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- 1. What is Fumigation?** Fumigation is the act of introducing a pesticide into an enclosed space in such a manner that it disperses quickly and acts in a gaseous state on the target organism. Pesticides formulated as fumigants have physical characteristics which cause them to occupy all air spaces within an enclosed area and to penetrate commodities within these areas. Aluminum and magnesium phosphide fumigants are generally used in space and commodity fumigation, when they are applied to properly sealed structures, containers, or rodent burrows.
- 2. What is a Fumigation Management Plan?** A Fumigation Management Plan (FMP), referred to in Section 21 of the Applicator's Manual, is a written description of the steps designed to plan for a safe, legal and effective fumigation. It is important to note that some plans will be more comprehensive than others. The certified applicator and owner of the property to be fumigated must address characterization of the structure and/or area and include all safety requirements in the plan prior to application. A new FMP is not needed for every fumigation of an individual facility if conditions will not vary other than general updates such as temperature and humidity recordings. The FMP and related documentation, including monitoring records, must be maintained for a minimum of 2 years.
- 3. Is an FMP required, and if so, how does a state enforcement official determine if an FMP is in compliance?** Yes, an FMP is always required for phosphine fumigations, including for rodent burrow fumigation. Since these are site-specific, certain requirements of the FMP may not apply. If this is the case, the plan should state why. The degree of enforcement and compliance with individual FMPs rests with the State Lead Agency.
- 4. Are fumigations only conducted by Certified Applicators?** Although the Federal labeling allows trained workers to do certain activities associated with fumigations, some states may be more restrictive than others and require that a certified applicator always be physically present on site. Therefore, before proceeding with a fumigation, the client

and/or certified applicator should consult with the State lead pesticide regulatory agency to determine regulatory status, requirements, and restrictions for use of fumigants in that state. A directory of state pesticide control officials can be found under the AAPCO website: <<http://aapco.ceris.purdue.edu/htm/control.htm>>

5. **When can a certified applicator turn over supervision of the fumigation to a trained person?** Most fumigation activities are carried out by a certified applicator or by a trained worker under the direct supervision of a certified applicator. As mentioned above, state restrictions and requirements vary. In some states certain specific activities can be turned over to a trained worker to complete the fumigation independently in the absence of a certified applicator. The CA may remain in voice contact if needed but not physically present. These specific activities include:
 - Monitoring the fumigation site for gas leaks and accumulation of phosphine gas above the permitted limit
 - completing the aeration of a structure after the aeration has progressed and stabilized
 - removal of placards after the aeration is completed
 - receiving, aerating and releasing the content of a vehicle fumigated in-transit (Note: transporting vehicles under fumigation over public roads is prohibited)
 - transfer of an unaerated commodity from one in-transit container to another storage site to continue with the fumigation
 - disposal of any spent fumigant
 - maintenance of written records of all permitted actions performed.
6. **Are there circumstances or states when certain fumigation activities conducted by a trained worker in the absence of a certified applicator cannot be done or are not allowed under state law?** Yes. Some states have additional restrictions on fumigation activities that a trained worker can do independently. The front panel of the applicator's manual states "*CONSULT WITH YOUR STATE LEAD PESTICIDE REGULATORY AGENCY TO DETERMINE REGULATORY STATUS, REQUIREMENTS, AND RESTRICTIONS FOR FUMIGATION IN THAT STATE.*"
7. **Does a trained technician have to be supervised?** When a fumigation product is being applied it must be under the supervision of a certified applicator. In many states "Under direct supervision" means the act or process whereby application of a pesticide is made by a competent person acting under the instructions and control of a licensee or certified applicator who is responsible for the action of that person and who is available if and when needed, even though such licensee or certified applicator is not physically present at the time and place the pesticide is applied. However, in some states certain activities as noted previously may not be performed without the physical presence of the CA.
8. **What is voice contact?** Voice contact means that the certified applicator (CA) is supervising the trained worker(s) by maintaining a voice communication, with or without being physically present on site. Voice contact when the certified applicator is present on-site may be accomplished by the use of phones or walkie-talkies in a situation where

the CA and the trained worker are not working at a visible distance to each other (ex. when working at a large facility where several sheds or bins will be fumigated at the same time or while trouble shooting a gas leak after the fumigation has started). When both parties are not physically present on site, voice contact may be accomplished through the use of phones or walkie-talkies.

9. **When does fumigation start and end?** Fumigation starts with the introduction of the fumigant into a space or commodity that has been properly placarded and secured. It ends when aeration has rendered the space or commodity at or below established safe limits specified in the product labeling. Safe disposal of the spent fumigant, according to label directions, must also be conducted following completion of the fumigation.
10. **Is a separate FMP required for each railcar?** The intent of the label is to develop an FMP that will ensure a safe and effective fumigation. This could mean that one plan would be sufficient to include many cars being fumigated at one time or depending on the application process, how secure the area is, location of the cars, etc. more than one plan may be necessary. An FMP could be developed to cover multiple fumigations over the course of multiple days provided conditions remain the same for each fumigation.
11. **When does the responsibility end for the fumigator of in-transit fumigations?** A certified applicator's responsibility ends when the in-transit fumigated rail car is properly labeled, secured and made ready for shipment and the consignee of the shipment is notified with the appropriate documents. This means that the receiver (consignee) is responsible for having a certified applicator or a trained worker (per state requirements) available on-site to receive and process the in-transit fumigated container since once the in-transit vehicle leaves the state where it was fumigated, it falls under the jurisdiction of another state. Other states may be more or less restrictive. *(I would like to add a list of those states that do require a Certified Applicator be present when fumigated railcars are aerated - need to get this from SFIREG.)*
12. **Who is responsible for training of workers and who assures that the workers have completed the appropriate training to open the in-transit fumigated railcars that have been sent to the consignee?** Proper handling of treated railcars at their destination is the responsibility of the consignee. The consignee must be familiar with the properties of phosphide fumigants, worker exposure limits and symptoms and first aid treatment for phosphide poisoning, know how to make gas concentration measurements and have a clear understanding of the particular state requirements regarding the receipt of fumigated railcars. Upon receipt of the railcar, railroad boxcars, shipping containers and other vehicles, a trained person must perform the aeration process and must document in writing that monitoring has been conducted and that aeration has been completed. A certified applicator is responsible for training workers, including those employed by the consignee receiving fumigated railcars. This training must follow the procedures outlined in the applicator's manual registered by EPA, or, by other training which is accepted by state and local authorities. Additionally, trained workers must receive refresher training annually and the records of the training must be retained for a minimum of three years.

13. **What criteria could be used for state approval of training programs?** Most states have regulations in place that would give them criteria for approving training programs for recertification purposes. A similar approval process could also be in place for companies submitting in-house programs used to train individuals who will be receiving fumigated railcars.
14. **What methods are allowed for sending the Applicator's Manuals to the consignee?** There is no restriction in the labeling on how you must send the applicator manual only that it must precede or be attached to the shipment. In addition, you are required to provide written notification that a vehicle is under fumigation. This can be done by fax, email, courier service, etc.; however the label does not specify how you send the manual or provide written notification, only that you must do it. In cases where the shipper and/or applicator has recently sent the applicator's manual (by means of courier, email, etc.) and the receiver is still in possession of the appropriate applicator's manual, the shipper and/or applicator would not have to resend this information however it must be documented that the shipper and/or applicator has verified the information is in the hands of the receiver and is current with up to date information.
15. **If the Applicator Manual is not sent ahead of an in-transit shipment does it need to be attached to each car?** Section 22.5 of the label states that the Applicator's Manual must precede or accompany all transportation containers and other vehicles (note, section 15.5 of the label prohibits transportation of vehicles under fumigation over public roads), which are fumigated in-transit. If there is any possibility or indication that multiple containers/railcars undergoing fumigation may be separated or shunted while in-transit, a copy of the manual must be attached to each container or railcar.
16. **What is meant by written notification and how often must this be done?** The shipper and/or the fumigator must provide written notification to the receiver of railcars, railroad boxcars, shipping containers and other vehicles which have been fumigated in transit. The purpose of written notification is to ensure that the site receiving the fumigated vehicle is aware of the fumigation and has an adequate program in place to properly receive a fumigated railcar (trained or certified personnel, detection equipment and disposal equipment), etc. The consignee must receive a copy of the product's Application Manual in addition to the written notification. It is important to note the shipper typically notifies the receiver of in-transit fumigated vehicles. A contracted certified applicator is not usually involved in the fumigation agreements between shippers and receivers and would not be aware of the end destination of the vehicle. In addition, vehicles may be re-routed in-transit and may not end up at the original destination.

For fumigations performed on stationary sites, written notification must be provided to local officials such as the fire and police departments. These officials should be provided with the product's MSDS and the Applicator's Manual. Section 14 of the Manual includes this requirement.

The label does not specify how often notification must occur, whether prior to each

fumigation or on an annual basis. As an example, local officials may not want to be notified every day that railcars are fumigated as long as they are aware that this will be a seasonal or on-going activity at a particular facility. If fumigated railcars will be received on a regular basis, annual notification to the receiver may be sufficient. State or local authorities may have more restrictive requirements and must be consulted on this matter.

17. **What is the purpose of the ‘Guidance’ section of the FMP?** The intent of Section 21 is to provide more detailed information to the applicator on how to prepare an FMP for as many different types of fumigation sites as possible.
18. **What is the purpose of the ‘Applicator Procedure’ section of the applicator manual?** Section 22 contains the same information as this section on previous labeling to provide more detail for different types of common fumigation sites.
19. **What is Application? Is this different for different types of fumigation?** Application means introducing the solid, liquid or gas fumigant product into an empty space, an area containing a commodity, or a rodent burrow. In most cases with space fumigations, the fumigant is applied from outside without actually entering the structure. Application methods differ depending upon (i) the fumigant formulation being used, (ii) site/area being treated and (iii) the target pest. For example, fumigation of infested grain using a solid fumigant product may involve pellets or tablets walked into the surface of the grain, applying pellets down into the grain mass with a probe, or the use of an automatic dispenser which uniformly applies the fumigant throughout the grain mass as the bin or silo is filled. When liquid phosphine (liquified gas or liquified gas under pressure) is used as a fumigant, it is introduced into the treated site with approved tubing where it disperses as a gas for quick distribution throughout the fumigated area. Outdoor rodent burrows are fumigated by placing pellets or tablets into the burrow and lightly sealing the entrance/exit.
20. **What is a structure?** “Structure” means any building regardless of its design or the type of material used in its construction, whether public or private, vacant or occupied, the foundation thereof, and the adjacent enclosed areas. It shall also include but shall not be limited to warehouses, trucks, boxcars, railcars, ship holds, boxes, tarp covered stacks, other vehicles, or the contents thereof, and fumigation vaults.
21. **What is an adjacent enclosed area?** A space that is located next to or near a structure that is being fumigated and has the potential for the phosphine gas to enter into and accumulate or remain in this area. If people or domestic animals may enter into this area during the fumigation or aeration process, you are required to conduct monitoring to be sure no one is exposed above the permitted level of 0.3 ppm on an 8-hour time weighted average.
22. **Is notification required for all fumigations, including burrow?** Yes, as required by local regulations. In addition, if you are treating rodent burrows on a property where inhabited structures are located, the applicator must provide the customer (tenant,

homeowner, or property manager) with the product's MSDS and at a minimum the appropriate parts of the applicator manual prior to application.

- 23. When and who do you notify prior to a rodent burrow fumigation?** Section 26, Burrowing Pest Control, states that prior to treating rodent burrows on a property where inhabited structures are located the person applying the product must provide the customer, ie. the tenant, homeowner or property manager, with an MSDS or appropriate sections of the Applicator's Manual.
- 24. What is the difference between monitoring for safety and monitoring for efficacy?** Monitoring for safety of workers and bystanders is mandatory according to the label and is performed to determine (i) when and where respiratory protection is required, (ii) whether phosphine gas is escaping and is accumulating at unsafe levels in any areas and (iii) to take proper actions to prevent accidental exposure. Once fumigation has started and gas containment has been adequately characterized, spot checks must be made, especially if conditions change significantly or if an unexpected garlic odor is detected (cannot be relied on) or a change in phosphine concentration outside the fumigation area is detected. Section 15 of the Applicator's Manual ("Applicator and Worker Exposure") addresses safety monitoring and also Section C.1 in the "Guidance for Preparation of a Fumigation Management Plan" in the Applicator's Manual outlines safety monitoring.
- Monitoring for efficacy involves the placement of test lines within the structure and determining whether adequate phosphine gas concentration has been reached. Efficacy monitoring will also help to determine whether or not to add more fumigant during fumigation because of poor distribution within the structure or to supplement loss due to leakage. This type of monitoring is not mandatory per labeling and is only recommended. Section C.2 of the "Guidance for Preparation of a Fumigation Management Plan" in the Applicator's Manual outlines monitoring for efficacy.
- 25. Who is allowed to conduct and document monitoring?** The certified applicator is responsible for the fumigation and would be the person responsible for ensuring plans are in place for conducting safety monitoring during the fumigation period. Trained workers or the certified applicator may perform monitoring (trained individuals may want to verify gas concentration in a railcar prior to aerating, or verify efficacy of grain fumigation underway, etc.). Trained workers must know how to properly use the detection equipment and how to implement site specific evacuation procedures if necessary.
- 26. How is monitoring done?** There are a number of devices on the market for the measurement of phosphine gas. The devices range from glass tubes to electronic equipment. Knowledge of the use and limitations of such devices are part of the training program for fumigation workers. Registrants of phosphine products also serve as an additional source for information on these devices.
- 27. Is monitoring required for all fumigations? If not, when is it required and when is it not required?** Monitoring for safety is always required unless it can be

confirmed/concluded by the certified applicator that there is no possibility of exposure to phosphine at or above the allowable limits to workers or bystanders. Monitoring must be done if there is even the slightest possibility of exposure. Exposures to phosphine must not exceed the 8-hour Time Weighted Average of 0.3 ppm or the 15-minute Short-Term Exposure Limit (STEL) of 1.0 ppm.