

**FIELD FUMIGATION EMERGENCY RESPONDER GUIDE:
CHLOROPICRIN**

THIS GUIDE IS FOR VAPOR EXPOSURES TO AIRBORNE EMISSIONS OF CHLOROPICRIN FOLLOWING SOIL INJECTION TO AGRICULTURAL FIELDS. CHLOROPICRIN MAY BE APPLIED ALONE OR IN COMBINATION WITH METHYL BROMIDE, 1,3-DICHLOROPROPENE, IODOMETHANE, OR DIMETHYL DISULFIDE. SEE FIELD POSTING FOR ACTUAL PRODUCT APPLIED. SEE EMERGENCY RESPONDER GUIDE FOR EACH CHEMICAL APPLIED. SEE PESTICIDE LABEL FOR EXPOSURE TO LIQUID OR SPILLS.

POTENTIAL HAZARDS

HEALTH	<p>Chloropicrin behaves as a mild irritant at concentrations between 75 ppb and 150 ppb and is usually detected through odor and eye sensation, within 5 minutes of exposure. At concentrations of about 75 ppb, eye sensation (prickliness or pinching) can be felt in about 20 minutes. Symptoms are temporary and reversible at concentrations up to 150 ppb. At levels above 150 ppb headache, nausea and vomiting may occur. At levels above 580 ppb for 8 hours or 2000 ppb for 10 minutes, life-threatening effects including pulmonary edema or death can occur</p> <p>The OSHA 8-hour TWA is 100 ppb.</p> <p>The NIOSH IDLH is 2000 ppb.</p> <p>Chloropicrin has been shown to not cause cancer in animal studies following long-term inhalation. Laboratory testing showed that at inhalation exposures below levels which produced permanent respiratory injury, birth defects or decrement in reproductive function did not occur. Chloropicrin is not expected to accumulate in human tissue.</p>
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CHEMICAL PROPERTIES	<p>Chloropicrin is injected into the soil as a liquid where it becomes a vapor. Vapors are heavier than air, and will collect in low areas. Chloropicrin is volatile and concentrations may increase under still or low wind conditions. Vapors are not flammable or explosive.</p>
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PUBLIC SAFETY

FIRST AID	<p>Remove exposed persons to fresh air. Treat symptoms. Personal decontamination is not necessary for bystander exposure.</p>
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CONTACT	<p>Contact certified applicator (24 hour telephone number is posted at the field).</p>
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EVACUATION	<p>If the health symptoms of chloropicrin are present downwind of the application field, evacuate all bystanders and workers without respiratory protection in the downwind areas first. Evacuate a minimum of ¼ mile or if the treated field is larger than 10 acres, evacuate ¼ mile for every 10 acres of treated field. Evacuate upwind areas if winds are calm, variable or if atmospheric inversion conditions are present. If evacuation may increase exposures, Shelter In Place in all occupied structures until it is safe to evacuate.</p> <p>In general, Shelter in Place includes the following steps:</p> <ol style="list-style-type: none"> 1. Bring children and pets indoors immediately. If children are at school, do not try to bring them home unless told to. The school will shelter
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	<p>them.</p> <ol style="list-style-type: none"> 2. Turn off the heating, ventilation or air conditioning system. Turn off all fans, including bathroom fans operated by the light switch. 3. Close the fireplace or woodstove damper 4. If instructed to seal the room, use duct tape and plastic sheeting, such as heavy-duty plastic garbage bags, to seal all cracks around the door into the room. Tape plastic over any windows. Tape over any vents and seal electrical outlets and other openings. As much as possible, reduce the flow of air into the room. 5. When told that the emergency is over, open windows and doors, turn on ventilation systems and go outside until the building's air has been exchanged with the now clean outdoor air. Follow any special instructions given by emergency authorities. <p>These recommendations were excerpted from the American Red Cross and Centers For Disease Control and Prevention website for Shelter-in-Place During a Chemical or Radiation Emergency. The website address is: http://www.redcross.org/preparedness/cdc_english/Sheltering.asp#howdo.</p>
DETECTION	Use direct reading colorimetric detection devices such as Kitagawa Toxic Gas Detection Kit using tube No. 8014-172S, Drager kit using tube No. 8103421, or Sensidyne Kit using tube No. 172S. Contact certified applicator for detection devices and tubes.
PPE	Wear loose fitting clothing. For concentrations above 150 ppb, a full face respirator fitted with organic vapor cartridges is required. For concentrations of 2,000 ppb or more, a self-contained breathing apparatus (SCBA) is required.
MITIGATION	
FIELD	Reduce emissions by applying water to all or part of the field via sprinklers, water truck, or flood irrigation. Potassium thiosulfate (KTS) may be added to water at concentrations up to 50% to increase effectiveness of water seal.
STRUCTURES	Ventilate all structures within evacuation area. Prior to allowing occupants to return to structures, no person should experience sensory irritation and air monitoring is required to confirm that chloropicrin concentrations are less than 150 ppb.

Attention: The information set forth above is intended to be a summary of general information only. It is not intended to be a substitute for the emergency response and precautionary instructions provided on a government-approved product label or MSDS. It is the responsibility of persons intending to use this guide to read and follow the label and MSDS, and to comply with all applicable federal, state and local laws and regulations when responding to an emergency.

**FIELD FUMIGATION EMERGENCY RESPONDER GUIDE:
METHYL BROMIDE**

THIS GUIDE IS FOR VAPOR EXPOSURES TO AIRBORNE EMISSIONS OF METHYL BROMIDE FOLLOWING SOIL INJECTION TO AGRICULTURAL FIELDS. METHYL BROMIDE IS APPLIED IN COMBINATION WITH CHLOROPICRIN. SEE FIELD POSTING FOR ACTUAL PRODUCT APPLIED. SEE THE APPLICABLE EMERGENCY RESPONDER GUIDE FOR EACH CHEMICAL APPLIED. SEE PESTICIDE LABEL FOR EXPOSURE TO LIQUID OR SPILLS.

POTENTIAL HAZARDS

HEALTH	<p>While methyl bromide is odorless the formulations registered for soil fumigation contain at least 2% chloropicrin, and typically contain 33% or even higher levels of chloropicrin. Chloropicrin is a mild irritant at low concentrations, and is usually detected through odor and eye sensation within 5 minutes of exposure. When methyl bromide/chloropicrin formulations are applied, detection of chloropicrin is a reliable indication that exposure to methyl bromide has occurred. Symptoms of over exposure to methyl bromide appear slowly and include dizziness, blurred vision, lassitude, staggering gait, slurred speech, nausea, vomiting, lack of appetite and loss of muscle coordination. If over exposure is suspected, individuals should be monitored for 24 hours for the development of symptoms.</p> <p>EPA regulations require the use of self-contained breathing apparatus if methyl bromide air concentration is unknown, or if the concentration is above 5ppm. Cartridge-type respirators are not acceptable.</p> <p>The OSHA PEL for methyl bromide is 20 ppm, as a ceiling concentration.</p> <p>The NIOSH IDLH for methyl bromide is 250 ppm.</p> <p>Methyl bromide has been shown to not cause cancer in animal studies following long-term inhalation. Methyl bromide is not expected to accumulate in human tissue.</p>
CHEMICAL PROPERTIES	<p>Methyl bromide is injected into the soil as a liquid where it becomes a vapor. Methyl bromide is volatile and concentrations may increase under still or low wind conditions. Vapors are not flammable or explosive.</p>

PUBLIC SAFETY

FIRST AID	<p>Remove exposed persons to fresh air. Treat symptoms. Personal decontamination is not necessary for bystander exposure.</p>
CONTACT	<p>Contact certified applicator (24-hour telephone number is posted at the field).</p>
EVACUATION	<p>If the health symptoms of methyl bromide or chloropicrin are present downwind of the application field, evacuate all bystanders and workers without respiratory protection in the downwind areas first. Evacuate a minimum of ¼ mile or if the treated field is larger than 10 acres, evacuate ¼ mile for every 10 acres of treated field. Evacuate upwind areas if winds are calm, variable or if atmospheric inversion conditions are present. If evacuation may increase exposures, Shelter In Place all occupied structures until it is safe to evacuate.</p> <p>In general, "Shelter in Place " in homes includes the following steps:</p> <ol style="list-style-type: none"> 1. Bring children and pets indoors immediately. If children are at school, do not try to bring them home unless told to do so. The school

	<p>will shelter them.</p> <ol style="list-style-type: none"> 2. Turn off the heating, ventilation or air conditioning system. Turn off all fans, including bathroom fans operated by the light switch. 3. Close the fireplace or woodstove damper. 4. If instructed to seal the room, use duct tape and plastic sheeting, such as heavy-duty plastic garbage bags, to seal all cracks around the door into the room. Tape plastic over any windows. Tape over any vents and seal electrical outlets and other openings. As much as possible, reduce the flow of air into the room. 5. When told that the emergency is over, open windows and doors, turn on ventilation systems and go outside until the building's air has been exchanged with the now clean outdoor air. Follow any special instructions given by emergency authorities. <p>These recommendations were excerpted from the American Red Cross and Centers For Disease Control and Prevention website for Shelter-in-Place During a Chemical or Radiation Emergency. The website address is: http://www.redcross.org/preparedness/cdc_english/Sheltering.asp#howdo.</p>
DETECTION	Use direct reading colorimetric detection devices such as Matheson-Kitagawa Toxic Gas Detection Kit using tube No. 8014-157SC or Drager kit using tube No. 8101671. (Contact certified applicator for detection devices and tubes). Photoionization detectors such as the ToxiRae or MiniRae (RAE Systems) can also be used to indicate the presence of methyl bromide, but these devices respond to many organic vapors, so readings may be misleading. The presence of methyl bromide can be confirmed only with a specific sensing device such as a colorimetric tube.
PPE	Wear loose fitting clothing. For concentrations above 5 ppm, a self-contained breathing apparatus is required.
MITIGATION	
FIELD	Reduce emissions by using appropriate tarp materials, ensuring that application equipment is properly calibrated and in good working order, and promptly repairing holes or tears in tarps.
STRUCTURES	If the presence of methyl bromide has been confirmed in the evacuation area, all structures within the area must be ventilated prior to allowing occupation. Air monitoring is required to confirm that methyl bromide concentrations are less than 1 ppm, and no sensory irritation may be experienced for occupants to return to the structures.

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**FIELD FUMIGATION EMERGENCY RESPONDER GUIDE:
METAM SODIUM/METAM POTASSIUM AND MITC**

THIS GUIDE IS FOR VAPOR EXPOSURES TO AIRBORNE EMISSIONS OF METHYL ISOTHIOCYANATE (MITC) FOLLOWING APPLICATION OF METAM SODIUM OR METAM POTASSIUM TO AGRICULTURAL FIELDS. METAM SODIUM OR METAM POTASSIUM MAY BE APPLIED ALONE OR IN COMBINATION WITH 1,3-DICHLOROPROPENE OR CHLOROPICRIN. SEE FIELD POSTING FOR ACTUAL PRODUCT(S) APPLIED. SEE THE APPLICABLE EMERGENCY RESPONDER GUIDE FOR EACH CHEMICAL APPLIED. SEE PESTICIDE LABEL FOR EXPOSURE TO LIQUID OR SPILLS.

POTENTIAL HAZARDS

HEALTH

MITC, the conversion product of metam sodium and metam potassium application, behaves as a mild irritant at concentrations between 0.2 ppm and 0.8 ppm and is usually detected through eye sensation, within 5 minutes of exposure. The odor threshold is 1.7 ppm. At levels above 0.8 ppm, headache, nausea, and vomiting may occur. These symptoms are temporary and reversible following termination of exposure.

US EPA AEGL (proposed and may be updated when final)

	MITC AIR CONCENTRATION (ppm)				
	Exposure Duration				
	10 min	30 min	60 min	4 hr	8 hr
AEGL-1 (Notable discomfort)	0.8	0.8	0.8	0.8	0.8
AEGL-2 (Disabling, irreversible damage)	43	29	23	9.0	4.3
AEGL-3 (Death)	130	88	70	27	13

CHEMICAL PROPERTIES

Metam sodium or metam potassium is injected into the soil in solution where it is converted into the vapor MITC. MITC is volatile and concentrations may increase under still or low wind conditions. MITC vapor is not flammable or explosive.

PUBLIC SAFETY

FIRST AID

Remove exposed persons to fresh air. Treat symptoms. Personal decontamination is not necessary for bystanders with inhalation exposure.

CONTACT

Contact certified applicator (24-hour telephone number is posted at the field).

EVACUATION

If the health symptoms of MITC exposure are present downwind of the application field, evacuate all bystanders and all workers without respiratory protection in downwind areas first. Evacuate a minimum of ¼ mile, or if the treated field is larger than 10 acres, evacuate ¼ mile for every 10 acres of treated field. Evacuate adjacent areas around the field if winds are calm, variable, or if atmospheric inversion conditions are present. If evacuation may increase exposures, Shelter In Place all occupied structures until it is safe to evacuate.

EPA has asked for specific instruction to accompany the “Shelter in Place” recommendation. In general, Shelter in Place includes the following steps:

1. Bring children and pets indoors immediately. If children are at school, do not try to bring them home unless told to. The school will shelter them.
2. Turn off the heating, ventilation or air conditioning system. Turn off all fans, including bathroom fans operated by the light switch.
3. Close the fireplace or woodstove damper.
4. If instructed to seal the room, use duct tape and plastic sheeting, such

	<p>as heavy-duty plastic garbage bags, to seal all cracks around the door into the room. Tape plastic over any windows. Tape over any vents and seal electrical outlets and other openings. As much as possible, reduce the flow of air into the room.</p> <p>5. When told that the emergency is over, open windows and doors, turn on ventilation systems and go outside until the building's air has been exchanged with the now clean outdoor air. Follow any special instructions given by emergency authorities.</p> <p>These recommendations were excerpted from the American Red Cross and Centers For Disease Control and Prevention website for Shelter-in-Place During a Chemical or Radiation Emergency. The website address is: http://www.redcross.org/preparedness/cdc_english/Sheltering.asp#howdo.</p>
DETECTION	Use direct reading colorimetric detection devices for MITC such as a Draeger kit using tube No. 8103485. Contact certified applicator for detection devices and tubes.
PPE	Wear loose fitting clothing. If odor is detected, face-sealing goggles and a respirator fitted with a pre-filter approved for pesticides and an organic vapor cartridge are required unless a full-face respirator with a pre-filter approved for pesticides organic vapor cartridges is worn.
MITIGATION	
FIELD	Reduce emissions by applying water to all or part of the field via sprinklers, water truck, flood irrigation, or other appropriate method.
STRUCTURES	Air monitoring is required to confirm that MITC concentrations are less than 0.2 ppm, and no sensory irritation may be experienced for occupants to return to the structures.

This document is intended as guidance to aid emergency responders. It should be considered as supplemental to information on the product label and MSDS and not as a replacement for that information.