# Appendix C

# Department of Pesticide Regulation Recommended Permit Conditions

**Introduction**

This Appendix contains Department of Pesticide Regulation recommended permit conditions for various restricted material pesticides.

**Topics discussed**

This Appendix contains discussions on the following topics:


| Section / Topic | See page… |
|---|---|
| C.1--General Drift Minimization | C-2 |
| C.2--Rice Pesticides | C-4 |
| C.3--Ground Water Protection Approved Alternative Management Practices | C-27 |
| C.4--Carbofuran (Furadan) | C-28 |
| C.5--Tribufos (DEF, Folex) | C-29 |
| C.6--Commodity Fumigation<br>• 6.1 – Methyl Bromide and Sulfuryl Fluoride<br>• 6.2 – Tarped Potting Soil Fumigation | C-30 |
| C.7--Soil Fumigation<br>• 7.1 – 1,3-Dichloropropene (1,3-D)<br>• 7.2 – Metam-Sodium and Metam-Potassium<br>• 7.3 – Methyl Bromide<br>  • 7.3.1 – Soil Fumigation Within A Greenhouse<br>• 7.4 – Approved Alternatives<br>  • 7.4.1 – Nighttime Applications of Metam-Sodium<br>  • 7.4.2 – Drench Application Method of Metam-Potassium or Metam-Sodium<br>  • 7.4.3 – Metam-Potassium and Metam-Sodium Sprinkler 4:00 a.m. Start Method | C-106 |

# Section C.1

# General Drift Minimization

**Introduction** The following drift minimization measures are recommended permit conditions for those pesticides that are restricted materials, in addition to the drift minimization measures described on the pesticide label. Applicators are encouraged to utilize these measures for other pesticides whenever possible to minimize environmental contamination from drift.

I. AIRCRAFT

A. Aircraft application equipment used to apply a pesticide spray solution shall be configured as follows:
   1. Functional boom length, measured from outboard nozzle to outboard nozzle, shall not exceed 75% of the overall wing span or rotor length.
   2. Boom pressure shall not exceed the manufacturer's recommended pressure for the nozzles being used.
   3. The flow of liquid from each nozzle shall be controlled by a positive shutoff system.
   4. Nozzle orifices shall be directed backward, neutral to the airstream.
   5. Aircraft shall be equipped with:
      (a) Jet nozzles having an orifice of not less than one-sixteenth of an inch in diameter. Nozzles shall not be equipped with any device or mechanism which would cause a sheet, cone, fan, or similar type dispersion of the discharged material, except helicopters operating at 60 miles per hour or less may add a number 46 (or equivalent) or larger whirlplate;
      (b) Helicopters operating at 60 miles per hour or less may, instead of (a), be equipped with fan nozzles with a fan angle number not larger than 80 degrees and a flow rate not less than one gallon per minute at 40 pounds per square inch pressure (or equivalent); or
      (c) After evaluation, the director may authorize other nozzles for aircraft use.

B. Aerial applications of a pesticide spray solution shall meet the following requirements:
   1. Apply only when there is a positive air flow. Wind speed shall not be more than ten miles per hour at the application site, as measured by an anemometer positioned four feet above the ground.
   2. Discharge shall start after entering the target site; discharge height shall not exceed ten feet above the crop or target; discharge shall be shut off whenever necessary to raise the equipment over obstacles; discharge shall be shut off before exiting the target site.

*Continued on next page*

## General Drift Minimization, Continued

II. GROUND

A. Vehicle-mounted or towed ground equipment, other than handguns, used to make applications shall be equipped with:
   1. Nozzles having an orifice not less than one-sixteenth of an inch in diameter (or equivalent) and operated at a boom pressure not to exceed the manufacturer's recommended pressure for the nozzles being used; or
   2. Low-pressure fan nozzles with a fan angle number not larger than 80 degrees and nozzle orifice not less than 0.2 gallon per minute flow rate (or equivalent) and operated at a boom pressure not to exceed 15 pounds per square inch.

B. Applications of a pesticide spray solution made by vehicle-mounted or towed ground equipment shall meet the following requirements:
   1. Apply only when wind speed is ten miles per hour or less at the application site, as measured by an anemometer positioned four feet above the ground.
   2. Discharge shall start after entering the target site; discharge shall be shut off before exiting the target site.

# Section C.2

# Recommended Permit Conditions for Rice Pesticides

**Introduction**

This document provides recommended permit conditions for pesticide applications to rice.

**Attachments**

This Appendix contains the following topics:


| Subsection / Topic | See Page… |
|---|---|
| C.2.1—Instructions to County Agricultural Commissioners on Rice Pesticide Permit Issuance | C-5 |
| C.2.1.1—Data Reporting Guidelines for the Rice Pesticide Program | C-13.1 |
| C.2.2—General Water-Holding | C-14 |
| C.2.3—Methyl Parathion | C-15 |
| C.2.4—Molinate | C-16 |
| C.2.5—Phenoxy/Dicamba Herbicides | C-22 |
| C.2.6—Thiobencarb | C-23 |

# Subsection C.2.1

## Instructions to County Agricultural Commissioners on Rice Pesticide Permit Issuance

**Introduction**

The Department of Pesticide Regulation (DPR), in cooperation with the Central Valley Regional Water Quality Control Board (CVRWQCB), developed recommended permit conditions to meet water quality management objectives for Malathion, Methyl Parathion, Molinate, and Thiobencarb. These conditions reflect management practices required by current Board Resolution. DPR and CVRWQCB believe that use of these permit conditions will meet water quality management objectives for these rice pesticides.

**Approved resolution**

The Central Valley Regional Water Quality Control Board (CVRWQCB) approved resolution is available for review at:
http://www.waterboards.ca.gov/centralvalley/adopted_orders/index.html

### Rice Pesticide Water Monitoring and Annual Reporting

**CRC responsibility**

The rice industry, via the California Rice Commission (CRC), will be responsible for leadership in water monitoring, annual reporting to the CVRWQCB, and coordinating the participation of all program stakeholders.

- The rice industry is ultimately responsible for meeting water quality objectives.
- DPR, as a co-regulator with the water boards, will continue to use its authority to regulate the sales and use of pesticides to address water quality issues involving pesticides. DPR will continue to actively participate with CVRWQCB and the rice industry staff to address rice pesticide issues.

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## Seepage Mitigation Requirements

**Seepage defined**

For purposes of mitigating seepage in rice production:

- Seepage is lateral movement of irrigation water through a rice field levee or border to an area outside the normally flooded production area. Seepage can occur through levees into adjacent dry fields or into adjacent drains and canals.

**Seepage documentation**

DPR requests that county agricultural commissioners (CACs) continue monitoring for seepage when inspecting for water-holding compliance by:

- Checking for seepage, or collection of seepage, that occurs through the outer borders of a field or the bottom border located at the lowest part of the field.
- Using the water-holding inspection logs to document seepage observations. The Pesticide Use Monitoring Inspection Form (PR-ENF-104) may also be used to document seepage observations. Indicate "water-hold inspection" on the blank line under "application inspection."
- Document in the "Remarks" section on either form: Seepage flow less than five gallons per minute, or seepage flow more than five gallons per minute.

**Enforcement action**

Any visible seepage moving offsite during the water-holding period that drains into the waters of the State is considered an early release and is a water-holding violation. An enforcement action should be taken in accordance with 3 CCR section 6128.

**Brochure**

Please continue to distribute the brochure, *Seepage Water Management, Voluntary Guidelines for Good Stewardship in Rice Production,* Publication 21568, to growers at the time of permit issuance.

*Continued on next page*

## Drift Minimization Requirements

**Mitigation measures**

- DPR will provide "focused" oversight inspection of thiobencarb aerial applications to monitor thiobencarb drift mitigation requirements.
- DPR recommends all rice pesticide permits be conditioned with *General Drift Minimization* restrictions.

## Thiobencarb Drift Mitigation Requirements

**Mandatory preseason thiobencarb stewardship training (applies to Sacramento Valley counties only)**

- Restricted material permits for the use of thiobencarb should not be issued to growers who have not received CRC certification that they have attended a Thiobencarb Stewardship Meeting.
- The CAC may certify a grower that did not attend a Thiobencarb Stewardship Meeting by having them view a video of the preseason Thiobencarb Stewardship Meeting.
- DPR will provide "focused" oversight inspection of thiobencarb aerial applications to monitor thiobencarb drift mitigation requirements.

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## General Information

**Malathion water management recommendations**

CVRWQCB has approved a water management practice for malathion applied to rice that will help meet water quality performance goals for malathion in surface water. Malathion is currently not a restricted material and not subject to permit conditions. However, it is important that growers comply with the following water management practice:

- **All water from fields treated with pesticides containing malathion should be retained on the site of application or contained within a tailwater recovery system, or other system, adequate to prevent discharge to waters of the State for at least four days following application.**

**Storm Event Work Group**

The Communication Plan developed by the Storm Event Work Group will be utilized in the event of a severe storm occurrence. The Storm Event Work Group will continue to meet as needed. Currently, the work group is comprised of staff from the Regional Water Board, DPR, University of California, a reclamation district representative, CACs, and the rice industry. The California Rice Commission will take the lead in facilitating this group.

**One-page summaries**

Table A summarizes the PPE required by Ordram® 15-GM, Ordram® 8-E PPE labeling, and DPR's recommended permit conditions for molinate. Table B summarizes the recommended water-holding permit conditions for molinate and thiobencarb. The summaries can be used as quick references. Please refer to the specific permit conditions and pesticide labeling for a complete explanation of the requirements.

| Topic | See Table |
|---|---|
| Summary of Ordram 15-GM and 8-E Labeling Requirements For Personal Protective Equipment (Includes Ordram Permit Condition Requirements) | A |
| Rice Pesticides Water Management Requirements Summary (Water-holding permit conditions for malathion, methyl parathion, molinate, and thiobencarb) | B |

*Continued on next page*

**Emergency release forms**

Form A is used for an emergency release request. Form B is used for reporting the emergency release. These DPR-suggested forms may be reproduced under county letterhead.

| Topic | See Form |
|---|---|
| Rice Pesticides Water Management Requirements, Emergency Release Request Form | Form A |
| Rice Pesticides Water Management Requirements, Emergency Release Report Form | Form B |

*Continued on next page*

# Summary of Ordram 15-GM and 8-E Labeling Requirements For Personal Protective Equipment

## (Includes Ordram Permit Condition Requirements)

| | Ordram 15-GM | | | | | | Ordram 8-E | | |
|---|---|---|---|---|---|---|---|---|---|
| Personal Protective Equipment | Loaders **OR** Any persons having contact w/or handling full, partial or empty bags | Flaggers NOT working in an enclosed cab | Flaggers working in an enclosed Cab | Aerial & Ground Applicator Handlers **NOT** involved in M/L | Ground Applicator **NOT** involved in M/L; **NOT** having contact w/ bags and **NOT** working in an enclosed cab. | Ground Applicator **NOT** involved in M/L; **NOT** having contact w/ bags & working in an enclosed cab | Mixers & Loaders | Ground Applicators **NOT** working in enclosed cab | Ground Applicators **NOT** involved in M/L & working in a enclosed cab |
| Long sleeve shirt & long pants **UNDER** disposable coverall **OR,** Full body cloth charcoal suit **UNDER** cotton coverall or chemical-resistant coverall **OR,** Long sleeve shirt & long pants **UNDER** chemical resistant coverall | ● | ● | ● | | **P** | | ● | **P** | |
| Coverall | | | | ● | ● | ● | | ● | ● |
| Shoes plus socks | | | | ● | ● | ● | ● | ● | ● |
| Respirator (½ mask) | ● | ● | ● | | | **P** | | | **P** |
| Full Face Respirator | **P** (1) | | | | **P** | | **P** | **P** | |
| Protective Eye Wear | | **P** | **P** | | | | | | |
| Chemical-resistant gloves | ● | ● | ● | | **P** | | ● | **P** | |
| Chemical-resistant foot wear | ● | ● | ● | | **P** | | ● | **P** | |
| Tightly woven head covering | **P** | **P** | | | **P** | | **P** | **P** | |
| Chemical-resistant apron | | | | | | | ● (2) | | |
| Pilots involved in loading or equiv. activities shall wear the same PPE as loaders | | | | ● | | | | | |
| Handler PPE may not be reduced or modified as specified in [40CFR 170.240(d)(4-6)] | | | ● | | | ● | | | ● |

(1) When conflict occurs use stricter requirement
(2) If dry disconnects are not used for loading Ordram 8-E, a chemical resistant apron must be worn.
**P**= Required by Ordram Permit Conditions

Table B

# Rice Pesticides Water Management Requirements Summary

| **Water must be held for the indicated number of 24 hour periods on site or containment before release into State waters** | **Ordram 15-GM** | **Ordram 8-E** | **Bolero 15-G** | **Bolero UltraMax** | **Abolish 8EC** | **M. Parathion** | **Malathion** |
|---|---|---|---|---|---|---|---|
| | Hold | Hold | Hold | Hold | Hold | Hold | Hold |
| Single field | 28 | 4 | 30 | 30 | 19 | 24 | 4 (e) |
| Single field Southern area only (a) | | | 19 | 19 | | | |
| Release into tailwater recovery system or pond onto fallow field [Except Southern area (a)] | 28 | 4 | 14 (b) | 14 (c) | 14 (b) | | |
| Multi-growers & district release onto closed recirculating systems | 8 | 4 | 6 | 6 | 6 | | |
| Multi-growers & district release onto closed recirculating systems in the Southern area (a) | | | 6 | 6 | | | |
| Release from closed recirculating system | | | 19 | 19 | 19 | | |
| Release into area that discharge negligible amount into perennial streams | 12 | 4 | 19 | 19 | 6 (d) | | |
| Pre-flood application – Release onto tailwater recovery system etc. | 4 | 4 | | | | | |
| Emergency release of tailwater | 11 | | 19 | 19 | 19 | | |
| Commissioner verifies the hydrologic isolation of the fields | | | 6 | 6 | 6 | | |

a – Sacramento/San Joaquin Valley defined as: South of the line defined by Roads E10 and 116 in Yolo County and the American River in Sacramento County.
b – Thiobencarb permit condition allows Bolero 15G label hold period of 14 days.
c – Thiobencarb permit condition allows Bolero UltraMax label hold period of 14 days.
d – See hydrologic isolated fields.
e – Voluntary hold.

# FORM A

## RICE PESTICIDES WATER MANAGEMENT REQUIREMENTS, Emergency Release Request Form

☐ Molinate ☐ Thiobencarb

Grower:_____Permit No.:_____

Address:_____Zip:_____

Field Location:_____Site No.:_____

Chemical applied:_____ Chemical applied:_____

Rate of application:_____ Rate of application:_____

Date of application:_____ Date of application:_____

Average water depth
at time of application:_____ Average water depth
at time of application:_____

Starting date of emergency release:_____

Acres treated in field:_____ Laser leveled: Yes_____No _____

Type of irrigation system: Flow through_____Recycle_____Static_____Other_____

Date flooding began:_____ No. of days it takes to fill field:_____

Describe problem that led to emergency release:_____

_____

_____

Steps that can be taken to prevent emergency releases from this field in future years:_____

_____

_____

Recommendation by (attached):_____

Applications by:_____

Grower's signature:_____Date:_____

Approved by:_____
Agricultural Biologist

## FORM B

## RICE PESTICIDES WATER MANAGEMENT REQUIREMENTS, Emergency Release Report Form

☐ Molinate ☐ Thiobencarb

Grower:_____ Permit No.:_____

Address:_____ Zip:_____

Field Location:_____ Site No.:_____

Beginning date of release:_____ Ending date:_____

The grower must determine the amount of water discharged during the emergency release period. To do this, measure the width of each weir opened to allow the discharge. Then, on a daily basis, measure the height of water flowing over each weir. Record all information in the table below.

| Weir 1 | | Weir 2 | | Weir 3 | |
|---|---|---|---|---|---|
| Width: | | Width: | | Width: | |
| Date | Height of water | Date | Height of water | Date | Height of water |
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# Subsection C.2.1.1

## Data Reporting Guidelines for the Rice Pesticide Program

**Introduction**

This document outlines the data reporting guidelines for the Rice Pesticide Program.

**Pesticide Use Reporting procedures**

Follow your normal download and submittal practices (i.e., via e-mail) when electronically sending pesticide use report (PUR) data to DPR. Please send your rice PUR data to DPR's **Pest Management and Licensing Branch** in a timely manner so this data can be compiled and summarized for the annual report.

**California Rice Commission report preparation**

The California Rice Commission (CRC) will submit a routine information request[1] to each rice-growing county for inspection data, and compliance and enforcement action data. The CRC will contact DPR to obtain the PUR data.

The CRC will use the data to prepare the annual report required by the Central Valley Regional Water Quality Control Board (CVRWQCB) by December 31 of each year.

**Reporting inspection, compliance, and enforcement action data**

The California Rice Commission will request the following inspection, compliance, and enforcement action data. You may continue to use the *Annual Rice Reporting Information* form that follows.

For **molinate** (Ordram®) and **thiobencarb** (Bolero®, Abolish™), report the number of:

- Mix/load inspections
- Application inspections
- Water hold inspections
- Release inquiries
- Emergency releases
- Water seepage inspections apply only to Sacramento Valley Rice Growing Counties
- Non-compliance inspections
- Agricultural civil penalties (ACPs)

*Continued on next page*

[1] Starting in 2009, the California Rice Commission will obtain this information directly from the rice-growing counties.

**Reporting seepage inspection data**

When conducting molinate and thiobencarb seepage inspections, please characterize the amount of seepage observed during the inspection as: "no seepage," "less than five gallons of seepage," or "more than five gallons of seepage." Use the *Annual Rice Reporting Information* form that follows; enter the number of sites with:

- No seepage
- Less than five gallons of seepage
- More than five gallons of seepage.

**Mail, e-mail, or fax**

Please mail, e-mail, or fax the inspection and compliance/enforcement action data requested above by **September 30** to:

Roberta Firoved
Industry Affairs Manager
California Rice Commission
8801 Folsom Blvd., Suite 172
Sacramento, California 95826-3249
Telephone: (916) 387-2264

e-mail: rfiroved@calrice.org
Fax: (916) 387-2265

**"Completed" Water-holding Enforcement Actions to CVRWQCB**

Additionally, at the request of the CVRWQCB, please send all "completed" water-holding enforcement actions within 30 days after enforcement action is completed to:

Rice Pesticide Program
Central Valley Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, California 95670-6114

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# ANNUAL RICE REPORTING INFORMATION

County: _____ Acres of Rice Planted: _____

| | | INSPECTION TYPES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMICALS | * ACP | APPLICA-TIONS | | MIX / LOAD | | RELEASE INQUIRES | | EMERGENCY RELEASES | | WATER HOLD | | WATER SEEPAGE ** | | | | |
| | | | | | | | | | | | | # of Water Seepage | | # of Sites w/ No Seepage | # of Sites w/ Less Than 5 Gallons | # of Sites w/ More Than 5 Gallons |
| | | # | N/C | # | N/C | # | N/C | # | N/C | # | N/C | # | N/C | | | |
| ORDRAM® 15 G | | | | | | | | | | | | | | | | |
| ORDRAM® 8E | | | | | | | | | | | | | | | | |
| BOLERO® 15G | | | | | | | | | | | | | | | | |
| ABOLISH™ 8EC | | | | | | | | | | | | | | | | |
| Totals | | | | | | | | | | | | | | | | |

Please send the above information to California Rice Commission by e-mail to rfiroved@calrice.org, by fax at (916) 387-2265, or by mail to 8801 Folsom Blvd., Suite 172, Sacramento, California 95826-3249 by **September 30th** of each year.

* Administrative Civil Penalty

** Sacramento Valley Rice counties only

Rev. 111908

# Subsection C.2.2

## General Water-Holding

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I. The following seepage control requirements apply to all rice pesticides having mandatory water-holding requirements such as molinate, thiobencarb, etc. Non-compliance with seepage requirements is considered a water-holding violation.

   A. Rice pesticides, such as molinate and thiobencarb, shall not be applied to rice fields exhibiting visible water seepage that moves offsite into drains that are considered state waters.
   B. Borders surrounding each rice field shall be compacted before water is allowed to fill the field; the degree of compaction shall be sufficient to prevent water from seeping through the border. For example, compaction may be achieved by driving the tires or tracks of a tractor, or other heavy vehicle, on one side of the border.
   C. This requirement applies to new or reworked existing borders for the current rice season.
   D. A common border between two existing rice fields does not need to be compacted.

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# Subsection C.2.3

## Methyl Parathion

| | |
|---|---|
| **Drift mitigation** | No aerial application of liquid formulations of methyl parathion shall be made to rice within 300 feet of any agricultural drain unless there is a continuous positive air flow away from the drain. |
| **Water management** | Water shall not be discharged to waters of the State from sites treated with methyl parathion for at least 24 days following application. |

# Subsection C.2.4

## Molinate

**Water Management**

I. Except as listed below, all water from fields treated with products containing molinate must be retained on the site of application for at least 28 days following application. When drainage begins, discharge must not exceed two inches of water over a drain box weir for seven additional days. Unregulated discharges from these fields may then start after 35 days.

For water contained within a tailwater recovery system, ponded on fallow land, or contained in other systems adequate to prevent discharge, the following applies:

1. If the system is under the control of one permittee, water may be discharged from the application site in a manner consistent with product labeling (four-day water-hold period).
2. If the system includes drainage from more than one permittee, water must be retained on the application site for at least eight days before water may be discharged from the application site into the system.
3. If water is from acreage within the bounds of areas that discharge "negligible amounts" of rice field drainage into perennial streams until fields are drained for harvest, all water on fields treated with molinate must be retained on the treated acreage for 12 days following application.
4. If water is from acreage treated with a preflood application of molinate, the label restrictions apply (four-day water-hold period).

II. Emergency release requirements (Weather-related)

1. The county agricultural commissioner may authorize the emergency release of tailwater after a minimum 11-day water-hold period, following a review of a written request (Form A), which clearly demonstrates the crop is suffering because of the water management requirements.
2. All water management requirements must be followed that are associated with other pesticides that may have been applied to the site. Additionally, the requester must describe preventative action that would avoid the need for future emergency releases.
3. Under an emergency release variance, tailwater may be released only to the extent necessary to mitigate the documented problem.
4. Those issued an emergency release must submit to the county agricultural commissioner a report (Form B) indicating the time and duration of the emergency release and data that can be used to calculate the total volume of water released during the emergency release.
5. Emergency release will only be granted for reasons related to rainfall, high winds, or other extreme weather conditions that cannot be moderated with management practices.

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III. Emergency release requirements (Salinity damage)

1. The county agricultural commissioner may authorize the emergency release of field water after a minimum 11-day water-hold period, following the review of a written application that demonstrates salinity levels are damaging to the crop.
2. Applicants for such emergency releases must provide the following information:
   (a) All information indicated on the emergency release request form (Form A), including a description of the severity and extent of salinity damage.
   (b) Electrical conductivity (EC) measurements, expressed as deciSiemens per meter (dS/m) or microSiemens per centimeter ($\mu$S/cm), from field water in each paddy suspected of having salinity problems. To most effectively demonstrate salinity problems, measurements should be taken wherever salinity problems are evident.
   (c) The instrument (make and model) used to determine EC measurements. The instrument must have a sensitivity range that accommodates the full range of EC values in intake and paddy water (usually a range of 0-5.0 dS/m or 0-5,000 $\mu$S/cm should be sufficient) and should have a resolution of not less than five percent. The instrument must be calibrated according to the manufacturer's instructions. The applicant must specify the method of temperature compensation (i.e., automatic, conversion table).
   (d) Who made the EC measurements.
   (e) The source of irrigation water (e.g., district supply canal, drainage canal, well, etc.).
3. An emergency release may be granted only if all of the following conditions are satisfied:
   (a) All required information is provided.
   (b) Water management requirements for rice pesticides, other than molinate, are satisfied.
   (c) EC of paddy water exceeds 2.0 dS/m or 2,000 $\mu$S/cm.
   (d) The county agricultural commissioner or his/her staff inspects the site.
   (e) Water may be released from paddies where EC measurements exceed 2.0 dS/m or 2,000 $\mu$S/cm and from paddies down gradient from such paddies within the same field. Water shall only be released in an amount necessary to mitigate the salinity problem.
   (f) Those issued an emergency release must submit to the county agricultural commissioner a report (Form B) indicating the time and duration of the emergency release and data that can be used to calculate the total volume of water released during the emergency release.

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**Worker Safety**

The following are the Worker Safety Permit Conditions for Molinate (Ordram®).

I. General Requirements

A. Personal Protective Equipment

1. Coveralls are specifically required by these molinate (Ordram®) permit conditions as:
   (a) Personal protective equipment (PPE) for handling activities in addition to the PPE requirements on the Ordram® 15-GM, and Ordram® 8-E labels.
   (b) These permit conditions specify that references to a long-sleeved shirt and long pants herein, and on the Ordram® 15-GM, and Ordram® 8-E product labels, shall be interpreted to mean garments meeting the definition of coveralls.

2. Protective apparel (coverall or garment) combinations:
   (a) A coverall or garments defined as a "coverall" in 3 CCR section 6000, UNDER a disposable coverall made of a synthetic material capable of excluding particles 45 microns or larger in diameter, such as Tyvek Q®[1], KLEENGUARD®[1], polypropylene, or other brands of coverall material approved by DPR, Worker Health and Safety Branch; **OR**
   (b) A full-body cloth suit (long-sleeved and long-legged) impregnated with activated charcoal UNDER a coverall or garments defined as a "coverall" in 3 CCR section 6000; **OR**
   (c) A coverall or garments defined as a "coverall" in 3 CCR section 6000, UNDER a chemical resistant coverall as specified in 3 CCR section 6738(g)(1). Examples of a chemical resistant coverall are rain suits, Tyvek QC®[1], Tyvek® laminated with SARANEX®[1], polypropylene laminated with polyethylene, or other brands of coverall approved as chemical resistant by the DPR, Worker Health and Safety Branch.

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[1] Use of trade or brand names does not imply endorsement by DPR. Trademark ownership: Gore-Tex, W.L. Gore & Associates; Tyvek, E.I. duPont de Nemours; KLEENGUARD, Kimberly-Clark; SARANEX, Dow Chemical Company.

B. Granular Formulation: Requirements for **aerial or ground** application handlers who **will come into contact with** Ordram® 15-GM product.

1. Bag Handling Requirements
   (a) No person shall load more than 152,000 pounds of Ordram® 15-GM per season.
   (b) The employer shall maintain a record of persons loading Ordram® 15-GM and make these records available for inspection by the county agricultural commissioner or the Director, upon request. Records shall be kept as follows:
      (1) Name of person(s).
      (2) The date and total pounds of Ordram® 15-GM loaded per day.

2. Loaders or any persons having contact with or handling full, partial, or empty Ordram® 15-GM bags shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) A full-face respirator with either cartridge(s) approved for organic vapors with a dusts/mists prefilter approved for pesticides, or a canister approved for pesticides approved by the National Institute for Occupational Safety and Health (NIOSH) and/or Mine Safety and Health Administration (MSHA).
   (b) A tightly woven head covering.

3. Flaggers **NOT working in an enclosed cab**/vehicle shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) Protective eyewear (safety glasses).
   [Reference: *3 CCR section 6738(b)(1)(E)*]
   (b) A tightly woven head covering.

4. Flaggers **working in an enclosed cab**/vehicle shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) Protective eyewear.
   (b) The PPE required above in this section for flaggers shall be worn in addition to PPE required by the Ordram® 15-GM labeling when performing flagging activities outside of the enclosed cab/vehicle.
   [Reference: *3 CCR section 6738(i)(7)*]

*Continued on next page*

C. Granular Formulation: Requirements for **aerial or ground** application handlers **not involved** in mixing or loading Ordram® 15-GM product.

1. Pilots shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) Pilots involved in loading or equivalent activities (load leveling, washing windshields, handling the bucket sock, etc.) where they may come into contact with Ordram® 15-GM, shall wear the same PPE (apparel and devices) required for loaders in section I B.2 of these molinate (Ordram®) worker safety permit conditions.

2. Ground applicators **NOT** involved in mixing or loading Ordram® 15-GM, **NOT** having contact with or handling full, partial, or empty Ordram® 10-G and/or Ordram® 15-GM bags, and **NOT working in an enclosed cab** shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) A coverall or garments defined as a "coverall" in 3 CCR section 6000, UNDER either a cloth coverall or a disposable coverall made of synthetic materials capable of excluding particles 45 microns or larger in diameter. Examples of these are Tyvek Q®[1], KLEENGUARD®[1], polypropylene, or other brands of coverall approved by the DPR, Worker Health and Safety Branch.
   (b) A NIOSH and/or MSHA approved full-face respirator with either cartridges(s) approved for organic vapors with a dusts/mists prefilter approved for pesticides or a canister approved for pesticides.
   (b) A tightly woven head covering.

3. Ground applicators **NOT** involved in mixing or loading Ordram® 15-GM, **NOT** having contact with or handling full, partial, or empty Ordram® 15-GM bags, and **working in an enclosed cab** shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) A NIOSH and/or MSHA approved half-mask respirator with either cartridge(s) approved for organic vapors with a dusts/mists prefilter approved for pesticides or a canister approved for pesticides must be worn.
   (b) The PPE (apparel and devices) required above in this section for ground applicators and PPE required by the Ordram® GM labeling shall be worn if it is necessary to exit the enclosed cab and contact pesticide treated or contaminated surfaces.

*Continued on next page*

D. Liquid Formulation: Handling Requirements

1. Mixers and loaders who **will come in contact with** Ordram® 8-E product shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) A NIOSH and/or MSHA approved full-face respirator with either cartridge(s) approved for organic vapors with a prefilter approved for pesticides or a canister approved for pesticides.
   (b) A tightly woven head covering.

2. Applicators who **will come in contact with** Ordram® 8-E product shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 15-GM labeling:
   (a) A coverall, or garments defined as a "coverall" in 3 CCR section 6000, UNDER a chemical resistant coverall as specified in 3 CCR section 6738(g)(1). Examples of a chemical resistant coverall are rain suits, Tyvek QC®[1], Tyvek®[1] laminated with SARANEX®[1], polypropylene laminated with polyethylene, or other brands of coverall approved as chemical resistant by the DPR, Worker Health and Safety Branch.
   (a) A NIOSH and/or MSHA approved full-face respirator with either cartridge(s) approved for organic vapors with a prefilter approved for pesticides or a canister approved for pesticides.
   (b) A tightly woven head covering.

3. Applicators **NOT** involved in mixing or loading Ordram® 8-E and **working in an enclosed cab** shall wear the following PPE (apparel and devices) in addition to PPE required by the Ordram® 8-E labeling:
   (a) A NIOSH and/or MSHA approved half-mask respirator with either cartridge(s) approved for organic vapors with a prefilter approved for pesticides or a canister approved for pesticides must be worn unless the applicator is working in an enclosed cab acceptable for respiratory protection.

# Subsection C.2.5

## Phenoxy/Dicamba Herbicides

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I. The following requirements apply to Dicamba; 2,4-dichlorophenoxyacetic acid; 2,4-dichlorophenoxybutric acid; 2,4-dichlorophenoxypropionic acid; and 2-methyl-4-chlorophenoxyacetic acid (MCPA) herbicides when used on rice grown in the following areas of the Sacramento Valley:

A. The counties of Butte, Colusa, Glenn, Placer, Sutter, Yolo, Yuba; the portion of Sacramento County situated north of Highway 80; and the portion of Tehama County situated west of the Sacramento River.

B. No herbicide in an ester form shall be applied, unless expressly authorized by a permit issued by the country agricultural commissioner.

C. Restrictions on types of application.

1. Fixed-wing aircraft and helicopter applications are prohibited April 1 through October 15.

2. Ground equipment applications made between April 1 through October 15 shall be made in accordance with the following requirements:
   (a) Unless expressly authorized by permit, no application shall be made within two miles of any cultivated commercial cotton, grape, or pistachio planting.
   (b) Each operating nozzle shall produce a droplet size, in accordance with the manufacturers' specifications, not less than 500 microns volume median diameter (Dv0.5) with ten percent of the diameter by volume (Dv0.1) not less than 200 microns.

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# Subsection C.2.6

## Thiobencarb

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**Drift Minimization**

I. The use of Bolero 10G formulation is prohibited in the Sacramento Valley rice growing counties of Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo, and Yuba.

II. No aerial applications shall be made or continued within ½ mile of the Sacramento or Feather Rivers in the Sacramento Valley rice growing counties of Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo, and Yuba unless there is a continuous positive airflow away from the river.

III. In the Sacramento Valley rice growing counties of Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo, and Yuba, no aerial application shall be made or continued within ½ mile of the Sacramento or Feather Rivers when the wind speed exceeds seven miles per hour.

IV. In Sacramento and Yolo Counties, no aerial applications shall be made or continued within ¼ mile of the Sacramento River unless they are made under the direct supervision of the county agricultural commissioner's representative.

V. In Sacramento and Yolo Counties, the maximum acres treated by air each day within ¼ mile of the Sacramento River shall not exceed 33 percent of the average acres treated per day by air within this area in each county during 2002.

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**Water Management**

I. The following water holding requirements apply to rice fields treated with thiobencarb in the Sacramento Valley (north of the line defined by Roads E10 and 116 in Yolo County and the American River in Sacramento County), except those treated with Abolish® 8EC:

   A. Except as listed below, all water on treated fields must be retained on the treated fields for at least 30 days following application. When drainage begins, discharge must not exceed two inches of water over a drain box weir for seven additional days. Unregulated discharges from these fields may then begin after 37 days.

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*Continued on next page*

1. When water is contained within a tailwater recovery system, ponded on fallow land, or contained in other systems appropriate for preventing discharge, the water must be retained in the system for 19 days, unless:
   (a) The system is under the control of one permittee, then water may be discharged from the application site in a manner consistent with product labeling (14-day water hold).
   (b) The system includes drainage from more than one permittee, then water must be retained on the site of application for six days before being discharged from the application site into the system.
   (c) Water is on fields within the bounds of areas that discharge negligible amounts of rice field drainage into perennial streams until fields are drained for harvest. Water-hold may be reduced to six days if the commissioner evaluates such sites and verifies the hydrologic isolation of the fields.

II. Rice fields treated with thiobencarb in the Sacramento/San Joaquin Valley (south of the line defined by Roads E10 and 116 in Yolo County and the American River in Sacramento County), except those treated with Abolish® 8EC:

A. Except as listed below, all water on treated fields must be retained on the treated fields for at least 19 days following application. When drainage begins, water discharge must not exceed two inches of water over a drain box weir for an additional seven days. Unregulated discharges from these fields may begin after 26 days.

1. When water is contained within a tailwater recovery system, ponded on fallow land, or contained in other systems appropriate for preventing discharge, the system may discharge 19 days following the last application of thiobencarb within the system unless:
   (a) The system is under the control of one permittee, then water may be discharged from the application site in a manner consistent with product labeling (14-day water-hold period).
   (b) The system includes drainage from more than one permittee, then water must be retained on the site of application for six days before discharged from the application site into the system.
   (c) Water is on fields within the bounds of areas that discharge negligible amounts of rice field drainage into perennial streams until fields are drained for harvest. Water-hold may be reduced to six days, if the commissioner evaluates such sites and verifies the hydrologic isolation of the fields.

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III. All areas, fields treated with Abolish® 8EC:

A. Except as listed below, all water on treated fields must be retained on the treated fields for at least 19 days following application. When drainage begins, water discharge must be released at a volume not to exceed two inches of water over a drain box weir for an additional seven days. Unregulated discharges from these fields may begin after 26 days.

1. For water contained within a tailwater recovery system, ponded on fallow land, or contained in other systems appropriate for preventing discharge, the system may discharge 19 days following the last application within the system unless:
   (a) The system is under the control of one permittee, then water may be discharged from the application site in a manner consistent with product labeling (14-day water-hold period).
   (b) The system includes drainage from more than one permittee, then water must be retained on the site of application for six days before discharged from the application site into the system.
   (c) Water is on fields within the bounds of areas that discharge negligible amounts of rice field drainage into perennial streams until fields are drained for harvest, then water-hold may be reduced to six days if the commissioner evaluates such sites and verifies the hydrologic isolation of the fields.

IV. Emergency release requirements (Salinity damage):

The county agricultural commissioner may authorize the emergency release of field water after a minimum 19-day water-hold period after the last thiobencarb application, following the review of a written application that demonstrates salinity levels are damaging to the crop.

A. Applicants for such emergency releases must provide the following information:
   1. All information indicated on the emergency release request (Form A), including a description of the severity and extent of salinity damage.
   2. Electrical conductivity (EC) measurements, expressed as deciSiemens per meter (dS/m) or microSiemens per centimeter ($\mu$S/cm), from field water in each paddy suspected of having salinity problems. To most effectively demonstrate salinity problems, measurements should be taken wherever salinity problems are evident.

*Continued on next page*

3. The instrument (make and model) used to determine EC measurements. The instrument must have a sensitivity range that accommodates the full range of EC values in intake and paddy water (usually a range of 0-5.0 dS/m or 0-5,000 $\mu$S/cm should be sufficient) and should have a resolution of not less than five percent. The instrument must be calibrated according to the manufacturer's instructions. The applicant must specify the method of temperature compensation (i.e., automatic, conversion table).
4. Who made the EC measurements.
5. The source of irrigation water (e.g., district supply canal, drainage canal, well, etc.).

B. An emergency release may be granted only if all of the following conditions are satisfied:
   1. All required information is provided.
   2. Water management requirements for rice pesticides other than thiobencarb are satisfied.
   3. EC of paddy water exceeds 2.0 dS/m or 2,000 $\mu$S/cm.
   4. The county agricultural commissioner or his/her staff inspects the site.

C. Water may be released from paddies where EC measurements exceed 2.0 dS/m or 2,000 $\mu$S/cm and from paddies down gradient from such paddies within the same field. Water shall only be released in an amount necessary to mitigate the salinity problem.

D. Those issued an emergency release must submit to the county agricultural commissioner, a report (Form B) indicating the time and duration of the emergency release and data that can be used to calculate the total amount of water released during the emergency release.

# Appendix C.3

# Ground Water Protection Approved Alternative Management Practices

**Introduction**

Pursuant to 3 CCR section 6487.4(h)(1), DPR approved the following alternative management practices.

**Restriction**

Section 6487.4 prohibits the use of restricted materials listed in 3 CCR section 6400(d) in a ground water protection area unless one of several specified management practices is designated on the permit and put in place by the permittee. In addition to those practices listed in the regulations, the following have been approved by DPR.

**Alternative approved practices**

When using a restricted material listed in section 6400(d):

- Band applications to **citrus** trees may be extended to the drip line of the tree, even if the band width exceeds the 33 percent of the distance between the tree rows currently allowed.
- Soil in a **citrus** grove does not need to be disturbed prior to application from the drip line of the tree to the row of the same tree, even if that distance exceeds 33 percent of the distance between tree rows.
- The pesticide does not need to be incorporated in **citrus** from the drip line of the tree row to the row of the same tree, even if that distance exceeds 33 percent of the distance between tree rows.
- The pesticide may be applied to the tops and outer sides of canal banks and rights-of-way provided that runoff moves off the treated area as overland flow onto adjacent land, at least equal in area to the treated area, where it infiltrates into the soil with no chance of flow into specified structures.
- The pesticide may be applied where irrigation and rainfall runoff from the treated site is stored on the treated site in an excavated retention area with a percolation rate of greater than 0.2 inches per hour if the runoff is completely recycled every 24 hours from the retention area onto the treated site or neighboring land under certain circumstances.

# Section C.4

# Suggested Permit Conditions for Carbofuran (Furadan)

**"Special conditions"**

We have included these additional suggested conditions for your consideration. They need not be generally applied to all sites. They are to be employed only when the county agricultural commissioner (CAC) determines that additional mitigation is necessary due to special circumstances. They are as follows:

1. Provide an alternate source of moisture in cases where the surrounding area is dry. This may be accomplished by irrigating blocks that are not being treated.
2. Do not make applications on nights when the full or nearly full moon is likely to cause birds to be more active.
3. Eliminate leaf litter, trash, and weeds in the vineyard.
4. Remove weeds from under emitters. Disk and throw earth on the berms.
5. Use frightening devices to scare birds from the vineyard until flushing is complete.
6. Delay applications until birds leave the area for the winter.
7. Use below ground emitters.
8. Look for and eliminate puddles after application and irrigation in soils where puddling is known to occur.
9. The property operator will survey the entire treated area for dead birds within 24 hours of the completion of the application and flushing. Carcasses will be gathered and refrigerated; contact the Department of Fish and Game (DFG) or CAC for disposal instructions.

DFG may want to analyze carcasses, whether bird or animal, found in or around fields treated with Furadan and has requested permittees submit the carcasses directly to DFG personnel or to the CAC, as instructed.

The Department of Pesticide Regulation has reviewed these special conditions and feels that they provide mitigation measures for problematic situations that had not been previously identified.

# Section C.5

## Recommended Permit Conditions for Tribufos (DEF, Folex)

| | |
|---|---|
| **Introduction** | Approved tribufos labeling states, "(Tribufos) may not be applied within seven days of harvest." The Department of Pesticide Regulation considers this enforceable pre harvest interval language. Any harvesting taking place within seven days of the application is a violation of Food and Agricultural Code section 12973 (use in conflict with labeling). |
| **Permit condition language** | No employee shall be directed or allowed to conduct any activities that may involve human contact with foliage, within the treated area, until seven days after an application of tribufos. |
| **Former title of this section** | Recommended Permit Conditions for S,S,S-tributyl phosphorotrithioate (DEF, Tribufos) |

# Section C.6

# Commodity Fumigation

**Introduction**

This section provides information on Commodity Fumigation.

Information on Soil Fumigation may be found in Section C.7.

**In this section**

This section provides the following Subsection.


| Subsection / Topic | See Page… |
|---|---|
| C.6.1—Methyl Bromide and Sulfuryl Fluoride | C-31 |
| C.6.2—Tarped Potting Soil Fumigation | C-36 |

# Subsection C.6.1

## Recommended Permit Conditions for Methyl Bromide and Sulfuryl Fluoride Commodity Fumigation

**Introduction**

This document describes the recommended permit conditions for commodity fumigations at facilities. The permit conditions are designed to prevent the risk of acute exposures from the off-site movement of the fumigant to persons living near fumigation facilities. The following topics are included:

- Work site plan;
- Recommended permit conditions;
- Final permit conditions.

**NOTE**: Most permit conditions apply to both fumigants, however, be aware that some apply to only one fumigant or the other.

**Permit issuance**

Title 3, CCR section 6420 allows non-agricultural use permits to be issued to the facility operator, the pest control business, or both parties. DPR's position is that the option of who is required to obtain the permit rests with the CAC.

It is DPR’s determination that when there is a fumigation of a commodity during storage or processing (industrial use) and the application is performed by a pest control business, both the facility operator and the pest control business have different duties with respect to the permit conditions. To be held responsible for their respective duties, both must be issued written permit conditions through the permitting process. Issue the primary permit to the facility operator.

If the facility does not have a certified applicator (qualified applicator certificate) on staff or chooses to hire a licensed pest control business to make the application, condition the permit to require all applications be conducted by a licensed agricultural pest control business. Require the pest control business to obtain a separate permit. As an alternative, the CAC may require that the business be specifically named in the facility permit and that a copy of the permit conditions be provided to that business.

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# Recommended Permit Conditions for Methyl Bromide and Sulfuryl Fluoride Commodity Fumigation, Continued

**Permit process**

The following steps are required to obtain the restricted materials permit for methyl bromide or sulfuryl fluoride commodity fumigations:

1. The facility that will conduct the fumigation prepares a work site plan. The work site plan documents the characteristics and procedures for a specific site.
2. Upon completion, the work site plan is forwarded to the county agricultural commissioner for review.
3. The CAC reviews the work site plan.
4. After the CAC reviews the work site plan, any modifications to the original work site plan are discussed with the applicator. Evaluation of individual work site plans may reveal one or more of the permit conditions as inappropriate for a specific site. In this case, a proposed alternative should be developed. DPR is available to assist the CAC in the evaluation of alternative mitigations.
5. Once the work site plan is approved, the CAC issues the restricted materials permit using the final work site plan, which details the equipment and procedural requirements that must be followed in order to use methyl bromide or sulfuryl fluoride, as conditions of the permit. The permit should be conditioned upon compliance with the approved final work site plan.

**Intent of the permit conditions**

Permit conditions are meant to be guidelines for typical fumigations. Because of the wide variety of fumigation types, some of the permit conditions may be inappropriate for certain applications. In such cases, the CAC may issue site-specific permit conditions. The site-specific permit conditions will consist of the requirements given here and/or alternative conditions based on information in the individual work site plan. Methyl bromide and sulfuryl fluoride users are encouraged to suggest alternatives in the work site plan which will mitigate exposure. The CAC will evaluate requests for alternative conditions and consult with DPR to determine if the request will mitigate the exposure.

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# Recommended Permit Conditions for Methyl Bromide and Sulfuryl Fluoride Commodity Fumigation, Continued

**Major concepts**

The permit conditions are based on four concepts which methyl bromide and sulfuryl fluoride users should keep in mind: **containment**, **dilution**, **distance,** and **time**.

- First, high concentrations of the fumigants should be contained. This means fumigation equipment and the fumigation structure or enclosure should not leak.
- Second, when the fumigants are not contained, dilute it with fresh air.
- Third, keep as much distance as possible between the fumigants and people.
- Fourth, minimize the time people are exposed to the fumigants. The permit conditions use the interaction of these four concepts to minimize exposure. For example, when one is not achieved, the other three are used to compensate.

While mitigation measures based on these concepts can decrease the methyl bromide and sulfuryl fluoride exposure to the desired levels, the best way to decrease exposure is to use as little of the fumigant as possible. Particularly, when better containment is provided, it may be possible to decrease the amount of the fumigants and still achieve efficacy. Users will find that as less methyl bromide and sulfuryl fluoride is used, the permit conditions become less obstructive and alternative conditions are easier to implement.

The permit conditions also require various approved test procedures to be used.

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# Recommended Permit Conditions for Methyl Bromide and Sulfuryl Fluoride Commodity Fumigation, Continued

**Definitions** The following definitions are categorized.

**General terms**

| | |
|---|---|
| A: Enclosure | A single fumigated space.<br><br>*Examples: a single chamber, single silo, single sea/land container, or a single group of bins under one tarpaulin.* |
| B: Enclosed Area | A gas-confining area surrounded by non-porous walls and a roof. |
| C: Control Room | A small enclosed room adjoining some fumigation enclosures (e.g., primarily chambers) used exclusively for introducing fumigant into an enclosure and/or monitoring its concentration. |
| D: Fumiscope | A monitoring instrument which reads the concentration of fumigant in ounces per 1000 cubic feet inside an enclosure. |
| E: Loss Ratio | The proportion of fumigant per hour which leaks from the enclosure during the treatment period. This ratio is determined by a DPR-approved retention test. |
| F: Mechanical Ventilation | The use of fans or any mechanical device to ventilate a fumigation enclosure, or an enclosed area where fumigated commodities are stored. |
| G: Mitigation Measures | Modified work practices or engineering controls to comply with the stated permit conditions or alternative permit conditions. |
| H: Non-Residential Facility | Facilities where commodities are stored or processed. They do not include any structures where people live. |
| I: Passive Ventilation | Non-mechanical ventilation (e.g., opening doors and removing tarpaulin cover) of a fumigation enclosure. |
| J: Secondary Enclosed Area | An **enclosed area** surrounding a fumigation enclosure. This is usually a structure (e.g., warehouse, production facility, etc.) that houses the fumigation enclosure. This does not include mesh screen or other porous barriers. |
| K: Work Site | A location where one or more enclosures are fumigated.<br><br>*Example: several chambers or sea/land containers at one address.* |

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# Recommended Permit Conditions for Methyl Bromide and Sulfuryl Fluoride Commodity Fumigation, Continued

**Retention categories, Aeration categories**

| | |
|---|---|
| L: Pressure Tested | Either a vacuum chamber or an enclosure which has been pressure tested following the procedures stated in the U.S. Department of Agriculture Plant Protection and Quarantine Treatment Manual. |
| M: Retention Tested | An enclosure that has been measured for loss of fumigant over time according to a DPR-approved procedure. |
| N: Untested | An enclosure that has not been pressure or retention tested. |
| O: Standard Height Exhaust Stack | An exhaust stack that is at least 10 feet above the enclosure's highest point, and at least 10 feet above any major obstruction within 200 feet of the stack, and at least as tall as the appropriate value in Table 1.<br>*Examples of major obstructions: houses, mature orchards, silos* |
| P: Exit Velocity | The air speed through the exhaust stack during aeration. The exit velocity is determined by dividing the rated fan capacity (cubic feet per minute) by the stack cross-sectional area (square feet). |
| Q: Minimum Exhaust Stack | An exhaust stack that does not meet the conditions for a standard height exhaust stack, but is at least 15 feet above the ground and has an exit velocity of at least 600 feet per minute. |
| R: No Stack | An enclosure whose stack does not meet either the standard height or minimum qualifications, or which does not use a stack for aeration. |

**Buffer zones**

| | |
|---|---|
| S: Treatment Zone | A buffer zone that is maintained around an enclosure during the fumigation treatment period (exposure or holding period). Only persons supervising and performing fumigation activities are permitted in the treatment zone. All other people, including residents and workers, must be excluded from this zone. |
| T: Aeration Zone | A buffer zone that is maintained around an enclosure during the first portion of the aeration period (four hours or less, depending on the emission concentration). Only persons supervising and performing fumigation activities are permitted in the aeration zone. All other people, including residents and workers, must be excluded from this zone. |

# Subsection C.6.2

## Recommended Permit Conditions for Tarped Potting Soil Fumigation

### I. DEFINITIONS

A. **Application** includes treatment and aeration; it is complete when the tarped potting soil has been aerated.

B. **Application rate**, in pounds per cubic yard, is equal to the amount of methyl bromide in the formulated product.

C. **Application site** means the location where the fumigations take place. A property operator may have more than one location where potting soil fumigations take place. If these locations are not contiguous, then there would be two **application sites**. The application site designation may also be used in the restricted materials permit and for pesticide use reporting purposes.

D. **Buffer zone** is the area that must be maintained between the treated potting soil and those places where people conduct certain activities or practices. These activities and practices may not occur in the buffer zone for prescribed periods of time. For potting soil fumigations there are three types of buffer zones to be considered:

1. **Resident Buffer Zone** is the area surrounding the treated potting soil, during fumigation and aeration, <u>outside</u> of which people may "dwell." The Resident Buffer Zone is in effect until aeration is complete. See the definition: **dwell**.

2. **Worker Buffer Zone** is the area surrounding the treated potting soil, during fumigation and aeration, <u>outside</u> of which people may "work or occupy." The Worker Buffer Zone is in effect until aeration is complete, except for the first four hours of aeration (see **Aeration Buffer Zone**). See the definition: **work or occupy**.

3. **Aeration Buffer Zone** is the area surrounding the treated potting soil that begins when the tarps are cut or removed and lasts for the first four hours of aeration. This buffer zone is the same size as the Resident Buffer Zone and applies to **all** activities.

E. **Dwell** means that a person is able to or will occupy a structure for any or all parts of a 24-hour period. This includes, but is not limited to: homes, hospitals, convalescent homes, boarding schools, hotels, and apartment complexes.

F. **Frequency of applications** refers to the interval of time elapsed from the beginning of the application of methyl bromide to one potting soil pile to the beginning of the application of methyl bromide to another potting soil pile.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

### I. DEFINITIONS (Continued)

G. **Gas confining** means a structure that has a non-porous roof and walls and all doors, side panels, and vents remain closed.

H. **Pesticide Handler** includes employees involved in fumigation, aeration activities, tarp repair, and tarp removal **prior** to the completion of aeration.

I. **Potting soil** is any combination of soil and/or soil-less media that is used for growing plants.

J. **Work or occupy** means that a person is able to or will be at a place for eight hours or less. This includes, but is not limited to: fields, offices, warehouses, stores, malls, factories, greenhouses, packing sheds, workshops, and recreational parks.

### II. WORKER SAFETY REQUIREMENTS

#### A. Restricted Entry and Warning Sign Posting Requirements

1. The restricted entry interval begins with the introduction of the fumigant and ends 48 hours after the tarp is removed **and** measurements show 5 ppm or less methyl bromide in the air at the surface of the treated potting soil pile. The duration of the restricted entry interval depends upon whether the tarp is removed or cut prior to removal.

2. As a condition of the permit, warning signs shall be posted on/near the treated pile for the duration of the restricted entry interval.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

### II. WORKER SAFETY REQUIREMENTS (Continued)

#### B. Pesticide Handler and Field Worker Requirements

1. The employer must maintain use records for **all** employees involved in application, aeration, tarp repair, and tarp removal activities. The record shall identify the person, work activity(ies), date(s), duration of handling, U.S. Environmental Protection Agency Registration Number, and brand name of the methyl bromide product handled.

2. The employer must maintain records of the air monitoring used to determine completeness of aeration. These records must include sampling method, date, time, sample location(s), and the level, in parts per million (ppm).

3. The employer must maintain these records at a central location for two years and make them available to the county agricultural commissioner upon request for review.

4. Employers shall ensure that all employees who are pesticide handlers are trained and protected. **Pesticide handlers** include all persons whose work activities involve application, tarp repair, and tarp removal.

#### C. Tarpaulin Repair

1. The tarpaulin is considered "application equipment" covered by 3 CCR section 6742(a) and is required to be kept in good repair by the **applicator** for the duration of the fumigation. For the purpose of this section, fumigation ends when the tarps are removed or cut for aeration. **The person or business performing methyl bromide fumigations is responsible for making any necessary repairs.**

2. Tarpaulin repair must be evaluated on a job-by-job basis. The decision should be based on hazard to the public or workers, size of the damaged area, timing of damage, and ease of repair.

3. The methyl bromide label requires **all persons wear a Self-Contained Breathing Apparatus** if entering an area where the concentration of methyl bromide is unknown or exceeds 5 ppm. This includes making repairs to the tarp that covers a potting soil pile under fumigation.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

## II. WORKER SAFETY REQUIREMENTS (Continued)

### D. Workers in Adjacent Sites

1. The property operator and/or pest control operator must be aware of adjacent sites where worker activity is likely until aeration is complete. They must ensure that the adjacent property operators are advised, prior to the fumigation, on how to comply with the **Worker Buffer Zone <u>and</u>** the **Aeration Buffer Zone**.

2. The property operator and/or pest control operator may give notice to adjoining property operators orally or in writing.

3. If entry occurs as the result of a failure to be aware of worker activity and subsequent failure to advise adjacent property operators to keep workers out, the operator of the property fumigated and the person performing pest control are in violation of the methyl bromide permit conditions.

## III. APPLICATION REQUIREMENTS

A. All potting soil fumigations shall be conducted outdoors or in an enclosure that is not gas-confining.

A. A maximum of 400 cubic yards of potting soil, in one or more tarped piles, will be allowed to be fumigated and aerated at one location. All treated potting soil must be completely aerated before another potting soil fumigation may begin at the same location.

C. Maximum pile height is two feet tall. Potting soil may be fumigated in containers or raised structures as long as the depth of the potting soil does not exceed two feet.

D. For multiple potting soil fumigation:

1. Piles can be considered “isolated” when they are separated by at least 1,300 feet.

2. Piles can also be consider isolated when they are separated by at least 48 hours from the introduction **and** tarpaulin cutting of one pile to the introduction and tarpaulin cutting of another pile. For example, multiple piles can be considered isolated:

## III. APPLICATION REQUIREMENTS (Continued)

i. When introduction takes place at 48-hour intervals (e.g., introduction of Pile 1 on October 1 and introduction of Pile 2 on October 3).
ii. When tarpaulin cutting takes place at 48-hour intervals (e.g., tarpaulin cutting of Pile 1 on October 1 and tarpaulin cutting of Pile 2 on October 3).
iii. When introduction and tarpaulin cutting occur alternately at 48-hour intervals (e.g., tarpaulin cutting of Pile 1 on October 1 and introduction of Pile 2 on October 3).

3. For isolated piles, calculate buffer zones independently for each pile.

E. For non-isolated piles, calculate buffer zones by aggregating the volume of the piles. This is the same procedure for calculating buffer zones for isolated and non-isolated field fumigations.

F. A maximum of 0.6 pounds of methyl bromide (active ingredient) per cubic yard is allowed.

G. The methyl bromide must be injected through perforated tubing that is anchored in place within the tarped potting soil piles. Follow the pesticide registrant's recommendation for the type of application tubing to be used.

H. The tarp shall be sealed to the ground with sand or water snakes.

I. All fittings, connections, and valves between the supply tank and the tarpaulin must be checked for methyl bromide leaks prior to fumigation. If cylinders are replaced during the fumigation process, the connections and valves must be checked for leaks prior to continuing the job.

J. <u>Only the tarpaulins listed on the approved manufacturers list are to be used.</u> The tarp used during the fumigation must meet or exceed the following standards for a “high barrier” tarp: a permeability factor of less than eight milliliters methyl bromide per hour per square meter per 1,000 ppm of methyl bromide under the tarp at 30 degrees Celsius. See the list of high barrier tarp suppliers. Polyethylene tarp of six-mil thickness or greater meets these criteria.

K. No other types of methyl bromide applications may be conducted at the same application site for 48 hours before, or 24 hours following, a tarped potting soil fumigation.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

## IV. BUFFER ZONE DETERMINATION

A. A buffer zone is the area surrounding a fumigated potting soil pile outside of which certain activities or practices are allowed. The buffer zones are in effect until the potting soil is completely aerated. The size of the buffer zone will be determined by the proposed size of the potting soil pile, in cubic yards, and the application rate. The buffer zone distance may have to be modified for each pile due to the proximity to occupied structures, distance to adjacent workers, and proximity to other potting soil fumigations.

B. The buffer zone is partitioned into the Resident Buffer Zone, the Worker Buffer Zone, and the Aeration Buffer Zone. The size of the Resident Buffer Zone is based on the assumption that a person may "dwell" at a place for **24 hours.** The size of the Worker Buffer Zone is based on the assumption that people work or recreate at a place for **eight hours or less.** The Aeration Buffer Zone becomes effective at the time the tarp is removed or cut and lasts for four hours. It is the same size as the Resident Buffer Zone and is required due to the high levels of methyl bromide released when the tarp is removed or cut.

C. Transit through the Worker Buffer Zone by the permittee's employees is limited to infrequent and unavoidable trips. Routine or repeated transit through this buffer zone is prohibited.

D. Transit through (except on a public road), working in, or dwelling in the Aeration Buffer Zone is prohibited for the entire four hours. No one is allowed in this area until aeration is complete unless they are trained pesticide handlers facilitating aeration.

E. The buffer zones begin at the edges of the treated piles and extend in all directions regardless of buildings or property boundaries.

F. Procedures:

1. Determine the application rate. Use the highest application rate if more than one pile will be fumigated. If the application rate is not identical to the values listed in Table 1, then round up to the next highest value.

2. Determine the volume. If there will be more than one pile, use the total volume of all piles fumigated at the same time as at the same application site. If the volume is not identical to the values listed in Table 1, then round up to the next highest value.

3. Determine the Resident Buffer Zone by applying the highest application rate and total volume to Table 1.

## IV. BUFFER ZONE DETERMINATION (Continued)

4. Determine the Worker Buffer Zone by dividing the application rate by three. Apply the adjusted application rate and total volume to Table 1. If the adjusted application rate is not identical to the values listed in Table 1, then round up to the next highest value.

5. The Aeration Buffer Zone is the same size as the Resident Buffer Zone and must be vacated by **all people** for the first four hours of aeration, starting when the tarp is first cut or removed.

G. Resident Buffer Zone Duration

1. To determine if the proposed Resident Buffer Zone includes places where people are living or staying, measure the distance between the edge of the tarped pile and the **physical structure,** not the property line associated with that structure.

2. People are not allowed to "dwell" within the Resident Buffer Zone. Residences within the buffer zone **must** be vacated while the buffer zone is in effect. This time period starts when the fumigation begins and ends when aeration is complete, at least 48 hours after tarp removal.

3. If the resident(s) are unable to vacate the building(s), then the property operator must decrease either the cubic yards to be treated or the rate of methyl bromide to be used to reduce the size of the buffer zone.

4. This requirement applies to all persons, including the property operator.

H. Worker Buffer Zone Duration

1. People will not be allowed to work in or occupy the Worker Buffer Zone. This time period starts when the fumigation begins and ends when aeration is complete, at least 48 hours after tarp removal. The beginning point of measurement shall be the tarped edge of the fumigated pile.

2. If there are occupied commercial buildings or workers within the proposed Worker Buffer Zone and the work sites cannot be vacated, then the application must either be rescheduled to coincide with the worker's day-off or the cubic yards to be treated and/or application rate must be decreased to reduce the size of the buffer zone.

## IV. BUFFER ZONE DETERMINATION (Continued)

I. Aeration Buffer Zone Size and Duration

1. The Aeration Buffer Zone is the same size as the Resident Buffer Zone.

2. The Aeration Buffer Zone is in effect for the first four hours of aeration, which begins when the tarp is removed or cut. No one is allowed to work in, reside in, or transit this area for **any length of time.** This is required due to the large amounts of methyl bromide that can be released when the tarp is first disturbed.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

## V. NOTICE OF INTENT MODIFICATION

A. The county agricultural commissioner must receive a Notice of Intent at least 24 hours prior to commencement of a methyl bromide fumigation of tarped potting soil piles. The Notice of Intent must indicate the day and hour the application is to commence.

B. Unless a waiver is granted by the county agricultural commissioner, fumigation of a tarped potting soil pile must not commence sooner than the starting time on the Notice of Intent. Nor must the fumigation commence later than 12 hours after the intended starting time submitted on the Notice of Intent. If the potting soil fumigation does not commence within this time frame, a new Notice of Intent must be submitted, but no 24-hour waiting period is required unless notified by the county agricultural commissioner.

C. For multiple potting soil piles to be fumigated sequentially, the county agricultural commissioner may allow one Notice of Intent with a "schedule" to be submitted in lieu of one Notice of Intent for each potting soil pile to be fumigated. The schedule must include a map and must specify the date and time each potting soil pile is intended to be fumigated.

D. The 24-hour Notice of Intent waiting period may be waived if the county agricultural commissioner determines:

   1. Effective pest control cannot be attained otherwise, or

   2. Approaching climatic conditions require the application to take place sooner, or

   3. Twenty-four hours are not necessary to adequately evaluate the intended application.

E. The reasons for granting each waiver must be documented and a record maintained by the county agricultural commissioner.

F. The operator of the property to be treated and the person performing pest control (if they are different) must be aware of adjacent sites where there is a reasonable possibility of **work activity** occurring while the Worker Buffer Zone and Aeration Buffer Zone are in effect, and must ensure that operators of those adjacent properties are advised to keep **workers** out of those areas during that period of time.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

### VI. TARPAULIN REMOVAL

A. Aeration shall be commenced during daylight hours, not at night.

B. A Self-Contained Breathing Apparatus shall be used to commence aeration, which includes removing or cutting the tarp, unless this activity can be performed from outside of the aeration zone.

C. The tarp may be removed no sooner than three days (72 hours) after the potting soil pile was fumigated.

D. If the tarps are cut, rather than removed completely, they must be allowed to aerate for a minimum of 24 hours following cutting. Workers may then be allowed to remove the cut tarps without using a Self-Contained Breathing Apparatus.

E. After the tarps have been removed, regardless of method, the soil pile must be allowed to aerate for an additional two days (48 hours) before workers may disturb the pile. At that time, if spot measurement shows less than 5 ppm, the soil can be handled by the workers. If the measurement is above 5 ppm, aeration shall continue until the level of methyl bromide is below 5 ppm.

   The measurement(s) should be taken as close as possible to the surface of the treated potting soil pile.

### VII. LIST OF MANUFACTURERS OF HIGH BARRIER TARPAULINS

The current list of approved tarpaulins is available at DPR's web site at:
http://www.cdpr.ca.gov/docs/dprdocs/methbrom/fum_regs.htm

Under the section, **Methyl Bromide**, select **Approved tarpaulins**.

## RECOMMENDED PERMIT CONDITIONS FOR TARPED POTTING SOIL FUMIGATION

### TABLE 1. Buffer Zones (feet) for Potting Soil Fumigations

| Volume | | Application Rate* | | | | | |
|---|---|---|---|---|---|---|---|
| cubic yards | cubic feet | 0.1 lbs/yd$^3$<br>0.37 lbs/100 ft$^3$<br>3.7 lbs/1000 ft$^3$ | 0.2 lbs/yd$^3$<br>0.74 lbs/100 ft$^3$<br>7.4 lbs/1000 ft$^3$ | 0.3 lbs/yd$^3$<br>1.1 lbs/100 ft$^3$<br>11 lbs/1000 ft$^3$ | 0.4 lbs/yd$^3$<br>1.5 lbs/100 ft$^3$<br>15 lbs/1000 ft$^3$ | 0.5 lbs/yd$^3$<br>1.9 lbs/100 ft$^3$<br>19 lbs/1000 ft$^3$ | 0.6 lbs/yd$^3$<br>2.2 lbs/100 ft$^3$<br>22 lbs/1000 ft$^3$ |
| 20 | 540 | 30 | 30 | 30 | 30 | 30 | 30 |
| 30 | 810 | 30 | 30 | 30 | 30 | 30 | 40 |
| 40 | 1080 | 30 | 30 | 30 | 30 | 40 | 60 |
| 60 | 1620 | 30 | 30 | 30 | 45 | 70 | 95 |
| 80 | 2160 | 30 | 30 | 35 | 65 | 95 | 120 |
| 100 | 2700 | 30 | 30 | 45 | 85 | 115 | 140 |
| 150 | 4050 | 30 | 30 | 75 | 120 | 155 | 190 |
| 200 | 5400 | 30 | 40 | 100 | 150 | 190 | 230 |
| 250 | 6750 | 30 | 50 | 120 | 175 | 225 | 265 |
| 300 | 8100 | 30 | 65 | 140 | 200 | 250 | 300 |
| 350 | 9450 | 35 | 80 | 155 | 220 | 280 | 330 |
| 400 | 10800 | 40 | 100 | 175 | 245 | 300 | 355 |

* Application Rate Units:

lbs/yd$^3$ = pounds per cubic yard
lbs/100 ft$^3$ = pounds per 100 cubic feet
lbs/1000 ft$^3$ = pounds per 1000 cubic feet

# Commodity Fumigation Facility Work Site Plan

This Work Site Plan has five sections:
**Section A** records general information about the work site.
**Section B** records compliance with general permit conditions.
**Section C** is used to determine the size of the buffer zones.
**Section D** records compliance with other specific conditions.
**Section E** records information for alternate conditions.

The Work Site Plan must be completed and submitted to the CAC. Restricted Materials Permits must be obtained by both the facility operator and pest control business, if applicable.

**A Restricted Materials Permit cannot be issued unless all questions in the appropriate sections are answered correctly. Incorrect information on the Work Site Plan will result in denial of the permit.**

**Fumigation Site:**

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone:
(Facility Operator, Grower, QAC, QAL, etc.)

**Pest Control Business:** _____ Permit Number:

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone:
(QAL with the appropriate category)

I VERIFY THE FOLLOWING INFORMATION IS ACCURATE AND TRUE TO THE BEST OF MY KNOWLEDGE.

Signature: _____ Date: _____
(Facility Operator)

Title: _____

**Consult with the County Agricultural Commissioner for suggestions on alternative conditions.**

| | | | | |
|---|---|---|---|---|
| **B.1: Maximum Application Rate** | *(Condition 1)*. Will your application rate be eight pounds per 1000 cubic feet or less?<br><br>If question B.1 is answered NO, you must complete Section E. | YES | NO | |
| **B.2: Total Fumigant** | *(Condition 2)*. Will you be using 1000 pounds or less of sulfuryl fluoride or methyl bromide at the work site during a 24-hour period?<br><br>If question B.2 is answered NO, you must complete Section E. | YES | NO | |
| **B.3: Other Types of Applications** | This permit condition does not apply to sulfuryl fluoride applications. | N/A | N/A | |
| **B.4: Enclosed Areas** | *(Condition 4)*. Is the fumigation enclosure outside of other buildings (i.e., not within a secondary enclosed area)? | YES | NO | |
| **B.5: Common Walls** | *(Condition 4)*. Is the fumigation enclosure physically separated from all other structures (i.e., the fumigation enclosure does not share a common wall with another building)? | YES | NO | |
| **B.6: Outside Introduction** | *(Condition 5)*. Is the fumigant introduced from outside the enclosure? | YES | NO | |
| **B.7: Gas-tight Fumigant Lines** | *(Condition 6)*. Are fumigant lines and connections checked for leaks during each fumigation? | YES | NO | |

**If concentrations within the enclosure are monitored with a Fumiscope or other instrument, are the following precautions taken?**

| | | | | |
|---|---|---|---|---|
| **B.8: Test Equipment Seals** | *(Condition 7)*. Is the enclosure sealed where instrument sampling lines pass through enclosure walls? | YES | NO | does not apply |
| **B.9: Test Equipment Exhaust** | *(Condition 8)*. Is the exhaust from the monitoring instrument vented out of the control room or back into the enclosure? | YES | NO | does not apply |

**If fumigant is introduced from within an enclosed control room, are the following precautions taken?**

| | | | | |
|---|---|---|---|---|
| **B.10: Fumigant Line Purge** | *(Condition 9)*. Is nitrogen gas or compressed air used to purge fumigant lines prior to changing cylinders? | YES | NO | does not apply |
| **B.11: Control Room Ventilation** | *(Condition 10)*. Is the control room mechanically ventilated when people are present? | YES | NO | does not apply |
| **B.12: Control Room Storage** | *(Condition 11)*. Are fumigant cylinders stored outside the control room? | YES | NO | does not apply |
| **B.13: Aeration Initiation** | *(Condition 12)*. Is a Self Contained Breathing Apparatus worn when initiating aeration? | YES | NO | |
| **B.14: Minimum Aeration Time** | *(Condition 14)*. If the enclosure is aerated with mechanical ventilation, is the aeration period at least four hours? | YES | NO | does not apply |
| **B.15: Minimum Aeration Time** | *(Condition 14)*. If the enclosure is aerated passively, is the aeration period at least 12 hours? | YES | NO | does not apply |
| **B.16: Testing Aeration Completeness** | *(Condition 15)*. Is the air concentration checked according to approved procedures before moving the commodity from the enclosure? | YES | NO | does not apply |

**If the treated commodity is stored in an enclosed area, are the following precautions taken?**

| | | | | |
|---|---|---|---|---|
| **B.17: Storage Area Testing** | *(Condition 16).* Is the air concentration within the enclosed area checked according to DPR approved procedures before people enter? | YES | NO | does not apply |
| **B.18: Storage Area Work Schedule** | *(Condition 16).* Do workers spend less than one hour in a 24-hour period inside the enclosed storage area? | YES | NO | does not apply |
| **B.19: Document Requirements** | *(Condition 18).* Are all test results kept for 2 years? | YES | NO | does not apply |

**Alternate Conditions** - Describe alternatives if any of the questions in Section B were answered NO.

**The information in this section is used by the County Agricultural Commissioner to determine the size of the buffer zones <u>for each enclosure</u> at the work site. Complete this section <u>for each enclosure</u>, unless the answers to all of the questions for all enclosures are the same.**

| | | | | |
|---|---|---|---|---|
| **Retention Category** | C.1. Is the enclosure a vacuum chamber? | YES | NO | |
| **Determination** | C.2. Does the enclosure pass the USDA pressure test? | YES | NO | |
| | C.3. Has the enclosure been retention tested according to DPR-approved procedures? | YES | NO | |
| **Aeration Category Determination** | C.4. Does the enclosure use an exhaust stack for aeration?<br><br>***If C.4 is answered NO, skip C.5 – C.11 and go to question C.12.*** | YES | NO | |

| | | | | |
|---|---|---|---|---|
| | C.5. What is the exhaust stack's height above ground level? Use lowest stack if more than 1. | _____feet | | |
| | C.6. Is the top of the exhaust stack at least 10 feet above the enclosure's highest point? | YES | NO | |
| | C.7. Is the top of the exhaust stack at least 10 feet above all major obstructions (building, silo, orchard) within 200 feet of the stack? | YES | NO | |
| | C.8. What is the rated fan capacity or air flow rate of the exhaust fan for this enclosure (combine all fans if more than one)? | _____cubic feet per minute | | |
| | C.9. What is the stack cross-sectional area for this enclosure (combine all stacks)?<br>Area of circle = 3.14 x radius$^2$ | _____square feet | | |
| | C.10. Divide the value from question C.8 by the value from question C.9. This is the exit velocity. | _____feet per minute | | |
| | C.11. What is the largest amount of fumigant that will be used for the entire work site in a 24-hour period? | _____ pounds | | |

| | | | |
|---|---|---|---|
| **Fumigation Information** | C.12. What is the highest application rate that will be used for this enclosure? | _____pounds per 1000 cubic feet | |
| | C.13. What is the maximum number of fumigations in a 24-hour period for this enclosure? | _____ | |
| | C.14. What is the fumigated volume for this enclosure? | _____cubic feet | |
| | C.15. What is the maximum amount of fumigant used in a 24-hour period for this enclosure? | _____pounds | |
| | C.16. What is the duration of the longest treatment period? | _____ hours | |
| | C.17. If this enclosure has been retention tested according to a DPR approved test, what is the loss ratio (proportion of fumigant leaked from the enclosure per hour)? | _____ | does not apply |
| **Other Enclosures** | C.18. Give the name, identification or designation for this enclosure: | _____ | |
| | C.19. List any other enclosures that have the same answers to all of the questions in Section C. | _____<br>_____ | |
| | C.20. List any other enclosures that may be fumigated or aerated within the same 24-hour period and how many times they may be used. | _____<br>_____ | |

**Complete this section <u>for each enclosure</u>, unless all of the answers are the same.**

| | | | | |
|---|---|---|---|---|
| **D.1: Vertical Stack Exhaust** | *(Condition 21).* If one or more stacks are used to aerate, are they vented vertically to the outside air? | YES | NO | does not apply |
| **D.2: Unobstructed Exhaust** | *(Condition 21).* If one or more stacks are used to aerate, are the tops of the stacks free of overhead obstructions during aeration? | YES | NO | does not apply |
| **D.3: Daylight Aeration** | *(Conditions 13 and 22).* Do you always initiate aeration during daylight hours? | YES | NO | |

**<u>Alternate Conditions</u> - Describe alternatives if any of the questions in Section D were answered NO. Attach additional pages if necessary.**

**Complete this section only if alternate conditions need to be evaluated by the Department of Pesticide Regulation. Consult with the County Agricultural Commissioner before filling out this section. This section must be completed for each enclosure for which alternate conditions are being requested.**

E.1. Enclosure Identification:

E.2. Description of Enclosure:
(chamber, tarped bins)

E.3. Enclosure Material (plastic tarp, wood):

E.4. Enclosure Dimensions:

E.5. Description of Secondary Enclosed Space (if any):

E.6. Secondary Enclosed Space Dimensions (if any):

E.7. Commodity/Site Fumigated:

E.8. Months Fumigations Conducted (e.g., Jan-Dec):

E.9. Months of Peak Season (e.g., Jan-Dec):

E.10. Number of Fumigations Per Week During Peak Season:

E.11. Aeration Duration (hours or days):

E.12. Treated Commodity Storage Area Description:

E.13. Treated Commodity Storage Area Dimensions:

E.14. Description of Work Activities in Storage Area (if any):

_____

_____

_____

_____

_____

E.15. Identify permit condition(s) for which alternate conditions are being requested:

_____

_____

_____

_____

_____

_____

E.16. Describe suggested alternate conditions. If no specific alternate conditions can be suggested, identify which of the following general mitigation measures are possible:

- Containment (better containment of fumigant within the enclosure)
- Dilution (dilute the released fumigant with fresh air)
- Distance (increase the distance between the fumigant and people)
- Time (decrease the time people are exposed)

_____

_____

_____

_____

_____

_____

_____

_____

_____

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**1: Maximum Application Rate**

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

**2: Total Methyl Bromide**

The total amount of methyl bromide per work site must not exceed 1000 pounds in a 24-hour period.

**3: Other Types of Applications**

No other types of methyl bromide applications (e.g., field, greenhouse, potting soil, structural) can occur at the work site for the preceding 48 hours or the following 24 hours of a commodity application. Other commodity fumigations can be conducted.

**4: Enclosed Area and Common Walls**

The following types of fumigations are prohibited unless mitigation options are identified in the Work Site Plan:

- those inside an enclosed area with people present
- enclosures which share a common wall with another enclosed area with people present

*Examples: A tarpaulin fumigation inside a warehouse is prohibited. Using a chamber which shares a common wall with an office is prohibited.*

**GENERAL CONDITIONS**
Fumigation Equipment and Introduction

**5: Outside Introduction**

Application from outside the enclosure through a closed system is required. Releasing methyl bromide from inside the enclosure is prohibited unless mitigation options are identified in the Work Site Plan.

**6: Gas-tight Fumigant Lines**

All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment.

*Examples: When changing methyl bromide cylinders, the connection between the introduction line and the cylinder must be checked for leaks. The cylinder valve must be checked for leaks after opening.*

**7: Test Equipment Seals**

The enclosure must be sealed where instrument sampling lines pass through enclosure walls.

*Example: Fumiscope leads must be placed and the hole at the chamber or enclosure wall sealed prior to the fumigation.*

**8: Test Equipment Exhaust**

Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure.

**9: Fumigant Line Purge**

When introducing methyl bromide from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

**10: Control Room Ventilation**

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

**11: Control Room Storage**

Methyl bromide cylinders must not be stored inside enclosed control rooms.

NOTE: The following conditions pertain to aeration of the fumigation enclosure, not aeration of areas where commodities are stored, except when they are the same.

**12: Aeration Initiation**

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA). Exception: enclosures for which aeration is initiated remotely, such as chambers.

*Examples: breaking seals on tarpaulin fumigations, opening sea/land container doors*

**13: Aeration During Daylight**

Aeration must be initiated during daylight hours. Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

**14: Minimum Aeration Times**

Enclosures must be aerated for the following minimum duration:

a. Four hours if mechanically ventilated using fans, or
b. 12 hours if passively ventilated

**Note**: The duration of the aeration period should not be confused with the time the aeration zone is in place. The aeration zone is in place for only the first portion of the aeration: four hours at most.

**15: Testing Aeration Completeness**

The concentration of methyl bromide in the air spaces between the stacked commodity must be less than 5 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

**16: Enclosed Storage Areas**

Methyl bromide concentrations in enclosed areas (e.g., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 5 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.
**Note**: This condition pertains to areas where commodities are stored, not the fumigation enclosure, except when they are the same.

**17: Work Site Plan**

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit. A completed Work Site Plan must be submitted to the CAC for evaluation before a Restricted Materials Permit will be issued.

**18: Test Results Documentation**

The enclosure operator must keep records of all test results for two years and make them available to the CAC and workers (pursuant to Labor Code Section 6408 and Cal-OSHA regulations Title 8, Section 3204) upon request.

## Fumigation Enclosure Types

There are specific conditions for each of six different types of fumigation enclosures. The enclosures are classified by the combination of two factors: the amount of methyl bromide the enclosure retains and the method used to aerate. There are two retention categories: pressure tested and retention tested/untested; and three aeration methods: standard height stack, minimum stack, and no stack. These two retention categories and three aeration categories give the six possible combinations of fumigation enclosures listed below:

A1 - Pressure Tested/Standard Height Stack (e.g., quarantine or vacuum chamber)

A2 - Pressure Tested/Minimum Stack (e.g., quarantine or vacuum chamber)

A3 - Pressure Tested/No Stack (e.g., quarantine chamber without a stack)

B1 - Retention Tested or Untested/Standard Height Stack (e.g., typical chamber)

B2 - Retention Tested or Untested/Minimum Stack (e.g., "Butler" with short stack)

B3 - Retention Tested or Untested/No Stack (e.g., tarp fumigation)

## Buffer Zones

The amount of time a person spends in areas around commodity fumigations must be limited in order to minimize exposure. Exposure is limited by restricting a person's access to or time spent in areas near enclosures being fumigated or aerated. The size of the buffer zones depends on which of the six types of enclosures is being used. For certain types of enclosures, the amount of methyl bromide used and retained in the enclosure also influences the size of the buffer zone. There are two types of buffer zones: treatment zone and aeration zone. There can be different sizes of treatment zones because of differences in exposure duration. For example, nearby workers would have a smaller treatment zone if they worked for 12 hours, compared to nearby residents who would have a treatment zone based on a 24-hour exposure. A summary of the treatment zones and aeration zones for the various types of fumigations appears in Chart 1.

**Enclosure Description**

A pressure tested/standard height enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

*Examples: a quarantine chamber with a tall stack; a vacuum chamber with a tall stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration During Daylight**

Does not apply. Aeration may occur at any time.

**Enclosure Description**

A pressure tested/minimum stack enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.

*Examples: a quarantine chamber with a short stack; a vacuum chamber with a short stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 3, page C-71, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

**Enclosure Description**

A pressure tested/no stack enclosure is a vacuum chamber or has passed the USDA pressure test, and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.

*Example: a quarantine chamber with no stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 4, page C-72, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

Does not apply.

**22: Aeration During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

## Enclosure Description

A retention tested or untested/standard height stack enclosure may retain a large or small proportion of the methyl bromide and the exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any building within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.
**Note**: The size of the treatment zone may be minimized by measuring how well the enclosure retains methyl bromide and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical chamber with a tall stack; a "Butler" tank with a tall stack; a building with a tall stack.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-60, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

## 22: Aeration During Daylight

Does not apply. Aeration may occur at any time.

## Enclosure Description

A retention tested or untested/minimum stack enclosure may retain a large or small proportion of the methyl bromide. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.
**Note**: The size of the treatment zone may be minimized by measuring how well the enclosure retains methyl bromide and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a chamber with a short stack; a building exhausted through the roof.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-70, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12- hour work shift and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone as specified in Table 3, page C-71, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

## 22: Aeration During Daylight

Aeration must be initiated during daylight hours (see permit condition 13).

## Enclosure Description

A retention tested or untested/no stack enclosure may retain a large or small proportion of the methyl bromide and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.
**Note**: The size of the buffer zones may be minimized by measuring how well the enclosure retains methyl bromide and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical sea/land container; a building exhausted through open doors and windows; a typical tarpaulin fumigation.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-70, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone as specified in Table 4, page C-72, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

Does not apply.

## 22: Aeration During Daylight

Aeration must be initiated during daylight hours (see permit condition 13).

## RECOMMENDED PERMIT CONDITIONS

**Methyl Bromide**
**Commodity Fumigation**

**CHART 1**
Summary of Buffer Zone Sizes

| Retention Category | Aeration Method | Class | Treatment Zone Size | Aeration Zone Size | Aerate Daylight Hours Only |
|---|---|---|---|---|---|
| Pressure Tested *(USDA pressure test)* | Standard Height Stack *(Table 1 requirements)** | A1 | 10 feet | 10 feet | NO |
| | Minimum Stack *(stack 15 ft above ground & exit velocity >600 ft/min)* | A2 | 10 feet | Table 3 | YES |
| | No Stack | A3 | 10 feet | Table 4 | YES |
| Retention Tested or Untested *(DPR-approved test or no test)* | Standard Height Stack *(Table 1 requirements)** | B1 | Table 2 | 10 feet | NO |
| | Minimum Stack *(stack 15 ft above ground & exit velocity >600 ft/min)* | B2 | Table 2 | Table 3 | YES |
| | No Stack | B3 | Table 2 | Table 4 | YES |

* The stack must be at least 10 feet above the enclosure's highest point and at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

# RECOMMENDED PERMIT CONDITIONS

**Methyl Bromide**
**Commodity Fumigation**

**TABLE 1**
Standard Height Exhaust Stack

This table is used to determine the "standard height" (feet) of a stack. A "standard height" exhaust stack is one which is:

1. at least 10 feet above the enclosure's highest point, and
2. at least 10 feet above any major obstruction within 200 feet of the stack, and
3. at least as tall (above ground level) as the appropriate value in the table below

Total Amount of Methyl Bromide Applied (pounds) at the Work Site in a 24-hour Period ROUND UP

| Exit Velocity (feet per minute)* | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 600 | 21 | 23 | 26 | 28 | 30 | 32 | 34 | 37 | 39 | 41 | 43 | 45 | 48 | 50 | 52 | 54 | 57 | 59 | 61 | 63 |
| 700 | 19 | 21 | 23 | 25 | 28 | 30 | 32 | 34 | 36 | 39 | 41 | 43 | 45 | 47 | 50 | 52 | 54 | 56 | 58 | 61 |
| 800 | 16 | 18 | 21 | 23 | 25 | 27 | 30 | 32 | 34 | 36 | 38 | 41 | 43 | 45 | 47 | 49 | 52 | 54 | 56 | 58 |
| 900 | 15 | 16 | 18 | 20 | 23 | 25 | 27 | 29 | 31 | 34 | 36 | 38 | 40 | 43 | 45 | 47 | 49 | 51 | 54 | 56 |
| 1000 | 15 | 15 | 16 | 18 | 20 | 22 | 25 | 27 | 29 | 31 | 33 | 36 | 38 | 40 | 42 | 45 | 47 | 49 | 51 | 53 |
| 1100 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 29 | 31 | 33 | 35 | 38 | 40 | 42 | 44 | 46 | 49 | 51 |
| 1200 | 15 | 15 | 15 | 15 | 15 | 18 | 20 | 22 | 24 | 26 | 29 | 31 | 33 | 35 | 37 | 40 | 42 | 44 | 46 | 48 |
| 1300 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 22 | 24 | 26 | 28 | 31 | 33 | 35 | 37 | 39 | 42 | 44 | 46 |
| 1400 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 24 | 26 | 28 | 30 | 32 | 35 | 37 | 39 | 41 | 44 |
| 1500 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 23 | 26 | 28 | 30 | 32 | 34 | 37 | 39 | 41 |
| 1600 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 23 | 25 | 28 | 30 | 32 | 34 | 36 | 39 |
| 1700 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 19 | 21 | 23 | 25 | 27 | 30 | 32 | 34 | 36 |
| 1800 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 23 | 25 | 27 | 29 | 32 | 34 |
| 1900 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 25 | 27 | 29 | 31 |
| 2000 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 29 |
| 2100 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 18 | 20 | 22 | 24 | 26 |
| 2200 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 20 | 22 | 24 |
| 2300 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 |
| 2400 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 |
| 2500 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 |

ROUND DOWN

$$\text{*Exit Velocity} = \frac{\text{Rated Fan Capacity (cubic feet per minute)}}{\text{Stack Cross-Sectional Area (square feet)}}$$

area of circle = $3.14 \times \text{radius}^2$

# RECOMMENDED PERMIT CONDITIONS
**Methyl Bromide**
**Commodity Fumigation**

**TABLE 2**
Treatment Zone Sizes for
Retention Tested and Untested Enclosures

This table is used to determine the treatment zone size (feet) surrounding enclosures which are retention tested or untested. Consult with the County Agricultural Commissioner to determine the sizes for multiple fumigations in a 24-hour period.

Concentration Lost (pounds per 1000 cubic feet)* ROUND UP

| Volume Fumigated in a 24-hour Period (cubic feet) ROUND UP | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 2000 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 3000 | 30 | 30 | 30 | 30 | 30 | 30 | 35 | 40 | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| 4000 | 30 | 30 | 30 | 30 | 30 | 40 | 50 | 55 | 65 | 70 | 80 | 85 | 90 | 95 | 100 |
| 6000 | 30 | 30 | 30 | 35 | 50 | 60 | 70 | 80 | 90 | 95 | 105 | 110 | 120 | 125 | 130 |
| 8000 | 30 | 30 | 30 | 50 | 65 | 80 | 90 | 100 | 110 | 120 | 125 | 135 | 140 | 150 | 155 |
| 10000 | 30 | 30 | 45 | 65 | 85 | 100 | 115 | 125 | 135 | 145 | 160 | 165 | 175 | 185 | 195 |
| 15000 | 30 | 30 | 60 | 80 | 100 | 120 | 130 | 145 | 160 | 170 | 180 | 190 | 200 | 210 | 220 |
| 20000 | 30 | 40 | 70 | 95 | 115 | 135 | 150 | 170 | 180 | 195 | 205 | 220 | 230 | 240 | 250 |
| 25000 | 30 | 45 | 80 | 105 | 130 | 150 | 170 | 185 | 200 | 215 | 230 | 240 | 255 | 265 | 275 |
| 30000 | 30 | 55 | 90 | 120 | 145 | 165 | 185 | 205 | 220 | 235 | 250 | 265 | 280 | 290 | 305 |
| 35000 | 30 | 60 | 100 | 130 | 160 | 180 | 200 | 225 | 240 | 255 | 275 | 290 | 300 | 315 | 330 |
| 40000 | 30 | 65 | 110 | 145 | 175 | 200 | 220 | 240 | 260 | 280 | 295 | 310 | 325 | 340 | 355 |
| 45000 | 30 | 75 | 120 | 155 | 185 | 210 | 235 | 260 | 280 | 295 | 315 | 335 | 350 | 365 | 380 |
| 50000 | 35 | 80 | 130 | 165 | 200 | 230 | 250 | 275 | 300 | 320 | 340 | 355 | 370 | 390 | 405 |
| 60000 | 40 | 95 | 145 | 185 | 225 | 255 | 285 | 310 | 335 | 355 | 380 | 400 | 420 | 440 | 455 |
| 70000 | 45 | 105 | 165 | 210 | 250 | 285 | 315 | 345 | 370 | 395 | 420 | 440 | 460 | 485 | 505 |
| 80000 | 50 | 115 | 180 | 225 | 270 | 305 | 340 | 375 | 400 | 425 | 455 | 480 | 500 | 525 | 545 |
| 90000 | 55 | 125 | 190 | 240 | 290 | 330 | 365 | 400 | 430 | 455 | 485 | 510 | 535 | 560 | 585 |
| 100000 | 60 | 135 | 205 | 260 | 310 | 355 | 390 | 430 | 460 | 490 | 525 | 550 | 575 | 605 | 625 |
| 110000 | 65 | 145 | 220 | 280 | 335 | 380 | 420 | 460 | 490 | 525 | 560 | 585 | 615 | 645 | 670 |
| 120000 | 70 | 155 | 235 | 295 | 350 | 400 | 440 | 485 | 520 | 555 | 590 | 620 | 650 | 680 | 705 |
| 130000 | 75 | 165 | 245 | 310 | 370 | 420 | 465 | 510 | 545 | 580 | 620 | 650 | 680 | 715 | 740 |
| 140000 | 80 | 175 | 260 | 325 | 390 | 440 | 485 | 535 | 570 | 610 | 650 | 680 | 715 | 745 | 775 |
| 150000 | 85 | 180 | 270 | 340 | 405 | 460 | 505 | 555 | 595 | 635 | 675 | 710 | 745 | 780 | 810 |
| 170000 | 90 | 195 | 295 | 370 | 435 | 495 | 545 | 600 | 640 | 685 | 730 | 765 | 800 | 840 | 870 |
| 190000 | 95 | 210 | 315 | 390 | 465 | 530 | 580 | 640 | 685 | 730 | 775 | 815 | 850 | 895 | 930 |
| 210000 | 100 | 225 | 330 | 415 | 490 | 560 | 615 | 675 | 725 | 770 | 820 | 860 | 900 | 945 | 980 |
| 230000 | 105 | 235 | 350 | 435 | 515 | 585 | 645 | 710 | 760 | 810 | 860 | 905 | 945 | 990 | 1030 |
| 250000 | 110 | 250 | 365 | 455 | 540 | 615 | 675 | 740 | 795 | 845 | 900 | 945 | 990 | 1035 | 1075 |

* The Concentration Lost is calculated from the application rate, exposure duration and loss ratio (proportion of methyl bromide leaked from the enclosure), according to the formula below. The exposure duration for workers is 12 hours or the treatment duration, whichever is less. The exposure duration for residents is the duration of treatment (24 hours maximum). The loss ratio is determined from a DPR-approved test; for untested enclosures use **0.030**.

Concentration Lost = [Application Rate (pounds per 1000 cubic feet)] × [Exposure Duration (hours)] × [Loss Ratio]

**TABLE 3**
Aeration Zone Sizes for Minimum Stacks

This table is used to determine the aeration zone size (feet) required **during the aeration** of enclosures with exhaust stacks having the following characteristics:

1. The top of the exhaust stack is at least 15 feet above ground level, and
2. The exit velocity is at least 600 feet per minute

$$\text{Exit Velocity} = \frac{\text{Rated Fan Capacity (cubic feet per minute)}}{\text{Stack Cross-Sectional Area (square feet)}}$$

| Total Retained in a 24-hour Period (pounds)* | Aeration Zone (feet) |
|---|---|
| 50 | 10 |
| 51 | 220 |
| ROUND UP 100 | 220 |
| 150 | 360 |
| 200 | 490 |
| 250 | 610 |
| 300 | 720 |
| 350 | 820 |
| 400 | 920 |
| 450 | 1000 |
| 500 | 1090 |
| 550 | 1170 |
| 600 | 1250 |
| 650 | 1320 |
| 700 | 1390 |
| 750 | 1460 |
| 800 | 1530 |
| 850 | 1600 |
| 900 | 1670 |
| 950 | 1730 |
| 1000 | 1790 |

* The Total Retained is calculated from the amount of methyl bromide, treatment duration and loss ratio (proportion of methyl bromide leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

Proportion Retained** = 1 – [Treatment Duration (hours) × Loss Ratio]

**For untested enclosures, use **0.90** for the Proportion Retained

Total Retained = [Amount of Methyl Bromide Applied in a 24-hour Period (pounds)] × [Proportion Retained]

# RECOMMENDED PERMIT CONDITIONS

**Methyl Bromide**
**Commodity Fumigation**

**TABLE 4**
Aeration Zone Sites for No Stacks

This table is used to determine the aeration zone size (feet) of enclosures that have no stack. Consult with the county agricultural commissioner to determine the aeration zone size when aerating multiple enclosures in a 24-hour period.

Concentration Retained (pounds per 1000 cubic feet)* ROUND UP

| Volume Aerated in a 24-hour Period (cubic feet) ROUND UP | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 | 2.4 | 2.8 | 3.2 | 3.6 | 4.0 | 4.4 | 4.8 | 5.2 | 5.6 | 6.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 30 | 30 | 30 | 30 | 30 | 30 | 40 | 50 | 60 | 70 | 75 | 85 | 90 | 95 | 105 |
| 2000 | 30 | 30 | 30 | 40 | 60 | 75 | 90 | 100 | 115 | 125 | 135 | 145 | 155 | 160 | 170 |
| 3000 | 30 | 30 | 45 | 70 | 90 | 110 | 125 | 140 | 155 | 165 | 180 | 190 | 200 | 210 | 220 |
| 4000 | 30 | 30 | 65 | 95 | 115 | 135 | 155 | 170 | 185 | 200 | 215 | 225 | 240 | 250 | 260 |
| 6000 | 30 | 55 | 100 | 130 | 160 | 180 | 205 | 225 | 240 | 260 | 275 | 290 | 305 | 320 | 335 |
| 8000 | 35 | 80 | 125 | 165 | 195 | 220 | 245 | 265 | 290 | 305 | 325 | 345 | 360 | 375 | 390 |
| 10000 | 50 | 105 | 155 | 195 | 225 | 255 | 285 | 310 | 330 | 350 | 375 | 390 | 410 | 430 | 445 |
| 15000 | 65 | 140 | 200 | 250 | 290 | 330 | 360 | 395 | 420 | 450 | 475 | 500 | 525 | 545 | 565 |
| 20000 | 80 | 175 | 240 | 300 | 345 | 390 | 425 | 460 | 495 | 525 | 560 | 585 | 615 | 640 | 665 |
| 25000 | 95 | 200 | 275 | 340 | 390 | 440 | 480 | 520 | 560 | 595 | 630 | 660 | 695 | 725 | 750 |
| 30000 | 110 | 225 | 305 | 375 | 430 | 485 | 530 | 575 | 615 | 655 | 695 | 730 | 765 | 795 | 830 |
| 35000 | 125 | 245 | 335 | 410 | 470 | 525 | 575 | 625 | 670 | 710 | 750 | 790 | 830 | 865 | 900 |
| 40000 | 135 | 265 | 360 | 440 | 505 | 565 | 620 | 670 | 720 | 765 | 810 | 850 | 890 | 930 | 965 |
| 45000 | 145 | 285 | 385 | 470 | 540 | 600 | 660 | 715 | 765 | 815 | 860 | 905 | 945 | 990 | 1030 |
| 50000 | 160 | 305 | 410 | 495 | 570 | 635 | 700 | 755 | 810 | 860 | 910 | 955 | 1000 | 1045 | 1090 |
| 60000 | 180 | 340 | 455 | 550 | 630 | 705 | 770 | 835 | 895 | 950 | 1005 | 1060 | 1110 | 1155 | 1205 |
| 70000 | 200 | 370 | 495 | 600 | 685 | 765 | 840 | 910 | 975 | 1035 | 1095 | 1150 | 1205 | 1260 | 1315 |
| 80000 | 220 | 400 | 535 | 645 | 740 | 830 | 905 | 980 | 1050 | 1120 | 1180 | 1245 | 1305 | 1360 | 1420 |
| 90000 | 235 | 430 | 575 | 690 | 795 | 885 | 970 | 1050 | 1125 | 1195 | 1265 | 1330 | 1395 | 1460 | 1520 |
| 100000 | 255 | 460 | 615 | 735 | 845 | 945 | 1035 | 1120 | 1200 | 1275 | 1350 | 1420 | 1485 | 1555 | 1620 |
| 110000 | 270 | 490 | 650 | 780 | 895 | 1000 | 1095 | 1185 | 1270 | 1350 | 1425 | 1500 | 1575 | 1645 | 1710 |
| 120000 | 285 | 515 | 685 | 820 | 945 | 1050 | 1155 | 1245 | 1335 | 1420 | 1505 | 1580 | 1660 | 1730 | 1805 |
| 130000 | 300 | 545 | 720 | 865 | 990 | 1105 | 1210 | 1310 | 1400 | 1490 | 1575 | 1660 | 1740 | 1820 | 1895 |
| 140000 | 315 | 570 | 750 | 905 | 1035 | 1155 | 1265 | 1370 | 1465 | 1560 | 1650 | 1735 | 1820 | 1900 | 1980 |
| 150000 | 330 | 595 | 785 | 945 | 1080 | 1205 | 1320 | 1425 | 1530 | 1625 | 1720 | 1810 | 1895 | 1980 | 2065 |
| 170000 | 360 | 640 | 845 | 1015 | 1160 | 1295 | 1420 | 1535 | 1640 | 1745 | 1845 | 1940 | 2035 | 2125 | 2215 |
| 190000 | 385 | 685 | 905 | 1080 | 1240 | 1380 | 1510 | 1630 | 1745 | 1855 | 1960 | 2065 | 2165 | 2260 | 2355 |
| 210000 | 410 | 725 | 955 | 1140 | 1305 | 1450 | 1590 | 1715 | 1835 | 1950 | 2060 | 2165 | 2270 | 2370 | 2470 |
| 230000 | 430 | 760 | 995 | 1190 | 1360 | 1515 | 1655 | 1785 | 1910 | 2030 | 2140 | 2250 | 2355 | 2460 | 2560 |
| 250000 | 450 | 785 | 1030 | 1230 | 1405 | 1560 | 1705 | 1840 | 1965 | 2085 | 2200 | 2315 | 2420 | 2525 | 2625 |

* The Concentration Retained is calculated from the rate, treatment duration and loss ratio (proportion of methyl bromide leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

Proportion Retained** = 1 – [Treatment Duration (hours) × Loss Ratio]

**For untested enclosures, use **0.90** for the Proportion Retained

Concentration Retained = [Application Rate (pounds per 1000 cubic feet)] × [Proportion Retained]

# FINAL PERMIT CONDITIONS

**Methyl Bromide**
**Commodity Fumigation**

**GENERAL INFORMATION**

**Fumigation Site**: _____ Permit Number: _____

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone: _____
(Facility Operator, Grower, QAC, QAL, etc.)

**Pest Control Business**: _____ Permit Number: _____

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone: _____
(QAL with the appropriate category)

I VERIFY THAT THE ATTACHED PERMIT CONDITIONS WILL BE FOLLOWED

Permit Applicant: _____ Date: _____
(Facility Operator)

## 1: Maximum Application Rate

Work Site Plan B.1

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*See page C-61 for possible additional restrictions to comply with the buffer zones.*

## 2: Total Methyl Bromide

Work Site Plan B.2

The total amount of methyl bromide per work site must not exceed 1000 pounds in a 24-hour period.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*See page C-61 for possible additional restrictions to comply with the buffer zones.*

## 3: Other Types of Applications

Work Site Plan B.3

No other types of methyl bromide applications (e.g., field, greenhouse, potting soil, structural) can occur at the work site for the preceding 48 hours or the following 24 hours of a commodity application.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 4: Enclosed Area and Common Walls

Work Site Plan B.4 & 5

The following types of fumigations are prohibited:

- those inside an enclosed area with people present
- enclosures which share a common wall with another enclosed area with people present

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

**5: Outside Introduction**

Application from outside the enclosure through a closed system is required. Releasing methyl bromide from inside the enclosure is prohibited.

Work Site Plan B.6

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

**6: Gas-tight Fumigant Lines**

All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment.

Work Site Plan B.7

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

**7: Test Equipment Seals**

The enclosure must be sealed where instrument sampling lines pass through enclosure walls.

Work Site Plan B.8

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

**8: Test Equipment Exhaust**

Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure.

Work Site Plan B.9

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

### 9: Fumigant Line Purge

When introducing methyl bromide from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

Work Site Plan B.10

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

### 10: Control Room Ventilation

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

Work Site Plan B.11

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

### 11: Control Room Storage

Methyl bromide cylinders must not be stored inside enclosed control rooms.

Work Site Plan B.12

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 12: Aeration Initiation

Work Site Plan B.13

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA). Exception: enclosures for which aeration is initiated remotely, such as chambers.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 13: Aeration During Daylight

Work Site Plan D.3

Aeration must be initiated during daylight hours. Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 14: Minimum Aeration Times

Work Site Plan B.14 & B.15

Enclosures must be aerated for the following minimum duration:

a. 4 hours if mechanically ventilated using fans, or
b. 12 hours if passively ventilated

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 15: Testing Aeration Completeness

Work Site Plan B.16

The concentration of methyl bromide in the air spaces between the stacked commodity must be less than 5 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 16: Enclosed Storage Areas

Work Site Plan
B.17 & B.18

Methyl bromide concentrations in enclosed areas (i.e., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 5 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 17: Work Site Plan

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 18: Test Results Documentation

Work Site Plan B.19

The enclosure operator must keep records of all test results for 2 years and make them available to the County Agricultural Commissioner and workers upon request.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*This part needs to be completed for each enclosure.*

## Enclosure Identification/Description: _____

(check one)

Work Site Plan C.1 - 11

☐ A1 - Pressure Tested/Standard Height Stack
☐ A2 - Pressure Tested/Minimum Stack
☐ A3 - Pressure Tested/No Stack
☐ B1 - Retention Tested or Untested/Standard Height Stack
☐ B2 - Retention Tested or Untested/Minimum Stack
☐ B3 - Retention Tested or Untested/No Stack

## Ancillary Buffer Zone Requirements:

Maximum Application Rate: _____

Maximum Fumigated Volume: _____

Treatment Duration: _____

Other Enclosures Which May Be Used Within 24 hrs: _____

### 19: Treatment Zone

Work Site Plan C.12 - 20

A treatment zone of _____ feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. A separate treatment zone of _____ feet for workers may be used.

### 20: Aeration Zone

Work Site Plan C.12 - 20

An aeration zone of _____ feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 5 ppm.

### 21: Vertical Stack Exhaust

Work Site Plan D.1, D.2

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

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# SULFURYL FLUORIDE PERMIT CONDITIONS -- DECISION TABLE

| **If the fumigation type is:** | **And the total amount used will be:** | **Your permit conditions start on:** |
|---|---|---|
| Non-Residential Processing & Storage Facilities | **< 4500 lbs** | Page C-82 |
| Non-Residential Processing & Storage Facilities | **> 4500 lbs** | The CAC will refer your information to DPR. DPR will prepare a custom site plan for your fumigation. |
| Commodity | **Any amount** | Page C-30 |

**Sulfuryl Fluoride Permit Conditions for Non-Residential (Enclosed Areas), Less than or equal to 4500 lbs**

1) **General Requirement for Use of ProFume©®:** Restricted material permits for the use of ProFume©® shall not be issued to a facility operator and/or pest control operator who has not received a Dow AgroSciences certification showing they have attended a ProFume©® stewardship training meeting.

2) **Restricted Material Permit Conditions for Sulfuryl Fluoride Use in Nonresidential Facilities (Enclosed areas)**
   a) For fumigations where **less than or equal to 4500 lbs** of sulfuryl fluoride will be applied within a 24 hour period, the following permit conditions apply:
      i) **Buffer zone requirements**:
         (1) **Duration**: A buffer zone must be maintained during fumigation and through the completion of aeration.
         (2) **Distance**: Use Table 1 to determine buffer zone distance based on the target fumigation concentration that will be maintained (oz SF/1000 ft3).
         (3) **Occupation**: The buffer zone extends from the edge of the fumigated building. There may not be any occupied structures within the buffer zone. Only persons supervising and performing fumigation activities are permitted in the buffer zone. Exception: Transit along public thoroughfares is allowed.
      ii) **Aeration Requirements**:
         (1) Minimum fumigant release height above ground level: 50 feet.
         (2) Aeration must be initiated during daylight hours:
            (a) Not later than one hour prior to sunset, and
            (b) Not earlier than one hour following sunrise.

**Table 1** – Use table to determine the buffer zone distance from edge of the fumigation facility to the nearest occupied structure.

| *Targeted Fumigation Conc. (oz/1000ft3)* | *Buffer Zone Distance (ft)* |
|---|---|
| 16 | 30 |
| 32 | 60 |
| 48 | 100 |
| 64 | 140 |
| 80 | 180 |
| 96 | 220 |
| 112 | 260 |
| 128 | 300 |

**1: Maximum Application Rate**

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

**2: Total Sulfuryl Fluoride**

The total amount of sulfuryl fluoride per work site must not exceed 1000 pounds in a 24-hour period.

**3: Other Types of Applications**

This permit condition does not apply to sulfuryl fluoride applications.

**4: Enclosed Area and Common Walls**

The following types of fumigations are prohibited unless mitigation options are identified in the Work Site Plan:

- those inside an enclosed area with people present
- enclosures which share a common wall with another enclosed area with people present

*Examples: A tarpaulin fumigation inside a warehouse is prohibited. Using a chamber which shares a common wall with an office is prohibited.*

**5: Outside Introduction**

Application from outside the enclosure through a closed system is required. Releasing fumigant from inside the enclosure is prohibited unless mitigation options are identified in the Work Site Plan.

**6: Gas-tight Fumigant Lines**

All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment.

> *Examples: When changing* sulfuryl fluoride *cylinders, the connection between the introduction line and the cylinder must be checked for leaks. The cylinder valve must be checked for leaks after opening.*

**7: Test Equipment Seals**

The enclosure must be sealed where instrument sampling lines pass through enclosure walls.

> *Example: Fumiscope leads must be placed and the hole at the chamber or enclosure wall sealed prior to the fumigation.*

**8: Test Equipment Exhaust**

Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure.

**9: Fumigant Line Purge**

When introducing fumigant from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

**10: Control Room Ventilation**

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

**11: Control Room Storage**

Sulfuryl fluoride cylinders must not be stored inside enclosed control rooms.

NOTE: The following conditions pertain to aeration of the fumigation enclosure, not aeration of areas where commodities are stored, except when they are the same.

**12: Aeration Initiation**

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA). Exception: enclosures for which aeration is initiated remotely, such as chambers.

*Examples requiring SCBA: breaking seals on tarpaulin fumigations, opening sea/land container doors*

**13: Aeration During Daylight**

Aeration must be initiated during daylight hours[1]. Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

**14: Minimum Aeration Times**

Enclosures must be aerated for the following minimum duration:

a. Four hours if mechanically ventilated using fans, or
b. 12 hours if passively ventilated

**Note**: The duration of the aeration period should not be confused with the time the aeration zone is in place. The aeration zone is in place for only the first portion of the aeration: four hours at most.

**15: Testing Aeration Completeness**

The concentration of sulfuryl fluoride in the air spaces between the stacked commodity must be less than 1 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

[1] Daylight hours = Not later than one hour prior to sunset and not earlier than one hour following sunrise.

**16: Enclosed Storage Areas**

Sulfuryl fluoride concentrations in enclosed areas (i.e., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 1 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.
**Note**: This condition pertains to areas where commodities are stored, not the fumigation enclosure, except when they are the same.

**17: Work Site Plan**

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit. A completed Work Site Plan must be submitted to the CAC for evaluation before a Restricted Materials Permit will be issued.

**18: Test Results Documentation**

The enclosure operator must keep records of all test results for two years and make them available to the CAC and workers (pursuant to Labor Code section 6408 and Cal-OSHA regulations Title 8, section 3204) upon request.

## Fumigation Enclosure Types

There are specific conditions for each of six different types of fumigation enclosures. The enclosures are classified by the combination of two factors: the amount of fumigant the enclosure retains and the method used to aerate. There are two retention categories: pressure tested and retention tested/untested; and three aeration methods: standard height stack, minimum stack, and no stack. These two retention categories and three aeration categories give the six possible combinations of fumigation enclosures listed below:

A1 - Pressure Tested/Standard Height Stack (e.g., quarantine or vacuum chamber)

A2 - Pressure Tested/Minimum Stack (e.g., quarantine or vacuum chamber)

A3 - Pressure Tested/No Stack (e.g., quarantine chamber without a stack)

B1 - Retention Tested or Untested/Standard Height Stack (e.g., typical chamber)

B2 - Retention Tested or Untested/Minimum Stack (e.g., "Butler" with short stack)

B3 - Retention Tested or Untested/No Stack (e.g., tarp fumigation)

## Buffer Zones

The amount of time a person spends in areas around commodity fumigations must be limited in order to minimize exposure. Exposure is limited by restricting a person's access to or time spent in areas near enclosures being fumigated or aerated. The size of the buffer zones depends on which of the six types of enclosures is being used. For certain types of enclosures, the amount of sulfuryl fluoride used and retained in the enclosure also influences the size of the buffer zone. There are two types of buffer zones: treatment zone and aeration zone. There can be different sizes of treatment zones because of differences in exposure duration. For example, nearby workers would have a smaller treatment zone if they worked for 12 hours, compared to nearby residents who would have a treatment zone based on a 24-hour exposure. A summary of the treatment zones and aeration zones for the various types of fumigations appears in Chart 1.

**Enclosure Description**

A pressure tested/standard height enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

*Examples: a quarantine chamber with a tall stack; a vacuum chamber with a tall stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration During Daylight**

Does not apply. Aeration may occur at any time.

**Enclosure Description**

A pressure tested/minimum stack enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.

*Examples: a quarantine chamber with a short stack; a vacuum chamber with a short stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 3, page C-97, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

**Enclosure Description**

A pressure tested/no stack enclosure is a vacuum chamber or has passed the USDA pressure test, and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.

*Example: a quarantine chamber with no stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 4, page C-98, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack Exhaust**

Does not apply.

**22: Aeration During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

## Enclosure Description

A retention tested or untested/standard height stack enclosure may retain a large or small proportion of the Sulfuryl Fluoride and the exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any building within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.
**Note**: The size of the treatment zone may be minimized by measuring how well the enclosure fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical chamber with a tall stack, a "Butler" tank with a tall stack, a building with a tall stack.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

## 22: Aeration During Daylight

Does not apply. Aeration may occur at any time.

## Enclosure Description

A retention tested or untested/minimum stack enclosure may retain a large or small proportion of the fumigant. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.
**Note**: The size of the treatment zone may be minimized by measuring how well the enclosure retains fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a chamber with a short stack, a building exhausted through the roof.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone as specified in Table 3, page C-97, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

## 22: Aeration During Daylight

Aeration must be initiated during daylight hours (see permit condition 13).

## Enclosure Description

A retention tested or untested/no stack enclosure may retain a large or small proportion of the fumigant and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.
**Note**: The size of the buffer zones may be minimized by measuring how well the enclosure retains fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical sea/land containe, a building exhausted through open doors and windows, a typical tarpaulin fumigation.*

## 19: Treatment Zone

A treatment zone as specified in Table 2, page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

## 20: Aeration Zone

An aeration zone as specified in Table 4, page C-98, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

## 21: Vertical Stack Exhaust

Does not apply.

## 22: Aeration During Daylight

Aeration must be initiated during daylight hours (see permit condition 13).

## RECOMMENDED PERMIT CONDITIONS

**Sulfuryl Fluoride**
**Commodity Fumigation**

**CHART 1**
Summary of Buffer Zone Sizes

| Retention Category | Aeration Method | Class | Treatment Zone Size | Aeration Zone Size | Aerate Daylight Hours Only |
|---|---|---|---|---|---|
| Pressure Tested *(USDA pressure test)* | Standard Height Stack *(Table 1 requirements)** | A1 | 10 feet | 10 feet | NO |
| | Minimum Stack *(stack 15 ft above ground & exit velocity >600 ft/min)* | A2 | 10 feet | Table 3 | YES |
| | No Stack | A3 | 10 feet | Table 4 | YES |
| Retention Tested or Untested *(DPR-approved test or no test)* | Standard Height Stack *(Table 1 requirements)** | B1 | Table 2 | 10 feet | NO |
| | Minimum Stack *(stack 15 ft above ground & exit velocity >600 ft/min)* | B2 | Table 2 | Table 3 | YES |
| | No Stack | B3 | Table 2 | Table 4 | YES |

* The stack must be at least 10 feet above the enclosure's highest point and at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

# RECOMMENDED PERMIT CONDITIONS

**Sulfuryl Fluoride**
**Commodity Fumigation**

**TABLE 1**
Standard Height Exhaust Stack

This table is used to determine the "standard height" (feet) of a stack. A "standard height" exhaust stack is one which is:

1. at least 10 feet above the enclosure's highest point, and
2. at least 10 feet above any major obstruction within 200 feet of the stack, and
3. at least as tall (above ground level) as the appropriate value in the table below

Total Amount of Sulfuryl Fluoride Applied (pounds) at the Work Site in a 24-hour Period - **ROUND UP**

| | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 600 | 21 | 23 | 26 | 28 | 30 | 32 | 34 | 37 | 39 | 41 | 43 | 45 | 48 | 50 | 52 | 54 | 57 | 59 | 61 | 63 |
| | 700 | 19 | 21 | 23 | 25 | 28 | 30 | 32 | 34 | 36 | 39 | 41 | 43 | 45 | 47 | 50 | 52 | 54 | 56 | 58 | 61 |
| | 800 | 16 | 18 | 21 | 23 | 25 | 27 | 30 | 32 | 34 | 36 | 38 | 41 | 43 | 45 | 47 | 49 | 52 | 54 | 56 | 58 |
| | 900 | 15 | 16 | 18 | 20 | 23 | 25 | 27 | 29 | 31 | 34 | 36 | 38 | 40 | 43 | 45 | 47 | 49 | 51 | 54 | 56 |
| | 1000 | 15 | 15 | 16 | 18 | 20 | 22 | 25 | 27 | 29 | 31 | 33 | 36 | 38 | 40 | 42 | 45 | 47 | 49 | 51 | 53 |
| | 1100 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 29 | 31 | 33 | 35 | 38 | 40 | 42 | 44 | 46 | 49 | 51 |
| Exit | 1200 | 15 | 15 | 15 | 15 | 15 | 18 | 20 | 22 | 24 | 26 | 29 | 31 | 33 | 35 | 37 | 40 | 42 | 44 | 46 | 48 |
| Velocity | 1300 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 22 | 24 | 26 | 28 | 31 | 33 | 35 | 37 | 39 | 42 | 44 | 46 |
| (feet per | 1400 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 24 | 26 | 28 | 30 | 32 | 35 | 37 | 39 | 41 | 44 |
| minute)* | 1500 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 23 | 26 | 28 | 30 | 32 | 34 | 37 | 39 | 41 |
| **ROUND** | 1600 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 | 23 | 25 | 28 | 30 | 32 | 34 | 36 | 39 |
| **DOWN** | 1700 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 19 | 21 | 23 | 25 | 27 | 30 | 32 | 34 | 36 |
| | 1800 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 23 | 25 | 27 | 29 | 32 | 34 |
| | 1900 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 25 | 27 | 29 | 31 |
| | 2000 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 29 |
| | 2100 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 18 | 20 | 22 | 24 | 26 |
| | 2200 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 20 | 22 | 24 |
| | 2300 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 | 21 |
| | 2400 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 19 |
| | 2500 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 |

$$\text{*Exit Velocity} = \frac{\text{Rated Fan Capacity (cubic feet per minute)}}{\text{Stack Cross-Sectional Area (square feet)}}$$

area of circle = $3.14 \times \text{radius}^2$

**TABLE 2**
Treatment Zone Sizes for
Retention Tested and Untested Enclosures

This table is used to determine the treatment zone size (feet) surrounding enclosures which are retention tested or untested. Consult with the CAC to determine the sizes for multiple fumigations in a 24-hour period.

Concentration Lost (pounds per 1000 cubic feet)* ROUND UP

| Volume Fumigated in a 24-hour Period (cubic feet) ROUND UP | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 2000 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 3000 | 30 | 30 | 30 | 30 | 30 | 30 | 35 | 40 | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| 4000 | 30 | 30 | 30 | 30 | 30 | 40 | 50 | 55 | 65 | 70 | 80 | 85 | 90 | 95 | 100 |
| 6000 | 30 | 30 | 30 | 35 | 50 | 60 | 70 | 80 | 90 | 95 | 105 | 110 | 120 | 125 | 130 |
| 8000 | 30 | 30 | 30 | 50 | 65 | 80 | 90 | 100 | 110 | 120 | 125 | 135 | 140 | 150 | 155 |
| 10000 | 30 | 30 | 45 | 65 | 85 | 100 | 115 | 125 | 135 | 145 | 160 | 165 | 175 | 185 | 195 |
| 15000 | 30 | 30 | 60 | 80 | 100 | 120 | 130 | 145 | 160 | 170 | 180 | 190 | 200 | 210 | 220 |
| 20000 | 30 | 40 | 70 | 95 | 115 | 135 | 150 | 170 | 180 | 195 | 205 | 220 | 230 | 240 | 250 |
| 25000 | 30 | 45 | 80 | 105 | 130 | 150 | 170 | 185 | 200 | 215 | 230 | 240 | 255 | 265 | 275 |
| 30000 | 30 | 55 | 90 | 120 | 145 | 165 | 185 | 205 | 220 | 235 | 250 | 265 | 280 | 290 | 305 |
| 35000 | 30 | 60 | 100 | 130 | 160 | 180 | 200 | 225 | 240 | 255 | 275 | 290 | 300 | 315 | 330 |
| 40000 | 30 | 65 | 110 | 145 | 175 | 200 | 220 | 240 | 260 | 280 | 295 | 310 | 325 | 340 | 355 |
| 45000 | 30 | 75 | 120 | 155 | 185 | 210 | 235 | 260 | 280 | 295 | 315 | 335 | 350 | 365 | 380 |
| 50000 | 35 | 80 | 130 | 165 | 200 | 230 | 250 | 275 | 300 | 320 | 340 | 355 | 370 | 390 | 405 |
| 60000 | 40 | 95 | 145 | 185 | 225 | 255 | 285 | 310 | 335 | 355 | 380 | 400 | 420 | 440 | 455 |
| 70000 | 45 | 105 | 165 | 210 | 250 | 285 | 315 | 345 | 370 | 395 | 420 | 440 | 460 | 485 | 505 |
| 80000 | 50 | 115 | 180 | 225 | 270 | 305 | 340 | 375 | 400 | 425 | 455 | 480 | 500 | 525 | 545 |
| 90000 | 55 | 125 | 190 | 240 | 290 | 330 | 365 | 400 | 430 | 455 | 485 | 510 | 535 | 560 | 585 |
| 100000 | 60 | 135 | 205 | 260 | 310 | 355 | 390 | 430 | 460 | 490 | 525 | 550 | 575 | 605 | 625 |
| 110000 | 65 | 145 | 220 | 280 | 335 | 380 | 420 | 460 | 490 | 525 | 560 | 585 | 615 | 645 | 670 |
| 120000 | 70 | 155 | 235 | 295 | 350 | 400 | 440 | 485 | 520 | 555 | 590 | 620 | 650 | 680 | 705 |
| 130000 | 75 | 165 | 245 | 310 | 370 | 420 | 465 | 510 | 545 | 580 | 620 | 650 | 680 | 715 | 740 |
| 140000 | 80 | 175 | 260 | 325 | 390 | 440 | 485 | 535 | 570 | 610 | 650 | 680 | 715 | 745 | 775 |
| 150000 | 85 | 180 | 270 | 340 | 405 | 460 | 505 | 555 | 595 | 635 | 675 | 710 | 745 | 780 | 810 |
| 170000 | 90 | 195 | 295 | 370 | 435 | 495 | 545 | 600 | 640 | 685 | 730 | 765 | 800 | 840 | 870 |
| 190000 | 95 | 210 | 315 | 390 | 465 | 530 | 580 | 640 | 685 | 730 | 775 | 815 | 850 | 895 | 930 |
| 210000 | 100 | 225 | 330 | 415 | 490 | 560 | 615 | 675 | 725 | 770 | 820 | 860 | 900 | 945 | 980 |
| 230000 | 105 | 235 | 350 | 435 | 515 | 585 | 645 | 710 | 760 | 810 | 860 | 905 | 945 | 990 | 1030 |
| 250000 | 110 | 250 | 365 | 455 | 540 | 615 | 675 | 740 | 795 | 845 | 900 | 945 | 990 | 1035 | 1075 |

* The Concentration Lost is calculated from the application rate, exposure duration, and loss ratio (proportion of fumigant leaked from the enclosure), according to the formula below. The exposure duration for workers is 12 hours or the treatment duration, whichever is less. The exposure duration for residents is the duration of treatment (24 hours maximum). The loss ratio is determined from a DPR approved test; for untested enclosures use **0.030**.

Concentration Lost = [Application Rate (pounds per 1000 cubic feet)] × [Exposure Duration (hours)] × [Loss Ratio]

**TABLE 3**
Aeration Zone Sizes for Minimum Stacks

This table is used to determine the aeration zone size (feet) required **during the aeration** of enclosures with exhaust stacks having the following characteristics:

1. The top of the exhaust stack is at least 15 feet above ground level, and
2. The exit velocity is at least 600 feet per minute

$$\text{Exit Velocity} = \frac{\text{Rated Fan Capacity (cubic feet per minute)}}{\text{Stack Cross-Sectional Area (square feet)}}$$

| Total Retained in a 24-hour Period (pounds)* | Aeration Zone (feet) |
|---|---|
| 50 | 10 |
| 51 | 220 |
| ROUND UP 100 | 220 |
| 150 | 360 |
| 200 | 490 |
| 250 | 610 |
| 300 | 720 |
| 350 | 820 |
| 400 | 920 |
| 450 | 1000 |
| 500 | 1090 |
| 550 | 1170 |
| 600 | 1250 |
| 650 | 1320 |
| 700 | 1390 |
| 750 | 1460 |
| 800 | 1530 |
| 850 | 1600 |
| 900 | 1670 |
| 950 | 1730 |
| 1000 | 1790 |

* The Total Retained is calculated from the amount of fumigant, treatment duration and loss ratio (proportion of fumigant leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

Proportion Retained** = 1 – [Treatment Duration (hours) × Loss Ratio]
**For untested enclosures, use **0.90** for the Proportion Retained

Total Retained = [Amount of fumigant Applied in a 24 hour Period (pounds)] × [Proportion Retained]

**TABLE 4**
Aeration Zone Sizes for No Stacks

This table is used to determine the aeration zone size (feet) of enclosures that have no stack. Consult with the CAC to determine the aeration zone size when aerating multiple enclosures in a 24-hour period.

Concentration Retained (pounds per 1000 cubic feet)* ROUND UP

| Volume Aerated in a 24-hour Period (cubic feet) ROUND UP | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 | 2.4 | 2.8 | 3.2 | 3.6 | 4.0 | 4.4 | 4.8 | 5.2 | 5.6 | 6.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 30 | 30 | 30 | 30 | 30 | 30 | 40 | 50 | 60 | 70 | 75 | 85 | 90 | 95 | 105 |
| 2000 | 30 | 30 | 30 | 40 | 60 | 75 | 90 | 100 | 115 | 125 | 135 | 145 | 155 | 160 | 170 |
| 3000 | 30 | 30 | 45 | 70 | 90 | 110 | 125 | 140 | 155 | 165 | 180 | 190 | 200 | 210 | 220 |
| 4000 | 30 | 30 | 65 | 95 | 115 | 135 | 155 | 170 | 185 | 200 | 215 | 225 | 240 | 250 | 260 |
| 6000 | 30 | 55 | 100 | 130 | 160 | 180 | 205 | 225 | 240 | 260 | 275 | 290 | 305 | 320 | 335 |
| 8000 | 35 | 80 | 125 | 165 | 195 | 220 | 245 | 265 | 290 | 305 | 325 | 345 | 360 | 375 | 390 |
| 10000 | 50 | 105 | 155 | 195 | 225 | 255 | 285 | 310 | 330 | 350 | 375 | 390 | 410 | 430 | 445 |
| 15000 | 65 | 140 | 200 | 250 | 290 | 330 | 360 | 395 | 420 | 450 | 475 | 500 | 525 | 545 | 565 |
| 20000 | 80 | 175 | 240 | 300 | 345 | 390 | 425 | 460 | 495 | 525 | 560 | 585 | 615 | 640 | 665 |
| 25000 | 95 | 200 | 275 | 340 | 390 | 440 | 480 | 520 | 560 | 595 | 630 | 660 | 695 | 725 | 750 |
| 30000 | 110 | 225 | 305 | 375 | 430 | 485 | 530 | 575 | 615 | 655 | 695 | 730 | 765 | 795 | 830 |
| 35000 | 125 | 245 | 335 | 410 | 470 | 525 | 575 | 625 | 670 | 710 | 750 | 790 | 830 | 865 | 900 |
| 40000 | 135 | 265 | 360 | 440 | 505 | 565 | 620 | 670 | 720 | 765 | 810 | 850 | 890 | 930 | 965 |
| 45000 | 145 | 285 | 385 | 470 | 540 | 600 | 660 | 715 | 765 | 815 | 860 | 905 | 945 | 990 | 1030 |
| 50000 | 160 | 305 | 410 | 495 | 570 | 635 | 700 | 755 | 810 | 860 | 910 | 955 | 1000 | 1045 | 1090 |
| 60000 | 180 | 340 | 455 | 550 | 630 | 705 | 770 | 835 | 895 | 950 | 1005 | 1060 | 1110 | 1155 | 1205 |
| 70000 | 200 | 370 | 495 | 600 | 685 | 765 | 840 | 910 | 975 | 1035 | 1095 | 1150 | 1205 | 1260 | 1315 |
| 80000 | 220 | 400 | 535 | 645 | 740 | 830 | 905 | 980 | 1050 | 1120 | 1180 | 1245 | 1305 | 1360 | 1420 |
| 90000 | 235 | 430 | 575 | 690 | 795 | 885 | 970 | 1050 | 1125 | 1195 | 1265 | 1330 | 1395 | 1460 | 1520 |
| 100000 | 255 | 460 | 615 | 735 | 845 | 945 | 1035 | 1120 | 1200 | 1275 | 1350 | 1420 | 1485 | 1555 | 1620 |
| 110000 | 270 | 490 | 650 | 780 | 895 | 1000 | 1095 | 1185 | 1270 | 1350 | 1425 | 1500 | 1575 | 1645 | 1710 |
| 120000 | 285 | 515 | 685 | 820 | 945 | 1050 | 1155 | 1245 | 1335 | 1420 | 1505 | 1580 | 1660 | 1730 | 1805 |
| 130000 | 300 | 545 | 720 | 865 | 990 | 1105 | 1210 | 1310 | 1400 | 1490 | 1575 | 1660 | 1740 | 1820 | 1895 |
| 140000 | 315 | 570 | 750 | 905 | 1035 | 1155 | 1265 | 1370 | 1465 | 1560 | 1650 | 1735 | 1820 | 1900 | 1980 |
| 150000 | 330 | 595 | 785 | 945 | 1080 | 1205 | 1320 | 1425 | 1530 | 1625 | 1720 | 1810 | 1895 | 1980 | 2065 |
| 170000 | 360 | 640 | 845 | 1015 | 1160 | 1295 | 1420 | 1535 | 1640 | 1745 | 1845 | 1940 | 2035 | 2125 | 2215 |
| 190000 | 385 | 685 | 905 | 1080 | 1240 | 1380 | 1510 | 1630 | 1745 | 1855 | 1960 | 2065 | 2165 | 2260 | 2355 |
| 210000 | 410 | 725 | 955 | 1140 | 1305 | 1450 | 1590 | 1715 | 1835 | 1950 | 2060 | 2165 | 2270 | 2370 | 2470 |
| 230000 | 430 | 760 | 995 | 1190 | 1360 | 1515 | 1655 | 1785 | 1910 | 2030 | 2140 | 2250 | 2355 | 2460 | 2560 |
| 250000 | 450 | 785 | 1030 | 1230 | 1405 | 1560 | 1705 | 1840 | 1965 | 2085 | 2200 | 2315 | 2420 | 2525 | 2625 |

* The Concentration Retained is calculated from the rate, treatment duration, and loss ratio (proportion of fumigant leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

Proportion Retained** = 1 – [Treatment Duration (hours) × Loss Ratio]
**For untested enclosures, use **0.90** for the Proportion Retained

Concentration Retained = [Application Rate (pounds per 1000 cubic feet)] × [Proportion Retained]

# FINAL PERMIT CONDITIONS

**Sulfuryl Fluoride**
**Commodity Fumigation**

**GENERAL INFORMATION**

**Fumigation Site**: _____ Permit Number: _____

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone: _____
(Facility Operator, Grower, QAC, QAL, etc.)

**Pest Control Business**: _____ Permit Number: _____

Address: _____ City: _____ Zip: _____

Contact Person: _____ Phone: _____
(QAL with the appropriate category)

I VERIFY THAT THE ATTACHED PERMIT CONDITIONS WILL BE FOLLOWED

Permit Applicant: _____ Date: _____
(Facility Operator)

## 1: Maximum Application Rate

Work Site Plan B.1

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*See page C-87 for possible additional restrictions to comply with the buffer zones.*

## 2: Total Sulfuryl Fluoride

Work Site Plan B.2

The total amount of sulfuryl fluoride per work site must not exceed 1000 pounds in a 24-hour period.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*See page C-87 for possible additional restrictions to comply with the buffer zones.*

## 3: Other Types of Applications

Work Site Plan B.3

This permit condition does not apply to sulfuryl fluoride fumigations.

## 4: Enclosed Area and Common Walls

Work Site Plan B.4 & 5

The following types of fumigations are prohibited:

- those inside an enclosed area with people present
- enclosures which share a common wall with another enclosed area with people present

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

| | |
|---|---|
| **5: Outside Introduction** | Application from outside the enclosure through a closed system is required. Releasing sulfuryl fluoride from inside the enclosure is prohibited. |
| Work Site Plan B.6 | ☐ Complies<br>☐ Does Not Apply<br>☐ Alternative: _____ |
| **6: Gas-tight Fumigant Lines** | All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment. |
| Work Site Plan B.7 | ☐ Complies<br>☐ Does Not Apply<br>☐ Alternative: _____ |
| **7: Test Equipment Seals** | The enclosure must be sealed where instrument sampling lines pass through enclosure walls. |
| Work Site Plan B.8 | ☐ Complies<br>☐ Does Not Apply<br>☐ Alternative: _____ |
| **8: Test Equipment Exhaust** | Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure. |
| Work Site Plan B.9 | ☐ Complies<br>☐ Does Not Apply<br>☐ Alternative: _____ |

## 9: Fumigant Line Purge

When introducing sulfuryl fluoride from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

Work Site Plan B.10

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 10: Control Room Ventilation

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

Work Site Plan B.11

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 11: Control Room Storage

Sulfuryl fluoride cylinders must not be stored inside enclosed control rooms.

Work Site Plan B.12

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 12: Aeration Initiation

Work Site Plan B.13

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA).
Exception: Enclosures for which aeration is initiated remotely, such as chambers.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 13: Aeration During Daylight

Work Site Plan D.3

Aeration must be initiated during daylight hours.
Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 14: Minimum Aeration Times

Work Site Plan B.14 & B.15

Enclosures must be aerated for the following minimum duration:
a. 4 hours if mechanically ventilated using fans, or
b. 12 hours if passively ventilated

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 15: Testing Aeration Completeness

Work Site Plan B.16

The concentration of sulfuryl fluoride in the air spaces between the stacked commodity must be less than 1 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 16: Enclosed Storage Areas

Work Site Plan
B.17 & B.18

Sulfuryl fluoride concentrations in enclosed areas (i.e., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 1 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 17: Work Site Plan

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

## 18: Test Results Documentation

Work Site Plan B.19

The enclosure operator must keep records of all test results for 2 years and make them available to the County Agricultural Commissioner and workers upon request.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

*This part needs to be completed for each enclosure.*

## Enclosure Identification/Description: _____

(check one)

Work Site Plan C.1 - 11

☐ A1 - Pressure Tested/Standard Height Stack
☐ A2 - Pressure Tested/Minimum Stack
☐ A3 - Pressure Tested/No Stack
☐ B1 - Retention Tested or Untested/Standard Height Stack
☐ B2 - Retention Tested or Untested/Minimum Stack
☐ B3 - Retention Tested or Untested/No Stack

## Ancillary Buffer Zone Requirements:

Maximum Application Rate: _____

Maximum Fumigated Volume: _____

Treatment Duration: _____

Other Enclosures Which May Be Used Within 24 hrs: _____

### 19: Treatment Zone

Work Site Plan C.12 - 20

A treatment zone of _____ feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. A separate treatment zone of _____ feet for workers may be used.

### 20: Aeration Zone

Work Site Plan C.12 - 20

An aeration zone of _____ feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm.

### 21: Vertical Stack Exhaust

Work Site Plan D.1, D.2

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

☐ Complies
☐ Does Not Apply
☐ Alternative: _____

# Section C.7

# Soil Fumigation

**Introduction**

This section provides information on soil fumigants.

Information on Commodity Fumigation is located in Section C.6

**In this section**

This section contains the following topics.


| Subsection / Topic | See Page… |
|---|---|
| C.7.1—1,3-Dichloropropene | C-107 |
| C.7.2—Metam-Sodium and Metam-Potassium | C-116 |
| C.7.3—Methyl Bromide<br>• 7.3.1—Soil Fumigation Within A Greenhouse | C-123 |
| C.7.4--Approved Alternatives<br>• 7.4.1—Nighttime Applications of Metam-Sodium<br>• 7.4.2—Drench Application Method of Metam-Potassium or Metam-Sodium<br>• 7.4.3—Metam-Potassium and Metam-Sodium Sprinkler 4:00 a.m. Start Method | C-139 |

# Subsection C.7.1

# 1,3-Dichloropropene Pesticides (Fumigant) Recommended Permit Conditions

## Overview

**Introduction**

These recommended permit conditions apply to the use of pesticides containing the active ingredient (a.i.) *1,3-Dichloropropene* (1,3-D) when applied by either mechanical soil injection or drip application systems. They should be used in addition to the provisions in the *California Food and Agricultural Code* (FAC), *Title 3, California Code of Regulations* (3 CCR), and product labeling.

**When requirements differ, the most stringent requirements should be followed.**

**In this document**

This document contains the following topics:


| Part / Topic | See Page… |
|---|---|
| 7.1.1—Use Limitations | C-108 |
| 7.1.2—Conditions for All Application Methods | C-110 |
| 7.1.3—Mechanical Soil Injection | C-111 |
| 7.1.4—Drip Application Systems | C-115 |


*Continued on next page*

# Part 7.1.1

## Use Limitations

**Greenhouses and other enclosed areas**

Currently, all but two of the 1,3-D products actively registered with the Department of Pesticide Regulation (DPR) have labeling that expressly prohibit its use in greenhouses and other enclosed areas. The other two products have labeling instructions that are inconsistent with use in greenhouses or in enclosed areas, and therefore, preclude their use in such areas. Because of this, DPR has determined that the use of 1,3-D in these locations would be in conflict with their labeling and is prohibited.

**How a request to use 1,3-D is processed**

Each request to use 1,3-D must be approved using the following process:

1. A registrant-authorized pest control adviser electronically submits a recommendation for 1,3-D use to the registrant's agent for approval.
2. The registrant's agent electronically checks the recommendation for accuracy against the product labeling and DPR-recommended permit conditions.
3. The registrant's agent validates the calculation of adjusted pounds of 1,3-D requested, taking into consideration all application factors described by the permit.
4. The registrant's agent checks the request against the available pounds within the township allotment. If the amount requested is available, the recommendation is accepted and a Notice of Intent (NOI) can be filed with the county agricultural commissioner (CAC). If there is not enough 1,3-D available, a note is displayed, identifying available ATP of 1,3-D and allowing a modified request for available material.
5. When use in any township exceeds the authorized cap for that township, both DPR and the CAC will receive an informal notification from the registrant or registrant's agent.
6. For any township that reaches 135,375 ATP, the registrant will compare the registrant's agent's records to county records as a quality assurance check.

**Township caps**

The management of chronic exposure through a township limit (cap) is a condition of registration. The 1,3-D registrants (registrants or the registrant's agent) will be responsible for tracking, reporting, and ensuring township caps are observed.

*Continued on next page*

**Township caps** (continued)

An annual township (36 square-mile area) cap is necessary to minimize the levels of the amount of 1,3-D in the atmosphere and mitigate the potential for chronic exposure. This township cap is based on the adjusted total pounds (ATP) of 1,3-D used, which is calculated using the percentage of a.i. in different 1,3-D products.

DPR is utilizing the guidelines of the California Management Plan: 1,3-Dichloropropene. **For most townships, the current cap is 90,250 ATP per calendar year.**

When county or state borders divide the township, the ATP of 1,3-D allowed per calendar year shall be approximately proportional to the area in each political subdivision.

Prior to each application, the permittee shall consult with the registrant or the registrant's agent to ensure the proposed use does not exceed the ATP of 1,3-D applied in that township within the month or calendar year.

**Exceeding the township cap**

If the need for 1,3-D in a township exceeds the cap, the Director, upon request, may authorize supplemental allowances over the cap provided no significant increase in risk is created by the additional use.

Up to 180,500 ATP per calendar year is authorized, but only to the extent that use since 1995 in that township was under the annual cap. The unused allotment since 1995 will be, in effect, a “bank” that can be drawn upon.

Once the bank of unused allotment has been expended, use in a township must return to the authorized annual cap, unless the Director allows for exceptions.

# Part 7.1.2

## Conditions for All Application Methods

**Notice of Intent (NOI)**

- The permittee shall provide a valid recommendation to the CAC from a registrant-authorized pest control adviser before the NOI is accepted and the application allowed.
- In addition to the information required in 3 CCR section 6434, the following information shall be provided on the NOI:
  1. Application depth and type
  2. The total gallons (TG) of the pesticide formulation
  3. The pounds per gallon (lbs./gal) of 1,3-D formulation
  4. The percent by weight of a.i., expressed as a decimal (.XX)
  5. The total pounds (TP)
  6. The application factor (AF) appropriate for the proposed application
  7. The adjusted total pounds (ATP) for the proposed application

**Buffer zones**

- The buffer zone shall be a minimum of 100 feet measured from the perimeter of the application block to any occupied residences, occupied onsite employee housing, schools, convalescent homes, hospitals, or other similar sites identified by the CAC.
- The buffer zone may extend across roads, highways or similar rights-of-way, or sites approved by the CAC.
- All labeling requirements shall be followed. When the requirements of the product label and these permit conditions differ, the most restrictive shall apply.

**Restricted Entry Interval (REI)**

Entry by any person (including early entry that would otherwise be permitted by the Worker Protection Standard), other than a properly trained and equipped handler who is performing a handling task permitted on the label, is prohibited from the start of the application until seven (7) days after the application.

# Part 7.1.3

## Mechanical Soil Injection

**Determining the application factor (AF)**

The application factor (AF) is a predetermined numerical value based on the month, depth of injection, and geographic location of the specific application. The AF values are used in the formula to determine the ATP used during the application. Use Table 1 below to determine the AF.

**Table 1. Applying the Application Factor (AF)**

| **IF** applying the fumigant… | **AND** applied in the month(s) of… | **AND** at depths of… | **THEN,** use the AF of… |
|---|---|---|---|
| Within the San Joaquin Valley ozone nonattainment area[1]→ | January or December→ | Less than 18 inches→ | (Prohibited) |
| Within the San Joaquin Valley ozone nonattainment area→ | January or December→ | 18 inches or deeper→ | 1.9 |
| | | | |
| Outside the San Joaquin Valley ozone nonattainment area → | January or December→ | Less than 18 inches→ | 2.3 |
| Outside the San Joaquin Valley ozone nonattainment area → | January or December→ | 18 inches or deeper→ | 1.2 |
| | | | |
| Within or Outside the San Joaquin Valley ozone nonattainment area → | February through November→ | Less than 18 inches→ | 1.9 |
| Within or Outside the San Joaquin Valley ozone nonattainment area → | February through November→ | 18 inches or deeper→ | 1.0 |

*Continued on next page*

[1]The San Joaquin Valley ozone nonattainment area, as defined in Title 40, Code of Federal Regulations, Section 81.305, is an eight-county region that consists of Fresno, the western valley portion of Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties.

**Application rates – maximum gallons per acre (M gal/A)**

**To determine the maximum number of gallons per acre of pesticide formulation (M gal/A):**

The gal/A = lbs./A divided by lbs./gal
Divide lbs./A (332) by lbs./gal

- Convert percentage of 1,3-D to a decimal (divide XX% by 100 = .XX);
- To find lbs./gal, multiply lbs./gal x .XX = lbs./gal
- **With or without a tarpaulin**, divide 332 by lbs./gal = gal/A

Because percentages of a.i. differ in various 1,3-D products, the procedures below describe a method to ensure that the maximum rate and township limit is not exceeded. Additionally, this procedure takes into account percentages of 1,3-D a.i. within different formulated products, allowing more gallons per acre (gal/A) when the product has a lower percentage of 1,3-D or less gal/A if the product has a higher percentage of 1,3-D. The formula follows:

1. The gal/A of pesticide formulation shall be based on the number of pounds per acre (lbs./A) of 1,3-D a.i.
   a) The maximum allowable amount of 1,3-D shall be 332 lbs./A a.i.
   b) See pesticide labeling for detailed rate recommendations and rate calculation instructions.

2. Use the following information to calculate the maximum gal/A allowed for each application:
   a) The pounds per gallon (lbs./gal) for the pesticide formulation
   b) The percentage by weight of 1,3-D (XX%) in the pesticide formulation, expressed as a decimal (.XX)
   c) The pounds of 1,3-D per gallon (1,3-D/gal) for the pesticide formulation
   d) The maximum lbs./A for the application (332)

*Continued on next page*

**Maximum application rates**

Use Table 2 below as a shortcut to find the maximum application rate, with or without a tarpaulin. For example, pesticide product labeling states that Pic-Clor 60, Telone™ II, Telone™ C-17, Telone™ C-35, and Tri-Form 35 shall be applied by mechanical soil injection only.

**Table 2. How to determine the maximum application rate with or without a tarpaulin**

| **Calculations** | **Pic-Clor 60** | **Telone™ II** | **Telone™ C-17** | **Telone™ C-35*** | **Tri-Form 35** |
|---|---|---|---|---|---|
| (1) Weight/gallon[1] | 12.1 lbs. | 10.1 lbs. | 10.6 lbs. | 11.2 lbs. | 11.2 lbs. |
| (2) % 1,3-D/gallon[2] | 39% | 97.5% | 78.3% | 61.1% | 63.4% |
| (3) Amt. 1,3-D/gallon[2]<br>(3) = (1) x (2) ÷100 | 4.72 lbs. | 9.85 lbs. | 8.29 lbs. | 6.84 lbs. | 7.1 lbs. |
| | | | | | |
| **Maximum application rate** | | | | | |
| (4) Max. lbs. a.i./Acre[4] | 332 lbs. a.i./A | 332 lbs. a.i./A | 332 lbs. a.i./A | 332 lbs. a.i./A | 332 lbs. a.i./A |
| (5) Max. gal/Acre[5]<br>(5) = (4) ÷ (3) | 70.34 gal/A | 33.70 gal/A | 40.05 gal/A | 48.54 gal/A | 46.76 gal/A |

*Continued on next page*

*** NOTE**: See the **Telone™ C-35** product's label for the active ingredient percentages. There are presently two variations of Telone™ C-35 in the channels of trade -- 61.1% a.i. and 63.4% a.i. Do not exceed the maximum rate described by permit conditions.

[1] Information for steps 1 and 2 can be found on the product label.
[2] Information for step 3 may or may not be on the product label, but can be calculated from steps 1 and 2.
[4] Maximum lbs. a.i./Acre in step 4 has been predetermined by the Department of Pesticide Regulation.
[5] Maximum gal/A in step 5 must be calculated by the applicator.

**Calculating the ATP**

The ATP for each application shall be calculated based on the following:

1. The total gallons (TG) of the pesticide formulation
2. The lbs./gal for the pesticide formulation
3. The percent by weight (XX%) of 1,3-D in the pesticide formulation, expressed as a decimal (.XX)*
4. The total pounds (TP) of 1,3-D**
5. The application factor (AF) as determined from Table 1.

The ATP for each application shall be calculated using the following formula:

TG x lbs./gal x (.XX) x AF = ATP.

*To convert the 1,3-D percentage by weight (XX%) to a decimal, divide XX% by 100 = .XX
**To find the TP, multiply, TG x lbs./gal x (.XX) = TP

- To find the ATP, multiply, TP x AF = ATP

# Part 7.1.4

## Drip Application Systems

**Application timing and corresponding application factor**

Drip irrigation applications on soil surface or buried drip application shall use an application factor (AF) of 1.16, regardless of depth.

Application Time and area

- Generally, applications are allowed statewide during the entire year, however, applications shall not occur in the San Joaquin Valley ozone nonattainment area during January and December of each calendar year.

**Calculating the ATP**

The adjusted total pounds (ATP) for each application shall be calculated based on the following:

1. The total gallons (TG) of the pesticide formulation
2. The pounds per gallon (lbs./gal) for the pesticide formulation
3. The percent by weight (XX%) of 1,3-D in the pesticide formulation, expressed as a decimal (.XX)*
4. The total pounds (TP) of 1,3-D**
5. The application factor (AF) (1.16 AF)

The ATP for each application shall be calculated using the following formula:

TG x lbs./gal x (.XX) x 1.16 AF

*To convert 1,3-D percentage by weight (XX%) to a decimal, divide XX% by 100 = .XX
**To find the TP, multiply, TG x lbs./gal x (.XX) = TP

- To find the ATP, multiply, TP x 1.16 AF = ATP

# Subsection C.7.2

# Recommended Permit Conditions for Metam-Sodium and Metam-Potassium Products

## Overview

**Introduction**

This document provides the recommended permit conditions for applications of metam-sodium and metam-potassium products.

**Notes**

- The county agricultural commissioner (CAC) may increase the buffer zone based upon their site evaluation. However, the buffer zone shall not be decreased near sensitive sites.
- The Department of Pesticide Regulation will address drip applications; granular formulations of methyl isothiocyanate (MITC)-generating products; and metam-sodium and metam-potassium training at a later date.
- *Italicized* text indicates the final determinations are pending an ongoing evaluation.
- If the air temperature is expected to exceed 100ºF, DPR recommends the following procedures to CACs:
  1. Conduct a preapplication site evaluation prior to the metam-sodium application.
  2. Preapplication site evaluations should occur as close to the intended date of application as possible. Contact applicators to determine the exact application time to facilitate preapplication site inspections.
  3. Based on resources, CACs should give priority to sensitive areas first, followed by other remaining sites, when possible.
  4. The preapplication site evaluation shall ensure that the site has an irrigation system readily available with the capability to cover the entire application site. The acres applied per day by shank injection near sensitive areas should not exceed the capacity of the available water delivery system to apply a minimum of ¼-inch per hour of water concurrently to the entire surface applied on that day.
  5. The CAC should take and record soil moisture readings and soil temperature readings to three inches.

*Continued on next page*

**Attachments**

The information is outlined in topic sections as follows:


| Part / Topic | See Page… |
|---|---|
| 7.2.1—All Application Blocks | C-118 |
| 7.2.2—Specific Applications Blocks Near Sensitive Sites | C-120 |

# Part 7.2.1

## All Application Blocks

**Application blocks**

The permit conditions in Part 7.2.1 apply to all application blocks. See Part 7.2.2, Specific Application Blocks, for specific application information.

**Scope**

The CAC specifies the applicable conditions, based on an evaluation of the proposed use of metam. Implementation of the conditions "near" sensitive sites beyond the buffer zone may be applied, based upon the CAC's determination of the level of sensitivity of the particular site in question.

When metam is applied by a licensed pest control business (PCB), the permittee shall provide a copy of the permit conditions to the PCB prior to the application. The PCB shall comply with all application requirements.

The permittee shall be responsible for ensuring compliance with permit conditions specified by the CAC.

Users shall comply with the provisions of the Food and Agricultural Code and Title 3 of the California Code of Regulations, the product label including the Technical Information Bulletin (TIB), and permit conditions. **Where requirements differ, users shall always follow the more restrictive conditions.**

**All applications**

- Climatic conditions, including the absence of an "inversion," shall be suitable for commencement and continuation of each application.
- Whenever irrigation equipment is required, the equipment shall be in place prior to the commencement of the application.
- Whenever irrigation equipment is required and mitigation of off-site movement is necessary, a minimum of ½-inch of water shall be applied, started immediately and completed within four hours.
- Water delivery system capacity shall meet or exceed the specifications of the TIB, product label, and permit conditions.

*Continued on next page*

**Definitions**

**Application block**: means a field or portion of a field treated in a 24-hour period that is typically identified by visible indicators, maps, or other means.

**Applicator**: the person or firm that physically makes the application. Includes growers and pest control businesses.

**Irrigating**: means applying additional water to the application block. (Previously referred to as **water-sealing, water-capping, or water-layering**.)

**Monitoring**: shall consist of a thorough inspection of the entire treatment area.

**Sensitive site**: is designated based on an evaluation by the commissioner. The term "sensitive site" as used in these permit conditions is based on highly sensitive populations or populated areas such as schools, churches, and day care centers. As such, all mitigation measures may not be necessary, depending upon the nature of the "sensitive site."

*Continued on next page*

# Part 7.2.2

## Specific Application Blocks Near Sensitive Sites

**Application blocks**

The conditions in Part 7.2.2 apply to specific application blocks. Please refer to Part 7.2.1, All Application Blocks, for additional application information.

**Field monitoring near sensitive sites**

Field monitoring shall be conducted on an hourly basis during the application and a record of the following application information maintained *when applied within 1,500 feet of an occupied structure*:

- Date of application
- Date and time of the field monitoring
- Wind speed
- Wind direction
- Temperature (air and soil)
- Odor (yes or no)
- Application start and stop time
- Method of application
- Grower's name
- Permit number
- Field location/site number
- Number of acres treated
- Soil moisture (% field capacity)
- In addition to the above requirements, additional requirements for sprinkler applications are shown below:
    - Irrigation set number
    - Irrigation rate (inch/hour)
    - Water pressure (psi)
    - Nozzle size

*Continued on next page*

**Post-application field monitoring near sensitive sites**

Post-application field monitoring shall be conducted every two hours for a minimum of 12 hours after the application has ceased. Post-application monitoring includes documentation of the following information *when applied within 1,500 feet of an occupied structure*:

- Date and time of field monitoring
- Observations (changes in weather conditions, etc.)
- Odor (yes or no)
- Irrigation, when required, including the date, time, comments or observations, and the amount of water (inches).

Each field monitoring and post-application monitoring record shall be maintained by the permittee for a minimum of six months or as designated by the CAC.

**Shank injection or rotary tiller applications near sensitive sites**

- A minimum buffer zone of 500 feet shall be required for all applications that exceed 64 pounds of active ingredients per acre. The CAC may increase the buffer zone based upon their site evaluation. However, the buffer zone shall not be decreased.
- When applying to multiple blocks, subsequent applications shall move away from the sensitive site, unless expressly allowed by permit.
- Operational sprinkler irrigation equipment shall be in place whenever the rate exceeds 64 pounds of active ingredients per acre.

Field equipment shall meet the following minimum specifications:

- Dry disconnect fittings (closed system transfer) shall be installed on all tanks and equipment.
- Each tractor saddle tank shall be equipped with a minimum size #50 mesh screen on both the fill and discharge outlets.
- Main line shutoff or by-pass valves shall be used to stop flow to the distribution manifold.
- All systems shall be equipped with an individual shank monitoring system to detect flow problems in each individual shank.
- Dual check valves shall be installed on each outlet between the manifold and as close as possible to the discharge point.
- All components of the delivery system normally below ground shall be metal and suitable for use as provided on the product label.

*Continued on next page*

## Specific Application Blocks Near Sensitive Sites, Continued

**Sprinkler applications near sensitive sites**

- A minimum buffer zone of 500 feet from the sensitive site shall be required. The CAC may increase the buffer zone based upon their site evaluation. However, the buffer zone shall not be decreased.
- When applying to multiple blocks, application blocks shall move away from the sensitive site, unless expressly allowed by permit.
- The product shall be applied evenly over a minimum of 4 hours and in a minimum of .80 inch of water.
- After the application is completed, a minimum of ½-inch of water shall be applied, started immediately and completed within four hours.

**The Busan 1180 label prohibits all sprinkler applications.**

**Flood application near sensitive sites**

Floodwater shall be available during the post application-monitoring period in an amount sufficient to provide at least one inch of water over the application block.

# Subsection C.7.3

# Soil Fumigation (Methyl Bromide) Recommended Permit Conditions

**Introduction**

There are **no** current methyl bromide field soil recommended permit conditions. All applicable requirements have been adopted into 3 CCR sections 6447 through 6447.3.

**Additional information**

The *Guidance Manual--Methyl Bromide (In Combination With Chloropicrin) Field Soil Fumigation* (rev. 12/8/04) provides additional information about applying those regulations. You can view the guidance manual at:

http://www.cdpr.ca.gov/docs/county/training/methbrom/mebrman.pdf

**In this subsection**

This subsection contains the following topics.


| Part / Topic | See Page… |
|---|---|
| 7.3.1—Recommended Permit Conditions for Soil Fumigation Within a Greenhouse | C-124 |

# Part 7.3.1

# Recommended Permit Conditions for Soil Fumigation Within a Greenhouse

## I. DEFINITIONS

A. **Application** includes treatment and aeration; it is complete when each application block has been aerated.

B. **Application block** is the actual area within a greenhouse that will be fumigated in any 24-hour period. The application block cannot exceed 50,000 square feet. The maximum square footage may be reduced due to the distance to an occupied structure, previously fumigation application blocks, future greenhouse fumigations, and adjacent workers.

C. **Application rate**, in pounds/acre, is equal to the amount of methyl bromide (active ingredient) in the formulated product.

D. **Application site** is the treatment area within a greenhouse which may be comprised of more than one application block.

E. **Buffer zone** is the area that must be maintained between the application block and those places where people conduct certain activities or practices. Buffer zones are in effect until the tarp has been removed **and** aeration is complete. For greenhouse soil fumigations, the two types of zones to be considered are:

1. **Resident Buffer Zone** is the area surrounding an application block outside of which people may "dwell." See the definition: **dwell**.

2. **Worker Buffer Zone** is the area surrounding an application block outside of which people may "work or occupy." See the definition: **work or occupy**.

F. The **buffer zone duration** for an application block begins at the start of fumigation and ends 48 hours after the tarpaulin has been removed, when aeration is considered complete. The length of this period depends upon the timing and method of tarp removal.

G. **Dwell** means that a person is able to or will occupy a structure for any or all parts of a 24-hour period. This includes, but is not limited to: homes, hospitals, convalescent homes, boarding schools, day schools, parks, hotels, apartment complexes, and other sensitive areas.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### I. DEFINITIONS (Continued)

H. **Fieldworkers** are those employees who engage in work activities in an application block **after** aeration is complete.

I. **Frequency of applications** refers to the interval of time elapsed from the beginning of the application of methyl bromide at one application block to the beginning of the application of methyl bromide at another application block.

J. An **isolated block** is one that is 1,300 feet or more from another greenhouse soil fumigation **or** at least 48 hours has elapsed, or will elapse, before another greenhouse soil fumigation is conducted.

K. A **non-isolated block** is one that is less than 1,300 feet from another greenhouse soil fumigation **and** less than 48 hours have elapsed, or will elapse, before another greenhouse soil fumigation is conducted.

L. **Pesticide Handler** includes employees involved in fumigation, aeration activities, tarp repair, and tarp removal **prior** to the completion of aeration.

M. **Work or occupy** means that a person is able to or will be at a place for **eight hours or less**. This includes, but is not limited to: fields, offices, warehouses, stores, malls, factories, greenhouses, packing sheds, and workshops

### II. WORKER SAFETY REQUIREMENTS

#### A. Restricted Entry and Warning Sign Posting Requirements

1. As a condition of the permit, warning signs shall be posted around the application block for the duration of the restricted entry interval. Refer to 3 CCR section 6776(b) for the requirements.

2. The restricted entry interval for an application block begins at the start of fumigation and ends when aeration is complete.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### A. Restricted Entry and Warning Sign Posting Requirements (Continued)

3. Aeration is considered complete 48 hours after the tarp has been removed and when the requirements listed in Section VIII, Tarpaulin and Soil Aeration Procedures have been met.

   For example, if the tarp is removed from the application block after three days (the minimum required fumigation time) and the soil is aerated for two days (minimum aeration time), then the restricted entry interval lasts for five days from the start of fumigation.

4. Fieldworkers shall not be allowed to enter an application block to perform cultural activities until the restricted entry interval has elapsed and warning signs have been removed.

5. Title 3 of the California Code of Regulations section 6782(c), covering fumigation of enclosed spaces, requires that warning signs be posted on or near all greenhouse entrances until fumigation and ventilation are complete and the premises are safe for reentering. Refer to section 6782(c) for the warning sign requirements.

### B. Pesticide Handler and Field Worker Requirements

1. The employer must maintain use records for **all** employees involved in application, tarp repair, and tarp removal activities. The record shall identify the person, work activity(ies), date(s), duration of handling, U.S. Environmental Protection Agency Registration Number, and brand name of the methyl bromide product handled.

2. The employer must maintain these use records at a central location for two years and make them available to the county agricultural commissioner upon request for review.

### C. Tarpaulin Repair

1. The decision to conduct tarp repair must be made by a certified applicator (the permittee, the permittee's authorized representative, or the pest control operator) on a job-by-job basis. The decision should be based on, but not limited to, hazard to the public, residents, or workers; size of the damaged area(s); timing of damage; and feasibility of repair.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### C. Tarpaulin Repair (Continued)

2. Title 3, California Code of Regulations section 6780 requires the use of approved respiratory protective equipment if the concentration of methyl bromide cannot be controlled and an employee's exposure would exceed 5 ppm. Areas to be repaired must be tested by the certified applicator, using an appropriate testing device, and shown to have less than 5 ppm of methyl bromide in the projected work areas before unprotected employees are allowed to enter to conduct tarp repair. The certified applicator must wear approved respiratory protective equipment when conducting these tests.

### D. Workers in Adjacent Sites

1. The property operator and/or pest control operator must be aware of adjacent sites where activity is likely while the Worker Buffer Zone is in effect, following the start of the application. They must ensure that the adjacent property operators are advised, **prior to the fumigation**, to keep their workers outside of the Worker Buffer Zone during that period of time.

2. The property operator and/or pest control operator may give notice to adjoining property operators verbally or in writing.

3. If entry occurs as the result of a failure to be aware of worker activity and subsequent failure to advise adjacent property operators to keep workers out, the operator of the property fumigated and the person performing pest control are in violation of the methyl bromide permit conditions.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### III. APPLICATION REQUIREMENTS

A. **Soil injections using tractor-drawn chisels or similar devices are prohibited within a greenhouse.**

B. All soil application of methyl bromide within a greenhouse shall comply with the raised-tarp fumigation methods specified on the registered pesticide label. **All delivery tubes shall be anchored in place under the tarp and shall not be moved during the application of methyl bromide.** Follow the manufacturer's recommendations for application tubing.

C. The fumigant must be introduced from outside of the greenhouse. If entry into the greenhouse enclosure is required to perform a function necessary for the application, a Self-Contained Breathing Apparatus must be worn.

D. All fittings, connections, and valves must be checked for methyl bromide leaks prior to fumigation. If cylinders are replaced during the fumigation process, the connections and valves must be checked for leaks prior to continuing the job.

E. Only the tarpaulins <u>listed on the approved manufacturers list are to be used.</u> (See Section IX, List of Manufacturers of High Barrier Approved Tarpaulins.) They have been determined to meet or exceed the following standards for a "high barrier" tarpaulin: a permeability factor of less than eight millimeters methyl bromide per hour, per square meter, per 1,000 ppm of methyl bromide under the tarpaulin at 30 degrees Celsius. Polyethylene tarp of six-mil thickness or greater meets these criteria.

F. A **maximum of 450 pounds** of methyl bromide (active ingredient) per acre is allowed.

G. A **maximum aggregate of 50,000 square feet** will be allowed in a 48-hour period.

H. All greenhouse fumigations must be isolated from all other types of methyl bromide fumigations.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

## IV. BUFFER ZONE DETERMINATION

A. A buffer zone is the area surrounding an application block **outside** of which certain activities or practices are allowed. The buffer zone is in effect until the tarp has been removed and aeration is complete (See Section VIII, Tarp Removal). The size of the buffer zone will be determined by the proposed size of the application block and the application rate. The buffer zone surrounding an application block may have to be modified due to the proximity to occupied structures, distance to adjacent workers, and nearness to completed or proposed greenhouse fumigations.

B. The buffer zone is partitioned into the Resident Buffer Zone and the Worker Buffer Zone. The size of the Resident Buffer Zone is based on the assumption that a person may "dwell" at a place for any or all parts of a **24 hour-period.** The size of the Worker Buffer Zone is based on the assumption that people work or recreate at a place for **eight hours or less.**

C. Transit through the Worker Buffer Zone by the permittee's employees is limited to infrequent and unavoidable trips. Routine or repeated transit through this buffer zone is prohibited.

D. The buffer zones begin at the edges of the treated piles and extend in all directions regardless of buildings or property boundaries.

E. Procedures: Isolated Blocks

1. To determine the **Resident Buffer Zone** surrounding an isolated block, use the application rate and the area of the application block and apply these values to Table 1.

2. To determine the **Worker Buffer Zone** surrounding an isolated block, first divide the application rate by **three**. Then, using the adjusted application rate and the area of the application block, apply these values to Table 1.

## IV. BUFFER ZONE DETERMINATION (Continued)

F. Procedures: Non-Isolated Blocks

1. Determine the highest application rate for all application blocks within 1,300 feet.

2. Compute the sum of the areas, in square feet, of the block to be evaluated and the next largest block within 1,300 feet.

3. To determine the **Resident Buffer Zone**, use the highest application rate and the sum of the application block areas and apply these values to Table 1.

4. To determine the **Worker Buffer Zone**, divide the highest application rate by **three**. Use the adjusted application rate and the sum of the application block areas and apply these values to Table 1.

5. If there are **only** two non-isolated application blocks, then the buffer zones determined above will be the **same** for each block.

   If there are **more** than two non-isolated blocks, then each pair of blocks, the one under evaluation and the next largest, will have to be considered individually. This may result in each block having different buffer zones even though they are not isolated from the others.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### V. BUFFER ZONE DURATION

A. The Resident and Worker Buffer Zones that surround an application block are in effect *from the start of the fumigation* until aeration is complete. Aeration is considered complete **after** the tarp has been removed **and** 48 hours have elapsed since tarp removal was completed. See Section VIII, Tarp Removal.

   For example: the tarp was removed three days (minimum time allowed) after the fumigation was completed and the block was allowed to aerate for the required 48 hours following tarp removal. The buffer zone would be in effect for five days from the start of fumigation in an application block.

B. Determine the proposed Resident Buffer Zone by measuring the distance between the edge of the application block and the **edge of the property line**, not the physical structure associated with the property. This includes places where people are occupying.

   People are not allowed to "dwell" within the Resident Buffer Zone. Residences within the buffer zone **must** be vacated while the buffer zone is in effect. If the resident(s) cannot or will not vacate the building(s), then the property operator must decrease the acreage to be treated or the rate of methyl bromide to be used so that the building lies outside of the buffer zone.

C. If there is an occupied commercial building or workers within the proposed Worker Buffer Zone and the workers were unable to vacate the premises, then the application must either be rescheduled to coincide with the worker's day off or the acreage/rate must be decreased to reduce the buffer zone.

D. If there is a recreational area within the Worker Buffer Zone where people are expected to spend large amounts of time, the application must be rescheduled or amended to accommodate this activity. If the people are just walking, bicycling, or driving through the area without stopping, the application does not need to be changed.

E. This requirement applies to all persons, including the property operator.

F. If the application is stopped due to weather or breakdowns, then the buffer zone duration starts over at the beginning of the next day's application.

## VI. NOTICE OF INTENT MODIFICATION

A. The county agricultural commissioner must receive a Notice of Intent at least 24 hours prior to commencement of fumigation of any application block with methyl bromide for a greenhouse soil fumigation. The Notice of Intent must indicate the day and the hour the application is intended to commence.

B. Unless a waiver is granted by the county agricultural commissioner, fumigation of any application block must not commence sooner than the starting time indicated on the Notice of Intent. Nor, must the fumigation commence later than 12 hours after the intended starting time submitted with the Notice of Intent. If fumigation of an application block does not commence within this time frame, a new Notice of Intent must be submitted, but no 24-hour waiting period is required unless notified by the county agricultural commissioner.

C. For multiple application blocks to be fumigated sequentially, the county agricultural commissioner may allow a Notice of Intent with a "schedule" to be submitted in lieu of a Notice of Intent for each application block to be fumigated. The schedule must include a map and must specify the date and time each application block is intended to be fumigated.

D. The 24-hour Notice of Intent waiting period may be waived if the county agricultural commissioner determines that effective pest control cannot be attained otherwise, or, 24 hours are not necessary to adequately evaluate the intended application.

E. The reasons for granting each waiver must be documented and a record maintained by the county agricultural commissioner.

F. The operator of the property to be treated and the person performing pest control, if different, must be aware of adjacent sites where there is a reasonable possibility of **work activity** occurring while the **Worker Buffer Zone is in effect**, and must ensure that operators of those adjacent properties are advised to keep fieldworkers out of those areas during that period of time.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

## VII. GREENHOUSE REENTRY REQUIREMENTS

A. If the greenhouse is **not enclosed**, the air monitoring requirements listed in this section may be waived. This determination should be based on the size and number of openings in the greenhouse, length of time the greenhouse will remain open, local wind conditions, the proximity to obstructions, the application rate, and the size of the fumigation. Other parameters may apply according to the specific situation. If only doors and vents are opened (regardless of ventilation), the greenhouse should be considered **enclosed**.

B. Entry by any person, other than a trained and protected pesticide handler into an **enclosed** greenhouse, is **prohibited** from the start of application until 48 hours after application AND the air concentration has been measured and found to be less than 5 ppm in the working area(s).

C. Entry by any person, other than a trained and protected pesticide handler, is **prohibited** for 24 hours following the start of aeration (tarp cutting, tarp removal, breaking seals). **Note**: 3 CCR section 6782(d) **prohibits** the release of a fumigant into an enclosed, occupied work area.

D. Entry into an enclosed greenhouse by unprotected workers, when not prohibited above, will be allowed only after air monitoring is conducted according to the protocol listed in Appendix 1. Work time restrictions will be based on the air monitoring test results. Air monitoring and entry restrictions will continue until aeration is complete.

E. The permittee shall prohibit all work activities within the Worker Buffer Zone surrounding a fumigated application block. The Worker Buffer Zone is in effect until soil aeration is complete. This prohibition shall be in effect for all greenhouse types, whether enclosed or open.

F. If the Worker Buffer Zone extends into adjacent greenhouses, workers may occupy those areas within the adjacent greenhouse that are outside of the Worker Buffer Zone without additional air monitoring or restriction.

G. A Self-Contained Breathing Apparatus shall be worn when entry into an enclosed greenhouse is required during the time periods listed in VII-B and VII-C. A Self-Contained Breathing Apparatus shall be worn when entry into a Worker Buffer Zone and/or the application block is required before aeration is complete regardless of greenhouse type (enclosed or open).

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### VII. GREENHOUSE REENTRY REQUIREMENTS (Continued)

H. If the greenhouse is enclosed, the measured airborne levels of methyl bromide must be less than 1 ppm **and** soil aeration must be complete before unrestricted entry into all areas of the greenhouse is permitted.

   If the greenhouse is not enclosed, then soil aeration must be complete before unrestricted entry is permitted.

### VIII. TARPAULIN REMOVAL AND SOIL AERATION PROCEDURES

A. The tarpaulin must remain on the application block for at least three days (72 hours) following the application.

B. A Self-Contained Breathing Apparatus **shall** be used while the tarpaulin is being removed (without aeration), slit, or while breaking soil-to-tarp or tarp-to-tarp seals.

C. If the tarp is slit or the seals broken, rather than being completely removed, the treated area shall be aerated for a minimum of one day (24 hours) after finishing this activity.

   The tarpaulin may be removed, without using a Self-Contained Breathing Apparatus, only after the aeration period is complete and air monitoring has been done according to the requirements listed in Appendix I. The same limitations listed in Appendix I apply to persons engaged in tarp removal.

D. The soil must remain undisturbed for a minimum of two days (48 hours) after the tarpaulin has been completely removed. When this time period has elapsed and air levels have been tested and shown to be less than 1 ppm methyl bromide (as required in Section VII-H), then the restricted entry interval and buffer zone periods are over.

### IX. LIST OF MANUFACTURERS OF HIGH BARRIER APPROVED TARPAULINS

The current list of approved tarpaulins is available at DPR's web site at:
http://www.cdpr.ca.gov/docs/dprdocs/methbrom/fum_regs.htm

Under the section, **Methyl Bromide**, select **Approved tarpaulins**.

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

### TABLE 1. Buffer Zone Distances (In Feet) for Greenhouse Applications of Methyl Bromide

There are two steps in determining the appropriate size of the Resident and Worker Buffer Zones for an application block. First, determine if the block is isolated or not; refer to the definitions in Section I.

To determine the size of the Resident Buffer Zone, select the appropriate number of square feet in the left-hand column. Then, select the application rate (pounds/acre) from the top row. The Resident Buffer Zone is the value where the square foot row and the rate column intersect. To determine the Worker Buffer Zone, divide the application rate by three and follow the instructions for the Resident Buffer Zone.

| **Area Treated (Round up)** | | **Application Rate: Pounds Per Acre (Round up to next highest value)** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Square feet | Acres | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 425 | 450 |
| 5,000 | 0.11 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 25 | 25 | 30 |
| 10,000 | 0.23 | 20 | 20 | 20 | 25 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 15,000 | 0.34 | 20 | 20 | 25 | 30 | 40 | 50 | 55 | 65 | 70 | 80 | 90 | 95 |
| 20,000 | 0.46 | 20 | 20 | 30 | 40 | 50 | 60 | 75 | 85 | 95 | 105 | 115 | 125 |
| 25,000 | 0.57 | 20 | 25 | 40 | 50 | 60 | 75 | 85 | 100 | 115 | 125 | 140 | 155 |
| 30,000 | 0.69 | 20 | 30 | 45 | 60 | 70 | 85 | 105 | 115 | 135 | 150 | 165 | 180 |
| 35,000 | 0.80 | 20 | 30 | 50 | 65 | 80 | 95 | 115 | 135 | 150 | 165 | 180 | 200 |
| 40,000 | 0.92 | 20 | 35 | 55 | 70 | 90 | 105 | 125 | 145 | 165 | 180 | 200 | 220 |
| 45,000 | 1.03 | 20 | 40 | 60 | 75 | 95 | 115 | 140 | 160 | 180 | 200 | 220 | 240 |
| 50,000 | 1.15 | 25 | 40 | 60 | 85 | 105 | 125 | 150 | 175 | 190 | 215 | 235 | 260 |

## RECOMMENDED PERMIT CONDITIONS FOR SOIL FUMIGATION WITHIN A GREENHOUSE

## APPENDIX I

### A. Testing Procedure

1. If more than two hours have elapsed since the last test, then a Self-Contained Breathing Apparatus must be worn or testing must be performed remotely.

2. Air monitoring must be performed within the work area where concentrations are assumed to be the highest. The test location(s) will depend on the proximity of people to the application block and the ventilation patterns within the enclosed greenhouse. If the work location is not known or changes over time, several locations need to be tested.

3. The first test must be performed shortly before each work shift and before any people are allowed to enter the greenhouse.

4. The air monitoring results will determine the length of time people will be allowed within the enclosed greenhouse. Work time is the cumulative amount of time a person spends within the greenhouse. It does not include time spent outside of the greenhouse.

   Use the following work and testing schedule **for each work shift**. If the work shift will be longer than two hours, then subsequent tests are required. If they show higher concentrations than the initial test, then the work schedule must be adjusted to the new concentration. For example: the first test shows 1 ppm methyl bromide in the work area. People may occupy that area for up to four hours, providing a second test is performed after two hours. If the second test shows that the level of methyl bromide has risen to **3 ppm**, then the people must be removed from the work area because according to the chart, they are allowed two hours of exposure at that level of methyl bromide.

**Suggested Table for Time Restrictions: Colorimetric Tube Monitoring**

| Maximum PPM Allowed Per Test Required | Work Time Restriction (Per 24 hours) | Colorimetric Tube | Tests Required |
|---|---|---|---|
| 5 ppm | 1 hour | 5 ppm or less | initial test |
| 3 ppm | 2 hours | 3 ppm or less | initial test |
| 1 ppm | 4 hours | 1 ppm or less | initial test, repeat at 2 hours |
| ND* | 8 hours | 0.5 ppm or less | initial test, repeat every 2 hours |

*ND – no detectable amount

## APPENDIX I (Continued)

### Suggested Table for Time Restrictions: Real-time Monitoring

| Restriction (Per 24 hours) | Real-time Monitoring Results | Restriction (Per 24 hours) | Real-time Monitoring Results |
|---|---|---|---|
| 1 hour | 2.6 to 5 ppm | 6 hours | 0.72 to 0.83 |
| 2 hours | 1.67 to 2.50 | 7 hours | 0.64 to 0.71 |
| 3 hours | 1.27 to 1.66 | 8 hours | ND to 0.63 ppm |
| 4 hours | 1.10 to 1.26 | Unlimited | <0.5 ppm (ND*) |
| 5 hours | 0.84 to 1.09 | | |

*ND – no detectable amount

5. Testing and work time restrictions continue until the end of soil aeration and air monitoring within the greenhouse shows that airborne levels of methyl bromide are less than 1 ppm. Testing may be discontinued, prior to completion of aeration, if no further work will take place within the greenhouse.

6. Employers must maintain records of the air monitoring results. The record must include, at least, the date/time of fumigation and air monitoring; person performing the test(s); greenhouse site identification; location of the fumigation within the greenhouse; location(s) of the air monitoring test(s); colorimetric tube model number and detection limit; and the colorimetric tube reading(s). The information may be recorded on the following form. These records must be made available to employees upon request.

| | Test 1 | Test 2 | Test 3 |
|---|---|---|---|
| Greenhouse Site Identification | | | |
| Fumigation Location | | | |
| Application Block Size | | | |
| Rate of Methyl Bromide | | | |
| Date/Time Start of Fumigation | | | |
| Date/Time Start of Aeration | | | |
| Person Performing Test(s) | | | |
| Date/Time of Test(s) | | | |
| Test Location(s) | | | |
| Test Results (ppm) | | | |
| Colorimetric Tube Model No. | | | |
| Colorimetric Tube Detection Limit | | | |
| Comments | | | |

**APPENDIX I (Continued)**

**B. Air Monitoring Equipment**

There are different methods available for air monitoring. These include colorimetric detector tubes (e.g., National Draeger, Sensidyne, Matheson-Kitagawa, MSA) and real-time remote sensing monitors (e.g., PureAire Monitoring Systems). ***NOTE*: These air monitoring methods apply to enclosed areas, including greenhouse soil fumigation *and* commodity fumigation.**

Colorimetric detector tubes (approximately ¼" X 6") produce a color change when methyl bromide is present. The length of this color change indicates the methyl bromide concentration. A specific pump must be used with these tubes; both must be purchased from the same manufacturer. The (upper and lower) detection limits of these tubes vary with manufacturer and model.

Select the tube model which best fits your needs; contact the test equipment manufacturer. The choice of detector tube is in part determined by the duration of exposure. If short-term access (less than one hour) is necessary, a detector tube that measures to 5 ppm would be adequate. To determine entry for longer times or to document that control methods are adequate, a detector tube that measures to a lower detection limit would be appropriate.

A real-time remote sensing monitor could be used as a continuous monitor for methyl bromide concentrations in fumigation chamber control rooms, commodity storage facilities, commodity chilling rooms, and other processing and storage areas where methyl bromide-treated commodities may be present. Areas monitored by this type system, or its equivalent, should not require colorimetric tube sampling.

A real-time monitoring system, equipped with remote sensors or sensor intake ports capable of a minimum detection value of 500 ppb methyl bromide and having a detection lag-time of two minutes or less, may be used to monitor areas where methyl bromide air concentrations may immediately exceed DPR guideline values (630 ppb) or where the buildup of methyl bromide from the off-gassing commodity may also cause concentration greater than 630 ppb. Such a system must include a warning function to indicate where air concentrations have exceeded 630 ppb and an alarm for when concentrations exceed 5 ppm. The system must also include a digital display and be capable of data-logging. Before installation of this type of system, it is strongly recommended that DPR's Worker Health and Safety (WHS) Branch be consulted for proper placement of remote sensors/ports. All manufacturer's requirements and recommendations must be followed. Facilities that install these units as a replacement for colorimetric tube testing should be required to contact WHS staff to confirm the unit's monitoring results.

# Subsection C.7.4

# Approved Alternatives

**Introduction**

This section provides alternatives approved by the Director of DPR.

**In this section**

This section contains the following topics.


| Part / Topic | See Page… |
|---|---|
| 7.4.1—Nighttime Applications of Metam-Sodium | C-140 |
| 7.4.2—Drench Application Method of Metam-Potassium or Metam-Sodium | C-142 |
| 7.4.3—Metam-Potassium and Metam-Sodium Sprinkler 4:00 a.m. Start Method | C-144 |

# Part 7.4.1

## Nighttime Applications of Metam-Sodium

**Introduction**

Pursuant to Title 3, California Code of Regulations (3 CCR) section 6452, DPR has approved interim use of certain metam applications at night within ozone nonattainment areas[1] (NAAs) for volatile organic compounds (VOCs).

**Effective dates**

The methods described below may be used for three years effective May 1, 2008 (expires on April 30, 2011), contingent on the submittal of additional information to more accurately document the emissions from these fumigation methods.

**Restrictions**

Effective May 1, 2008, expiring on April 30, 2011:

- The metam-sodium night sprinkler method during May-October is approved for use in the Sacramento Metro and South Coast ozone NAAs, but **not** the San Joaquin Valley, Southeast Desert, or Ventura ozone NAAs.
- The metam-sodium night shallow injection method is approved for use in all five ozone NAAs.
- These fumigation methods may be used anytime outside of ozone NAAs and within any ozone NAA outside the May-October period, consistent with all VOC fumigation method restrictions.

**Night sprinkler application, two post-fumigation water treatments**

**For Night Sprinkler Application with Two Post-Fumigation Water Treatments:**

- The field must receive an initial irrigation at a rate of 0.20 inches immediately prior to application.
- The fumigation application must be initiated no earlier than 0100 hours and be applied at a minimum rate of 0.20 acre-inches/hour.
- Post-fumigation water treatments must be consistent with the requirements described in 3 CCR section 6450.1(d)(2).

*Continued on next page*

[1] A map of California ozone nonattainment areas (NAAs) is available in Appendix G and on the DPR Web site at http://www.cdpr.ca.gov/docs/emon/vocs/vocproj/maps/naa-statemap.pdf

**Night shank application, two post-fumigation water treatments**

**For Night Shank Application with Two Post-Fumigation Water Treatments**

- Fumigation application must start no earlier than 0100 hours.
- Post-fumigation water treatments must be consistent with the requirements described in 3 CCR section 6450.1(d)(2).
- The following fumigation equipment and procedures must be used:
  - i. Before application, thoroughly cultivate the field to remove clods with a disc or spring tooth bar. Soil must contain adequate moisture (as stated in 3 CCR section 6450.1(b)) prior to application.
  - ii. The application equipment must meet the following criteria:
    - The shanks must be set on three tool bars, with the bars spaced 12-16 inches apart from front to back.
    - The shanks must be staggered on each tool bar to produce a final overall shank spacing of 9-11 inches.
    - Injection depth on each shank must be at 3-4 inches, 6-7 inches, and 9-10 inches.
    - Nitrogen must be used to purge the system before the applicator bar is lifted out of the ground at any time.
  - iii. Compaction equipment:
    - The application tool bars must be followed by a ring roller that is at least as wide as the application tool bars, with four gauge wheels controlled by hydraulic cylinders to control depth and or pressure; **or**
    - The application tool bars must be followed with a coil packer that is at least as wide as the application tool bars.

**New method codes for field fumigation methods**

Since both application methods are new, the following will be used for the fumigation code on the Pesticide Use Reporting and the Field Fumigant VOC Emission Allowance forms:

| Method code | Emission rating (%) | Regulation section field fumigation method |
|---|---|---|
| 1452 | 77 | 6452(b)(1) Night Sprinkler/Broadcast or Bed/ Two Water Treatments |
| 1455 | 28 | 6452(b)(1) Night Nontarpaulin/Shallow/Broadcast or Bed/ Two Water Treatments |

# Part 7.4.2

## Drench Application Method of Metam-Potassium or Metam-Sodium

**Introduction**

Pursuant to Title 3, California Code of Regulations (3 CCR) section 6452, DPR has approved interim use of the drench application method using either metam-potassium or metam-sodium with limits on the application rate within ozone nonattainment areas[1] (NAAs) for volatile organic compounds (VOCs).

**Effective dates**

The methods described below may be used for three years effective May 14, 2008 (expires on May 13, 2011), contingent on the submittal of additional information to more accurately document the emissions from this fumigation method.

**Regulatory standards**

Title 3, CCR section 6452 sets different standards by which to evaluate whether a new fumigation method will be allowed, one for the Sacramento Metro and South Coast ozone NAAs and one for the San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs. Sacramento Metro and South Coast have a less stringent standard because no further VOC reductions from pesticides are needed in these ozone NAAs.

Both "low-emission" and "high-emission" methods can be used in the Sacramento Metro and South Coast ozone NAAs. Only "low-emission" methods are allowed in the San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs during the May–October peak ozone season.

**Restrictions**

Effective May 14, 2008, expiring on May 13, 2011:

- The metam-potassium and metam-sodium drench method is approved for use during May 1–October 31 in the Sacramento Metro and South Coast ozone NAAs **and** the San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs, with restrictions.
- This fumigation method may be used anytime outside of ozone NAAs and within any ozone NAA outside the May-October period, consistent with all VOC fumigation method restrictions.

*Continued on next page*

[1] A map of California ozone nonattainment areas (NAAs) is available on the DPR Web site at http://www.cdpr.ca.gov/docs/emon/vocs/vocproj/maps/naa-statemap.pdf

## Drench Application Method of Metam-Potassium or Metam-Sodium, Continued

| | |
|---|---|
| **Sacramento Metro and South Coast ozone NAAs, May 1 – October 31** | Drench application method from May 1–October 31:<br>• Metam-potassium application rate must not exceed 270 pounds active ingredient per acre.<br>• Metam-sodium application rate must not exceed 246 pounds active ingredient per acre.<br>• Soil moisture at the time of application must meet the requirements described in 3 CCR section 6450.1(b).<br>• Fumigations must start no earlier than one hour after sunrise and must be completed no later than one hour before sunset.<br>• Two post-fumigation water treatments as specified in 3 CCR section 6450.1(d)(2)(A) must be applied.<br>• Pesticide use reports must identify these applications using field fumigation method code 1413. |
| **San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs, May 1 – October 31** | Drench application method from May 1–October 31:<br>• Metam-potassium application rate must not exceed 98 pounds active ingredient per acre.<br>• Metam-sodium application rate must not exceed 90 pounds active ingredient per acre.<br>• Soil moisture at the time of application must meet the requirements described in 3 CCR section 6450.1(b).<br>• Fumigations must start no earlier than one hour after sunrise and must be completed no later than one hour before sunset.<br>• Two post-fumigation water treatments as specified in 3 CCR section 6450.1(d)(2)(A) must be applied.<br>• Pesticide use reports must identify these applications using field fumigation method code 1413. |

# Part 7.4.3

## Metam-Potassium and Metam-Sodium Sprinkler 4:00 a.m. Start Method

**Introduction**

Pursuant to Title 3, California Code of Regulations (3CCR) section 6452, DPR has approved interim use of the metam-potassium or metam-sodium[1] (metam, MITC) sprinkler 4:00 a.m. start application method within ozone nonattainment areas[2] (NAAs) for volatile organic compounds (VOCs).

**Effective dates**

The methods described below may be used for three years effective August 7, 2008 (expires on August 6, 2011), contingent on submittal of additional information to more accurately document the emissions from this fumigation method.

**Restrictions**

Effective August 7, 2008, expiring on August 6, 2011:

- The MITC sprinkler 4:00 a.m. start time is approved for use during May 1 – October 31 in the Sacramento Metro and South Coast ozone NAAs **and** the San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs, with restrictions.
- This fumigation method may be used anytime outside of ozone NAAs and within any ozone NAA outside the May 1 – October 31 period, consistent with all VOC fumigation method restrictions.
- The only restriction, other than labeling requirements, outside the May 1 – October 31 period, is to include field fumigation method code 1472 on pesticide use reports.

**Findings**

The emissions for this fumigation method are approximately 35 percent of the available MITC. DPR has assigned the following emission ratings to this method:

- Metam-sodium and metam-potassium sprinkler 4:00 a.m. start method: 35 percent.

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[1] Metam-potassium and metam-sodium generate methyl isothiocyanate (MITC).
[2] A map of California ozone nonattainment areas is available on the DPR Web site at http://www.cdpr.ca.gov/docs/emon/vocs/vocproj/maps/naa-statemap.pdf

**Findings** (continued)

Low-emission application methods must achieve an emission rating of 28 percent or less. Therefore, this application method cannot be considered a low-emission method based upon the emission rating. However, this method can be considered a low-emission method if the maximum application rate is adjusted to a level that ensures the emission rate (emission rating multiplied by the maximum application rate) does not exceed 51 pounds of MITC per acre, equivalent to 290 pounds of metam-potassium active ingredient (A.I.) per acre or 260 pounds of metam-sodium A.I. per acre. Table 1 shows the equivalent product application rates.

**Sacramento Metro and South Coast ozone NAAs, May 1 – October 31**

The MITC sprinkler 4:00 a.m. start application method is approved for use, with the following restrictions during May 1 – October 31:

- Fumigations must start no earlier than 4:00 a.m.
- Two post-fumigation water treatments as specified in 3CCR section 6450.1(d)(2) must be applied.
- Pesticide use reports must identify these applications using field fumigation method code 1472.

**San Joaquin Valley, Southeast Desert, and Ventura ozone NAAs, May 1 – October 31**

The 35 percent emission rating and an application rate limit support approval of this fumigation method. The MITC sprinkler 4:00 a.m. start application method is approved for use, with the following restrictions during May 1 – October 31:

- Metam-potassium application rate must not exceed 290 pounds A.I. per acre.
- Metam-sodium application rate must not exceed 260 pounds A.I. per acre.
- Fumigations must start no earlier than 4:00 a.m.
- Two post-fumigation water treatments as specified in 3CCR section 6450.1(d)(2) must be applied.
- Pesticide use reports must identify these applications using field fumigation method code 1472.

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# Metam-Potassium and Metam-Sodium Sprinkler 4:00 a.m. Start Method, Continued

Table 1. Maximum product application rates in gallons per acre to meet low emission MITC mass loss criteria of 51 pounds MITC per acre in the San Joaquin Valley, Southeast Desert, and Ventura NAAs during May 1 – October 31.

| Metam Sodium Products | | | | | |
|---|---|---|---|---|---|
| **Company** | **Product Name** | **Reg No.** | **lbs ai/gal** | **Conversion factor[1]** | **Maximum application rate (gal/ac)[2]** |
| AMVAC | AMVAC Metam | 5481-420-AA | 3.18 | 0.8163 | 80 |
| AMVAC | AMVAC Metam 426 | 5481-423-AA | 4.26 | 1.0935 | 60 |
| AMVAC | METAM SODIUM | 5481-350-ZA | 3.18 | 0.8163 | 80 |
| AMVAC | VAPAM | 5481-466-AA | 3.18 | 0.8163 | 80 |
| AMVAC | VAPAM HL | 5481-468-AA | 4.26 | 1.0935 | 60 |
| Buchman Laboratory | BUSAN 1020 | 1448-85-AA | 3.2 | 0.8214 | 80 |
| Taminco, Inc. | Metam CLR 42% | 45728-16 | 4.25 | 1.0909 | 60 |
| Tessenderlo-Kerley, Inc. | SECTAGON 42 | 61842-6 | 4.22 | 1.0832 | 60 |
| **Metam Potassium Products** | | | | | |
| **Company** | **Product Name** | **Reg No.** | **lbs ai/gal** | **Conversion factor** | **Maximum application rate (gal/ac)** |
| AMVAC | K-PAM HL | 5481-483-AA | 5.8 | 1.3154 | 50 |
| Tessenderlo-Kerley, Inc. | SECTAGON-K54 | 61842-7-AA | 5.8 | 1.3154 | 50 |

[1] $conversion\ \ factor = \frac{product\ lb\,MS}{gal} * \frac{73\,MITC\,mol.wt.}{129\,MS\,mol.wt.} * \frac{1kg}{2.2046\,lbs}$

[2] allowed application rate = (65.7kg MITC/ac)/(conversion factor)