating, caustic and/or toxic gasses

Chemical	Characteristics	Health Risks	Fire Risks
Phosphine (hydrogen phosphide)	A colourless gas (odorless when pure) has a fishy or garlic-like odor with the presence of impurities	Toxic by inhalation. Exposure to lower concentrations results in headache, fatigue, weakness, thirst, chest pain or pressure, shortness of breath. Exposure to higher concentrations can result in convulsions or coma. Formed when iodine and red phosphorous are combined in methamphetamine recipes using the "Red P" method	Toxic vapors are produced when iodine and red phosphorous are combined and the mixture is heated above 180^{o} C. Heating may occur during a fire or if the domestic water supply or electricity are switched off – shutting down the cooling bath or refrigerator being used to cool the chemical reaction
Red phosphorous	A powder, red to violet in colour. Not soluble in organic solvents	Vapour from ignited phosphorous irritates mucous membranes (mouth, eyes, nose and lungs)	Flammable/combustible material which may be ignited by friction, heat, sparks or flames. When burning may flare-up suddenly
Sodium hydroxide (caustic soda, lye)	White powder which comes in flakes, pellets and sticks. Rapidly absorbs water from the air. In strong concentrations produces considerable heat when mixed with water or acids	Toxic by ingestion or inhalation. Concentrated solids, liquid solutions and vapours are very corrosive to human tissue, causing sever burns	Non-combustible. May produce caustic/toxic vapours when heated or exposed to fire.
Sulfuric acid (hydrogen sulfate)	A clear, colourless, odorless, oily liquid	Toxic by inhalation, ingestion or by skin contact. Concentrated acid is extremely corrosive to tissue, causes sever burns. When heated produces toxic/corrosive fumes. Produces heat when mixed with water	Does not support combustion. Reacts with water, sometimes violently, producing corrosive/toxic vapours. Contact with some metals may produce flammable hydrogen gas

Chemical	Characteristics	Health Risks	Fire Risks
Toluene (methylebanzene)	A liquid solvent with a benzene-like odor	May have toxic effects by inhalation or when absorbed through the skin. Heating produces irritating, corrosive and potentially toxic vapours. Has potential to cause damaging long-term health effects	Highly flammable and volatile which may be ignited by heat, sparks or flames. Vapours form explosive mixtures with air. Vapour may flashback to source when ignited

Appendix G - Developing SOP's

Each fire department will want to develop SOP's based on their existing procedures, preparedness to respond to hazardous materials incidents and the nature of existing mutual aid agreements. There is no one "right" way to develop SOP's. But departments experienced in developing effective SOP's usually follow an established set of procedures.

- Develop and/or revise policy for responding to clandestine drug operations.
- Evaluate existing capacity for response to hazardous materials incidents.
- Review existing SOP's.
- Write new SOP's.
- Acquire new equipment required by the SOP's.
- Develop and implement training programs.

Writing new SOP's can seem like a daunting task. Like most aspects of fire fighting, teamwork makes the effort much easier. Form a group to write the new SOP's. Each member can be responsible for developing one part of the new procedures. Then the group can review and edit the results. Finally, all members of the department should have an opportunity to review the new SOP document and make comments.

- **Developing policy**
  Too often this essential step is skipped when writing new SOP's. Decisions must be made about what tasks the department will be, and won't be, expected to perform. Some departments may decide to restrict their efforts to defensive procedures only, regardless of the need for rescue or controlling exposures. Other departments may want to use aggressive procedures for rescue and fire control. It is important that municipal leaders understand and support the policies developed by the fire department. The public has certain expectations of their fire department. These usually include aggressive fire fighting and rescue attempts. The unique hazards presented by clandestine drug operations - and the special fire fighting procedures those hazards mandate - run contrary to public expectations. Experience shows a fire department can expect criticism when the anticipated procedures are not followed, no matter how great the risk to fire fighters and the public. When municipal leaders understand the risks and the reasons for special fire fighting tactics they will be ready to support the department and answer any pubic concerns or complaints. Including a member of Council in the development and review of the fire department policy for responding to clandestine drug operations has two benefits. Council will be much more likely to endorse the policies that are developed, as well as be ready to address any public concerns that may come up.

- **Evaluating existing capacities**
  A clear and complete evaluation of just what a department can do and what they can't do is essential. Here honesty really is the best policy. For example, the ability to perform effective decontamination of those exposed to a meth lab is an essential task many departments are not equipped to perform. Procedures, equipment and the availability of key personnel must be reviewed and deficiencies identified. There is no room for error when dealing with the health and safety hazards at a clandestine lab. The proper equipment and a sufficient number or trained personnel must be available for every response, not just when answering calls to known drug labs or locations. There is the potential for any fire call to turn into a drug lab response. Departments that plan to rely on mutual aid partners for decontamination need to establish a crystal-clear understanding of what services the mutual aid department will provide. Mutual aid agreements must leave no doubt about when and under what circumstances help will be available. Agreements must be updated to reflect these new procedures.

- **Reviewing existing SOP's**
  A department's current SOP's will contain many of the building blocks for writing a new SOP covering response to a clandestine lab. Although many specialized fire fighting procedures are needed when fighting a fire at drug operations, existing procedures for crewing apparatus, the use of PPE and SCBA and calling for mutual aid response may all be used in the new SOP with little or no change.

- **Writing new SOP's**[8]
  The National Fire Protection Association (NFPA) defines SOP's as "*an organizational directive that establishes a standard course of action*." SOP's look at the "nuts and bolts" of a task, giving clear directions for completing that job. SOP's must be written to meet specific goals, they should be:

  a) Clear and concise - standard operating procedures should be written using short, declarative sentences and easily understood descriptive terms.
  b) Complete - containing all the necessary information to perform the procedure without unnecessary or lengthy explanations or instructions.
  c) Objective - containing facts, not opinions.

[8] Departments with limited experience in developing SOP's will find the task much easier after reviewing SOP writing guides. The *Fire Service Emergency Operating Guidelines for Incident Commanders* developed by the Canadian Association of Fire Chiefs provides numerous models for developing SOP's. The U.S. Federal Emergency Management Agency (FEMA) also has an excellent guide available at their web site: http://www.state.il.us/osfm/SOP_SOG/SOPs.pdf.

d) Coherent - showing a logical thought process and a sequential listing of all steps necessary to complete the procedure.

After the first draft of an SOP is written it should be carefully reviewed. Does the document cover all the points listed above? A good test of an SOP is to have it reviewed by a fire fighter from another department. Assumptions about a department's practices can creep into SOP's because everyone "knows" how something is done. If someone who is not familiar with your department's policies and procedures can clearly understand the document then those assumptions are avoided.

- **Acquire new equipment required by the SOP's**
  When an SOP is developed based on established policy, rather than on existing equipment and procedures, the document provides clear direction about the new or upgraded equipment that will be needed. Knowing just what new apparatus and equipment is required allows a department to organize their budget and spending priorities.

- **Develop and implement training programs**
  This last step is one of the most important. Fire fighters have to understand and practice how to use a new SOP. This is particularly true when mutual aid responses are involved. Developing training materials often has the added benefit of exposing any deficiencies in the new document. The extreme health and life safety hazards of fires involving clandestine drug operations makes effective training even more important.

SOP's are "living documents." They must be regularly reviewed and updated. The effectiveness of any SOP should be assessed after every call where they are used. Flaws in the SOP may be discovered. Using an SOP under fireground conditions may also highlight ways to improve the document.