

Module 1: PESTICIDE COMPLIANCE

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*Facilitator’s Guide:*

Integrated Pest Management (IPM)   
and Fumigation Safety



***Facilitator’s Guide:***

Integrated Pest Management (IPM) and Fumigation Safety Training

**Module 1:**

**Pesticide Compliance**

The Technical and Operational Performance Support (TOPS) Program is the USAID/Food for Peace-funded learning mechanism that generates, captures, disseminates, and applies the highest quality information, knowledge, and promising practices in development food assistance programming, to ensure that more communities and households benefit from the U.S. Government’s investment in fighting global hunger. Through technical capacity strengthening, documentation and innovation, and an in-person and online community of practice (the Food Security and Nutrition [FSN] Network), The TOPS Program empowers food security implementers and the donor community to make lasting impact for millions of the world’s most vulnerable people.

The original TOPS Program was a consortium of five partner organizations: CORE Group, Food for the Hungry, Mercy Corps, Save the Children, and TANGO International. The original TOPS Program ended in January of 2018, but was extended through an activity called TOPS Bridge. The TOPS Bridge activity maintains a few key TOPS functions and provides important services to the food security and nutrition community, focusing on knowledge management, commodity management, and theory of change. The TOPS Bridge activity includes two partner organizations: CORE Group (through November 2018) and Save the Children (ongoing).

**Disclaimer:**

The Technical and Operational Performance Support (TOPS) Program is made possible by the generous support and contribution of the American people through the U.S. Agency for International Development (USAID). The contents of this guide were created by The TOPS Program and do not necessarily reflect the views of USAID or the U.S. Government.

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Save the Children

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Abbreviations and Acronyms

CFR U.S. Code of Federal Regulation

CM commodity management

CSB corn-soy blend

EMMP Environmental Mitigation and Monitoring Plan

FFP USAID Office of Food for Peace

FIFO first in first out

FMP Fumigation Management Plan

FSN food security and nutrition

IEE Initial Environmental Examination

IPM integrated pest management

NGO non-governmental organization

PCI Project Concern International

PEA programmatic environmental assessment

PERSUAP Pesticide Evaluation Report and Safer Use Action Plan

PPE personal protective equipment

PVO private voluntary organization

SUAP Safer Use Action Plan (part of the PERSUAP)

TOPS Technical and Operational Performance Support

USAID U.S. Agency for International Development

Acknowledgements

The TOPS Program would like to thank Project Concern International (PCI) for their efforts to raise awareness on fumigation safety*.* With a TOPS Small Grant, and in coordination with the Department of Grain Science and Industry at Kansas State University, they organized an Integrated Pest Management (IPM) and Fumigation Safety training workshop, which provided the raw material for this facilitator’s guide. They also produced most of the videos that accompany this guide.

The TOPS Program would also like to thank all participants of the IPM and Fumigation Safety training workshops held during 2017 and 2018 in Bangladesh, Ethiopia, DRC, and Malawi. Their questions and insights helped refine the materials presented here.

Introduction

This guide is one piece of a **larger curriculum** designed to assist non-governmental organization (NGO) staff decrease losses of stored food commodities due to pests. The curriculum includes a Workshop Design Guide and the three technical modules summarized below.

| **Module** | **Time Required** | **Performance Objective[[1]](#footnote-1)**  *(What learners can DO as a result of training)* | **Target Audience**  *(Who NEEDS to know material presented)* |
| --- | --- | --- | --- |
| 1. **Pesticide Compliance** | 3 hours | Complete a Safer Use Action Plan (SUAP) and a Fumigation Management Plan (FMP) for phosphine, per USAID requirements | Senior program and commodity management staff and all staff who will be contracting, supervising, or monitoring fumigation service providers |
| 1. **Integrated Pest Management (IPM)** | 3½ hours | Identify and implement appropriate practices to minimize commodity loss due to pests in the warehouse | Commodity management and **all warehouse staff** |
| 1. **Phosphine Fumigation** | 3½ hours | Monitor service providers to ensure safe and effective phosphine fumigation of stored commodities | Commodity management and all staff who will supervise or monitor fumigation service providers |

All three modules can be delivered sequentially in a two-day training workshop. A single module can also be delivered on its own to a specific target audience. Each technical module is therefore presented in its own stand-alone guide.

This **Module 1** guide covers the **regulations** concerning pesticide use with stored commodity in USAID-funded activities. Knowledge of these regulations is essential for program management, commodity management, and any other staff responsible for completing or monitoring the USAID Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP). Failure to follow USAID regulations concerning pesticide use may place a project in the “non-compliance” category, which could end the project. While not essential, this module is also suitable for other staff who want to understand the “why” behind USAID regulations for the use of phosphine.

All guides provide detailed session plans for facilitating either a **Presentation** or an **Activity**. A sample agenda for this module is located in Annex 1. **Handouts** for distribution to learners (such as small group activity instructions) are illustrated immediately after the session plan to which they apply.   
External materials to support these guides are located in the following four separate folders. Annex 5 provides a complete list of these materials.

| **Folder Name** | **Contents** |
| --- | --- |
| **PRESENTATIONS** | PowerPoint slide decks corresponding to each presentation. |
| **HANDOUTS** | MS Word versions of the handouts illustrated in the guides, for adaptation to local context and printing for distribution. |
| **VIDEOS** | Twelvevideos illustrating proper fumigation procedures and use of safety equipment. Applicable to Module 3. |
| **RESOURCES** | Reference materials that can be provided to learners electronically. |

The guides use the following icons for ease of access to specific information:

|  |  |
| --- | --- |
| **Icon of clock** | **Time**: An estimated total time recommended for the corresponding session. Most sessions are very interactive and actual time will depend on the number of learners participating. The more learners, the longer the session. |
| **Icon of dartboard with bullseye** | **Module objective:** What a learner should be able to *do* in the workplace once she or he masters the content delivered in the module.  **Learning objective:** The knowledge or skill a learner should be able to demonstrate at the end of the session (usually measured with a post-test).  **Purpose:** Rationale for including a specific small group activity. |
| **Icon of pens, Post-Its, and scissors** | **Materials:** Theapplicable PowerPoint slide deck for a facilitator’s presentation or supplies necessary for activities (such as markers, Post-Its). |
| Icon of paper with text | **Handouts:** Additional information that should be printed and distributed to learners. Where applicable, the session plan provides information on **when to distribute** a handout. |
| **Icon of clipboard with checkmark** | **Methodology:** A description of necessary preparation and the suggested training delivery methods, talking points for a presentation, or step-by-step instructions for an activity. |
| **Icon of a key** | **Key Facilitator Notes:** Additional information or helpful hints to ensure smooth facilitation of a session. |

Module 1: Pesticide Compliance

## Overview

|  |  |
| --- | --- |
| This module introduces the learner to the **regulations** concerning pesticide use with stored commodity in USAID-funded programmes. As the implementation of these regulations will be fully explored in subsequent modules, it also establishes context for the training.  Knowledge of the regulations covered in this module is essential for Program Management, Commodity Management, and any other staff responsible for completing or monitoring the USAID PERSUAP. It is also essential for all staff who will be contracting, supervising, or monitoring fumigation service providers. | |
| **Icon of clock** | **Allow 3 hours to complete the entire module.** |
| **Icon of dartboard with bullseye** | **Module Objective:** Complete a *Safer Use Action Plan* and a *Fumigation Management Plan* for phosphine. |
| Icon of clipboard with checkmark | The module begins with a **20 minute presentation** on “compliance” in terms of pesticide use in commodity warehouses in general, with specific emphasis on phosphine gas. Two documents required by USAID are described: the *Pesticide Evaluation Report and Safer Use Action Plan* (PERSUAP) and the *Fumigation Management Plan* (FMP).  To address the module performance objective, two small group activities provide hands-on experience with these documents. These small group activities also provide an overview of the entire fumigation process from preparation through clean-up. |
| **Icon of a key** | The *Guidelines for Fumigation Compliance Process for USAID Partners* in Annex 2 summarize the regulations covered in this module. Ensure complete familiarity with this material before beginning the module.  These guidelines can also be found in the HANDOUTS folder where they are part of small group Activity 1.1. |

## Presentation

|  |  |
| --- | --- |
| **Icon of clock** | 30 minutes for presentation (does **NOT** include the small group activities) |
| **Icon of dartboard with bullseye** | **Learning Objective**: At the end of this session, learners will understand the USAID requirements for phosphine fumigation of stored commodity. |
| Icon of pens, Post-Its, and scissors | * Slide deck: *Module 1\_Compliance* |
| Icon of paper with text | * *Compliance HANDOUT* (printed copy of PowerPoint slides for note-taking)   Optional (available in Resources folder):   * *EMMP Factsheet* * *USAID Phosphine Fumigation PEA Annex A TOOLS* |
| Icon of clipboard with checkmark | PowerPoint guidedpresentation. See the **Slide Narration** section below for details of key messages. **NOTE**: Practice the PowerPoint presentation in “Slide Show” mode to become familiar with the animation built into the slide deck. |
| **Icon of a key** | Ensure there is understanding of the difference between the **PEA**, a **PERSUAP** (in general), and the program-specific **SUAP**. In summary:   1. The Phosphine Fumigation of Stored Agricultural Commodity Programmatic Environmental Assessment (Fumigation **PEA**) **established environmental, health, and safety requirements** for the phosphine fumigation of all USAID food assistance commodity. (Requirements established by the PEA are **also** sometimes referred to as mitigation measures/actions, or conditions.)   These requirements (mitigation measures/actions, or conditions) include the following:  Implement **IPM** (including good housekeeping such as cleaning, and first in first out [FIFO])  Complete a fumigation management plan (**FMP**) – which requires:   * + Use of **gas impermeable tarps**.   + Use of personal protection equipment, including **canister respirators.**   + Maintain an **exclusion zone** around fumigated area for 7-10 days.   + Conduct hazard and efficacy monitoring   + Ensure proper storage and handling of phosphine   + Enforce and monitor these requirements and **take corrective action as required**  1. An approved **PERSUAP authorizes an organization to use phosphine** (and any other pesticide described in the PERSUAP). 2. The Safer Use Action Plan (**SUAP**), which is part of the PERSUAP, **describes how an organization will implement** these requirements (conditions, or mitigation measures/actions). An updated SUAP is submitted to USAID annually as part of required monitoring. |

**Slide Narration**

| **Slide** | **Key Messages** |
| --- | --- |
| Image of Slide 1. Title slide: Overview of Pesticide Compliance. IEE to FMP. | Slide 1 |
| Image of Slide 2. Performance Objective: Complete a Safer Use Action Plan and a Fumigation Management Plan for phospnine. | Slide 2  Every program responsible for storing food commodity (for distribution) will need to complete a Safer Use Action Plan annually and a Fumigation Management Plan before every fumigation event. |
| Image of Slide 3. Compliance. The module learning objective is to understand the USAID requirements for phosphine fumigation of stored commodities. | Slide 3  Highlight the three parts to this module: an overview of USAID regulations concerning pesticide use, and hands-on experience with two documents required for fumigation with phosphine: the PERSUAP and the FMP. |
| Image of Slide 4. | Slide 4  The U.S. Code of Federal Regulation (CFR) 216 (also called Regulation or Reg. 216) requires organizations to conduct an assessment of the potential environmental impacts of their proposed projects. The output of this assessment process is documentation, including the Initial Environmental Examination (IEE), which can be found here: <http://www.usaidgems.org/reg216.htm>. |
| Most IEE’s establish mandatory environmental “conditions” (mitigation actions) that must be fulfilled during project implementation to protect the environment and human health and welfare. The IEE is submitted as part of the project proposal package, approved by USAID, and revisited as implementation planning begins.  Failure to implement IEE mitigation actions puts a USAID project in a non-compliance category, which can end the project. Systematic implementation of mitigation actions is documented through the Environmental Mitigation and Monitoring Plan (EMMP), which can be found here: <http://www.usaidgems.org/mitMonRep.htm>.   * The purpose of monitoring is to BOTH determine if required actions are being implemented AND to determine whether the actions are sufficient and effective. * An IEE may be general, but an EMMP is specific. The EMMP includes a) indicators/criteria for monitoring implementation, and b) timing and responsibilities of parties. * Implementing partners must report on environmental compliance as part of routine project performance reporting. EMMPs provide a framework for this reporting. | |
| Image of Slide 5. | Slide 5  Section 216.3 (b) establishes specific, **additional** pre-implementation analysis and review requirements that apply to procurement and/or use of **pesticides** in USAID-funded activities. These requirements are satisfied with a “Pesticide Evaluation Report and Safer Use Action Plan” (PERSUAP) which is formally an amendment to the project’s IEE. **Note: The project PERSUAP must be in place before any fumigation can be conducted.** See <http://www.usaidgems.org/Documents/complianceTopics/ST_Pesticides_Safer_UseCompliance_Cairo_10Oct2012.pdf>. |
| Image of Slide 6. | Slide 6  The PERSUAP includes two major sections: the Pesticide Evaluation Report (for **every** pesticide that will be used) and the Safer Use Action Plan, which describes the mitigation actions (measures) for each pesticide. |
| Image of Slide 7. | Slide 7  A Pesticide Evaluation Report examines the risks of using pesticide products and provides opportunities to consider practical actions to reduce these risks. It should provide information on **when** to use pesticides, **which pesticides** to use, and **how** to use them safely. |
| Slide 8. Photo of stacked grain partially covered by a tarp; with images of skull, explosion, and insect superimposed. | Slide 8  Fumigation with the pesticide phosphine gas is a critical tool to assure protection of stored food commodities. It is also an intrinsically dangerous process: phosphine is deadly if inhaled or ingested, flammable and explosive, and ineffective fumigation contributes to phosphine pesticide resistance (in addition to the immediate problem of continued commodity losses). |
| Slide 9. Photo of the Programmatic Environmental Assessment or PEA document. | Slide 9  In recognition of these risks, the USAID Office of Food for Peace (FFP) conducted a study of phosphine fumigants. In other words, USAID has completed the required Pesticide Evaluation Report for Phosphine for all implementing partners! It is available at: <http://www.usaidgems.org/documents/fumigationpea/fumigationpeafeb24_2014.pdf>. |
| The study, called the Programmatic Environmental Assessment (PEA), looked at potential risks (to human health and the environment) of fumigation with aluminum and magnesium phosphide. While it found that phosphine poses significant risks to fumigators, others in the warehouse, and to nearby residents, it concluded phosphine fumigation can be done if certain mandatory environmental “conditions” (in other words, mitigation actions) are implemented. | |
| Image of Slide 10. | Slide 10  The mandatory requirements **established by the PEA** include:   * Fumigators must use respiratory protection and monitor the gas levels (for both safety and efficacy). * A Fumigation Management Plan must be written for each fumigation event. * An exclusion zone (of 100 meters) should be maintained around the fumigated area for 7-10 days. * Mitigation actions, including IPM practices, must be spelled out in the SUAP, and implemented. |
| Image of Slide 11. | Slide 11  While the PEA itself fulfils the USAID requirements for the PER (Pesticide Evaluation Report) portion, projects still must complete the SUAP (Safer Use Action Plan) portion of the PERSUAP, which describes the mitigation actions for phosphine.  Mitigation is the implementation of measures designed to eliminate, reduce, or offset the undesirable effects of a proposed action (such as fumigation) on the environment. |
| Image of Slide 12. Small Group Activity. Instructions 1. Form small groups. 2. Read your section of the PERSUAP template (10 minutes). 3. Answer the questions you have been assigned (10 minutes). 4. In plenary briefly explain your section in 1 or 2 sentences and present answers to your questions (5 minutes). | Slide 12  Purpose: Through hands-on exposure to the required *USAID PERSUAP for Phosphine Fumigation & Contact Pesticides* template, learners will be introduced to the topics covered in detail throughout the training. They will also understand the USAID mandatory environmental, health and safety requirements regarding phosphine of food commodities.  See Activity 1.1 Instructions. |
| Image of Slide 13. PERSUAP summary The PERSUAP is mechanism to address compliance requirements established by the PEA. It 1. Authorizes phosphine fumigation. 2. Authorizes use of specific residual pesticides. 3. Establishes IPM practices (in the SUAP). 4. Serves as compliance tracking and reporting tool. 5. MUST be approved before 1st fumigation. | Slide 13  Remember, when fumigation is conducted by a contracted service provider, that service provider must also comply with all actions described in the PERSUAP. |
| Image of Slide 14. Photo of PEA Tools Annex document. | Slide 14  The PEA study also produced clear guidance and tools for a safer and more effective phosphine fumigation. This information is located in the PEA Tools Annex.  Tools in this Annex include a FMP template and, to facilitate hiring a fumigation service, a sample request for quotation (RFQ) and a sample contract.  **NOTE:** Fumigation service providers can be difficult to find in many countries. If there is a tobacco industry or a multinational food processing industry in the country, ask them who is providing their fumigation services. |
| Image of Slide 15.  1. Respiratory protection. 2. Gas monitoring. 3. Fumigation Management Plan (FMP). 4. Exclusion zone of 100 meters for 7 to 10 days. 5. Implement IPM. | Slide 15  (Review the PEA listed mandatory requirements.)  Issues around respiratory protection and gas monitoring will be discussed in Module 3.  IPM methods are the topic of Module 2.  But before leaving the topic of compliance, we need to look more deeply at the FMP and the exclusion zone. |
| Image of Slide 16. Photo of the Phosphine Fumigation Management Plan [FMP] page 1. Why: Assures fumigant is applied safely & effectively. What :Steps taken before, during and after fumigation. | Slide 16  This slide simply introduces the FMP template, which will be explored in detail in small group. |
| Image of Slide 17. Instructions 1. Form small groups. 2. Read your section of the FMP template (5 minutes). 3. Identify potential difficulties you might encounter completing the section in your organization (10 minutes). 4. In plenary briefly explain your section in 1 or 2 sentences and tell us about any difficulties you anticipate (5 minutes). | Slide 17  Purpose: familiarize participants with the FMP.  See *Activity 1.2 Instructions*. |
| Image of Slide 18. What about compliance with local government regulations? | Slide 18  Facilitate discussion on any local regulations concerning fumigation or pesticide use that will need to be ADDED to the USAID regulations. |

## Activity 1.1: Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP)

|  |  |  |
| --- | --- | --- |
| **Icon of clock** | | 1-1½ hour |
| **Icon of dartboard with bullseye** | | **Purpose**: Through hands-on exposure to the required *USAID**PERSUAP for Phosphine Fumigation & Contact Pesticides* template, learners will be introduced to the topics covered in detail throughout the subsequent training modules. They will also understand the USAID mandatory environmental, health, and safety requirements regarding phosphine of food commodities. |
| Icon of pens, Post-Its, and scissors | | * Facilitator’s Notes for this activity (on subsequent pages) * 1 sheet flip chart paper for each group * Blu tack (to attach sheets to wall) * Markers |
| Icon of paper with text | | * Separate instructions for each of four groups (located in HANDOUTS folder):   + *Activity 1.1\_Group 1*   + *Activity 1.1\_Group 2*   + *Activity 1.1\_Group 3*   + *Activity 1.1\_Group 4* * *Guidelines for Fumigation Compliance Process for USAID Partners* (Annex 2, also located in HANDOUTS folder) * (Optional) *PERSUAP for Phosphine Template* (Annex 3, also located in HANDOUTS folder) |
| Icon of clipboard with checkmark | | This is a small group activity requiring a **minimum of eight learners (two per each of the four small groups)*.*** Groups can have more members if necessary, but the total number of groups should be four. |
| **Step 1:** | **Prepare in advance for this activity.**   * **Carefully** read through the *Guidelines for Fumigation Compliance Process for USAID Partners* and the *PERSUAP for Phosphine Template*. * Each group handout (*Activity 1.1\_Group 1* through *Group 4*) contains the activity instructions, four group-specific questions, and a **section** of the *Guidelines* or the *PERSUAP Template* where answers can be found. Print adequate copies of handouts to **ensure each learner has a copy of the handout for their group**. The four group handout instructions (without their corresponding section reading) are shown below. * Carefully read through the Facilitator’s Notes (below following group handouts) to ensure familiarity with the correct answers for each group. * Print one full copy of the *Guidelines for Fumigation Compliance Process for USAID Partners* for each learner for reference purposes. These copies may be provided to learners at the start of the training event along with other materials such as agenda. | |
| **Step 2:** | Divide the learners into four groups and present activity instructions (which appear on slide 12 of PowerPoint deck for this module). | |
| **Step 3:** | Distribute applicable handouts to each group, and allow 20 minutes for groups to complete the activity. | |
| **Step 4:** | As groups present findings in plenary, ensure all points on the Facilitator’s Notes for this activity are covered. | |
| **Icon of a key** | | Remind learners that:  The **PEA** establishes USAID mandatory environmental, health, and safety requirements regarding phosphine of food commodities.  The **PERSUAP** guides partners in implementation of these requirements (in other words, compliance). |

**Handout: Activity 1.1 Group 1**

1. **Individually read** the document on the following pages (10 min).
2. **Answer the questions below, concerning this section** (10 min).
3. **In plenary**: (5 min)
   * Briefly explain your document (1-2 sentences).
   * Present answers to your questions.
   * Answer any questions posed by the others.

**Reading:** PEA TOOLS ANNEX A-1: *Guidelines for Fumigation Compliance Process for USAID Partners*

**Question 1:** The phosphine fumigation PERSUAP, when approved by USAID, authorizes phosphine fumigation of food commodities for the subject program. Can the PERSUAP be used to obtain approval for contact (residual) pesticides, in addition to phosphine fumigants?

**Question 2:** What must a partner do if unable to meet the requirements established by the PEA?

**Question 3:** When must the PERSUAP be approved?

**Question 4:** What are the **five key requirements** for safer fumigation established by the PEA?

**Handout: Activity 1.1 Group 2**

1. **Individually read** your section of the PERSUAP template on the following pages (10 min).
2. **Answer the questions below, concerning this section** (10 min).
3. **In plenary**: (5 min)
   * Briefly explain your section (1-2 sentences).
   * Present answers to your questions.
   * Answer any questions posed by others.

**Reading:** PEA TOOLS ANNEX A-9: *PERSUAP for Phosphine Template* **Cover** (pages 71-73)

**Question 5:** Which part of the PERSUAP describes the mitigation requirements (safer use conditions) established by the PEA?

**Question 6:** How can a project ensure these requirements or “conditions” are implemented?

**Question 7:** Per Condition 1, what specific fumigation equipment should be detailed in the Fumigation Management Plan (FMP)?

**Question 8:** What does Condition 4 (**Fumigation Contract Language**) require a partner to do?

**Handout: Activity 1.1 Group 3**

1. **Individually read** your section of the PERSUAP template on the following pages (10 min).
2. **Answer the questions below, concerning this section** (10 min).
3. **In plenary**: (5 min)
   * Briefly explain your section (1-2 sentences).
   * Present answers to your questions.
   * Answer any questions posed by others.

**Reading:** PEA TOOLS ANNEX A-9: *PERSUAP for Phosphine Template* **Section 1-5(d)** (pages 75-77)

**Question 9:** If USAID approves the PERSUAP, what type of “determination” will they recommend?

**Question 10:** Why are contact pesticides used?

**Question 11:** Which Integrated Pest Management (IPM) practices are considered essential complements to fumigation?

**Question 12:** What are the “acceptable technical practices” concerning an exclusion zone?

**Handout: Activity 1.1 Group 4**

1. **Individually read** your section of the PERSUAP template on the following pages (10 min).
2. **Answer the questions below, concerning this section** (10 min).
3. **In plenary**: (5 min)
   * Briefly explain your section (1-2 sentences).
   * Present answers to your questions.
   * Answer any questions posed by others.

**Reading:** PEA TOOLS ANNEX A-9: *PERSUAP for Phosphine Template* **Section 6-7** (pages 81-84)

**Question 13:** How soon after fumigation can commodities be distributed?

**Question 14:** Besides describing the mitigation requirements (safer use requirements), what is the Safer Use Action Plan (SUAP) used for?

**Question 15:** What are the six required compliance measures?

**Question 16:** How often must partners report on fumigation compliance?

**Facilitator’s Notes for Activity 1.1**

**Note:** Page numbers refer to location of applicable text in *PERSUAP for Phosphine*.

**Group 1: ANNEX A-1**

**Q 1:** The phosphine fumigation PERSUAP, when approved by USAID, authorizes phosphine fumigation of food commodities for the subject program. **Can the PERSUAP be used to obtain approval for contact (residual) pesticides, in addition to phosphine fumigants?**

Yes, the PERSUAP authorizes the use of specific contact (residual) pesticides as complements to fumigation, on the condition that their use substantively conforms to contact pesticide best practices as set out in Fumigation PEA Annex T-7, EXCEPT as specifically noted. The Fumigation PERSUAP must also cover their use. (The sole exception is if the program has another PERSUAP, e.g. for use of pesticides in agricultural production, and contact pesticide is covered by this PERSUAP.)

**Q 2:** **What must a partner do if unable to meet the requirements established by the PEA?**

They must request an exception from USAID. All substantive changes must be approved.

Note: These exceptions are requested in the annual SUAP (see page 17 of PERSUAP format).

Q 3: When must the PERSUAP be approved?

The PERSUAP must be approved and in place before the program undertakes phosphine fumigation of food commodities.

**Q 4:** **What are the five key requirements for safer fumigation established by the PEA?**

* Use canister respirators or self-contained breathing apparatus (SCBA).
* Conduct hazard and efficacy monitoring.
* Maintain an exclusion zone around fumigated area for 7-10 days.
* Complete a Fumigation Management Plan (FMP).
* Enforce these requirements and take corrective action as required.

**Group 2: ANNEX A-9: PERSUAP TEMPLATE Cover pages** (pages 71-73)

**Q 5:** **Which part of the PERSUAP describes the mitigation requirements (safer use conditions) established by the PEA?**

The SUAP imposes the mitigation requirements (safer use conditions) established by the PEA “Phosphine Fumigation of Stored Agricultural Commodity.”

**Q 6: How can a project ensure these requirements or “conditions” are implemented?**

SUAP requirements (see Sections 6 and 7 of this PERSUAP Template) will be incorporated as needed into program Detailed Implementation Plan (DIP) and budget.

**Q 7:** **Per Condition 1, what specific fumigation equipment should be detailed in the Fumigation Management Plan (FMP)?**

1. Gas monitoring equipment

2. Personal protection equipment (such as the canister respirators or self-contained breathing apparatus mentioned by Group 1)

3. Gas impermeable tarps

**Q 8:** **What does Condition 4 (Fumigation Contract Langusge) require a partner to do?**

When using a third party fumigation service provider, the provided model request for quotation (RFQ) and contract (or substantive equivalent) will be used to procure fumigation services and proposals/quotes will be evaluated based on ability to comply with specified safer use practices, including the procurement and use of gas monitoring equipment, fumigation, and contact pesticide personal protective equipment (PPE) as well as gas impermeable tarps meeting specified requirements.

**Group 3: ANNEX A-9: PERSUAP TEMPLATE Section 1-5(d)** (pages 75-77)

**Q 9: If USAID approves the PERSUAP, what type of “determination” will they recommend?**

Formally, approval of this PERSUAP will assign a **negative** determination to phosphine fumigation (and other pesticides as applicable), subject to the **condition** that the Safer Use Action Plan provided as Sections 6 and 7of the PERSUAP Template, is fully implemented.

**Q 10:** **Why are contact pesticides used?**

The complementary use of contact pesticide in and around warehouses is usually an integral part of the fumigation process to kill insects escaping fumigation and prevent re-infestation of the commodity.

**Q 11: Which Integrated Pest Management (IPM) practices are considered essential complements to fumigation?**

(c) The Safer Use Action Plan requires compliance with Fumigation PEA Annex T-6 on IPM practices. This checklist contains good housekeeping based IPM practices that are essential complements to fumigation, including daily sanitation of the warehouse, clearing warehouse surroundings of weeds on a weekly basis, daily inspections for pests, and strictly adhering to the first in first out (FIFO) rule to minimize the storage time of the commodities in the warehouse.

(List any additional IPM food commodity protection practices to which the program is committing.)

**Q 12: What are the “acceptable technical practices” concerning an exclusion zone?**

(d) … maintenance of an exclusion zone that only fumigation personnel can enter for duration of the fumigation (7-10 days or more). There is some controversy over the optimal exposition time to respect from fumigating the warehouse to aerating it after the phosphine gas has dissipated for efficient pest control. For any clarifications, please contact the Bureau for Democracy, Conflict, and Humanitarian Assistance (DCHA) Bureau Environmental Officer (BEO), [eclesceri@usaid.gov](mailto:eclesceri@usaid.gov).

**Group 4: ANNEX A-9: PERSUAP TEMPLATE Section 6-7** (pages 81-84)

**Q 13: How soon after fumigation can commodities be distributed?**

Food and feed commodities that have been fumigated with phosphine must be held and aerated for 48 hours prior to distribution.

**Q 14:** **Besides describing the mitigation requirements (safer use requirements), what is the SUAP used for?**

The SUAP is a mandatory “safer use action plan and compliance tracker” form. It describes both safer use requirements and how the program will implement these requirements. It serves as a compliance tracking and reporting tool and will be submitted annually with regular reporting requirements.

**Q 15: What are the six required compliance measures?**

1. Good housekeeping IPM measures are implemented.
2. A Fumigation Management Plan is implemented, with the required gas monitoring equipment, PPE, and gas impermeable tarps for fumigation.
3. The use of contact pesticides is limited to pesticides authorized in this PERSUAP and proper application, safety measures, and PPE requirements are equally followed.
4. Best practices in the storage and transport of aluminum phosphide and contact pesticides are carried out.
5. The third party fumigation service provider, if used, is in compliance with specified safer use practices.
6. Compliance monitoring and implementation of corrective actions.

**Q 16: How often must partners report on fumigation compliance?**

An updated SUAP must be submitted annually with regular reporting requirements (usually as part of the program’s Environmental Status Report).

With respect to fumigation, the SUAP satisfies the requirement for an Environmental Mitigation and Monitoring Plan (EMMP). The program EMMP should simply incorporate the SUAP by reference.

## Activity 1.2: Fumigation Management Plan (FMP)

|  |  |  |
| --- | --- | --- |
| **Icon of clock** | | 1+ hour |
| **Icon of dartboard with bullseye** | | **Purpose:** Reinforce the minimum standards introduced in presentation and in PERSUAP exercise; provide an overview of the entire fumigation process. |
| Icon of pens, Post-Its, and scissors | | * Facilitator’s Notes for this activity (on subsequent pages) * Two flipcharts, one labeled “Module 3” and the other labeled “Parking Lot” |
| Icon of paper with text | | * Separate instructions for each of six groups (located in Handouts folder):   + *Activity 1.2\_Group 1*   + *Activity 1.2\_Group 2*   + *Activity 1.2\_Group 3*   + *Activity 1.2\_Group 4*   + *Activity 1.2\_Group 5*   + *Activity 1.2\_Group 6* * *Fumigation Management Plan Template* (in Annex 4, also located in HANDOUTS folder) |
| Icon of clipboard with checkmark | | This is a small group activity for **twelve learners (two per each of the six small groups).** Groups can have more members if necessary, but the maximum number of groups should be six. |
| **Step 1:** | **Prepare in advance for this activity.**   * Carefully read through *Fumigation Management Plan Template* (FMP) to ensure familiarity. * Each group handout (*Activity 1.2\_Group 1* through *Group 6*) contains the **same** activity instructions, as illustrated below. **What differs between the groups are the sections of the FMP that each group is assigned to review.**   Group 1: Commodity and Ownership (Parts A-E)  Group 2: Emergency Planning and Safety (Parts F-J)  Group 3: Equipment and Supplies (Parts K-N)  Group 4: Application and Monitoring - preparation activities (Parts O-Q)  Group 5: Application and Monitoring - continued (Parts R-U)  Group 6: Disposal and Clean-up (Parts V-W)   * The corresponding FMP sections are attached to each group handout, so print adequate copies of handouts to **ensure each learner has a copy of the handout for their group**. * Pre-assign learners to groups based on expertise. In other words, try to place at least one member with some experience in the applicable topic(s) covered in each corresponding group. * Carefully read through the Facilitator’s Notes (below) to ensure familiarity with specific issues to be covered during each small group plenary presentation. * Print one full copy of the *Fumigation Management Plan Template* for each learner. (These copies may be provided to learners at the start of the training event.) Learners may need them for cross-reference to better understand their group-specific sections. | |
| **Step 2:** | Divide learners into six groups and present activity instructions (which appear on slide 12 of PowerPoint deck for this module). | |
| **Step 3:** | Distribute to each learner their group-specific handout containing instructions and the corresponding section of the FMP. Allow 15-25 minutes for groups to complete activity. | |
| **Step 3:** | As small groups present their findings, record issues on flipcharts: one flipchart for issues that will be covered later in Module 3 and one flipchart for “Parking Lot,” or issues that your organization will need to discuss with the local USAID Mission.  Ensure all points on the Facilitator’s Notes for this activity are addressed. | |
| **Icon of a key** | | Remind learners that any deviations from the template (in other words, requests for actions or information that they do NOT think they will be able to provide) must be approved by the local USAID mission before fumigation takes place.  The FMP should always be reviewed with potential fumigation service providers before signing any contract. As standards in the FMP are generally higher than many service providers may be accustomed to, expect to pay more for a compliant contract. |

**Example Activity 1.2 Instructions for All Groups**

**Instructions**

1. Form small groups.
2. Read your section of the *Fumigation Management Plan* template, presented on the following pages (5 min).
3. As a group, discuss any potential difficulties you might encounter completing the section in your organization (10 min).
4. In plenary: (5 min)
   * Briefly describe the type of information requested in your section.
   * Tell us about any difficulties you expect.

**Facilitator’s Notes for Activity 1.2**

The following issues should be highlighted, if not already raised during plenary feedback by small group members.

**1: Commodity and Ownership** (Parts A-E)

D. **Moisture % of commodity** (Many warehouses are not equipped to monitor this.)

E. **Fumigant Product Info and Dosage** (Information on how this data is determined will be covered in Module 3.)

**2: Emergency Planning and Safety** (Parts F-J)

The issue of **100 m exclusion zone** (Brainstorm what CAN be done to protect citizens living or working within 100 m of warehouse.)

I. **Monitoring** (Details on monitoring will be covered in Module 3.)

**3: Equipment and Supplies** (Parts K-N)

K1. and M. **Fumigation sheets** (Where can heavy sheets be procured?)

L., M2., and M3. **Respiratory protection** and **monitoring equipment** (Equipment will be discussed in detail in Module 3.)

**4: Application and Monitoring - preparation activities** (Parts O-Q)

O5. **7-10 days or more for fumigation** (How does this differ from current practice?)

O8. **Warehouse contains only commodity to be fumigated** (How does this differ from current practice?)

**5: Application and Monitoring - continued** (Parts R-U)

U5. **Warehouse aeration** (How does this differ from current practice?)

**6: Disposal and Clean-up** (Part V-W)

V6. **Disposal at least 100 m away** from warehouse (How does this differ from current practice?)

Annex 1: Sample Agenda

**Module 1: Pesticide Compliance**

|  |  |
| --- | --- |
| 08:30 – 09:00 | Workshop Opening (Introductions, Pre-Test, Ground Rules, Expectations, Objectives, Agenda) |
| 09:00 – 9:30 | USAID regulations on the use of pesticides |
| 09:30 – 11:00 | Pesticide Evaluation Report and Safer Use Action Plan |
| 11:00 – 11:15 | *Pause/Break* |
| 11:15 – 12:15 | Fumigation Management Plan |
| 12:15 – 12:45 | Workshop Closure |

Annex 2: Guidelines for Fumigation Compliance

(Annex A-1 in USAID PHOSPHINE FUMIGATION PEA – Annex A: Tools for Implementation – Aug 2016)

With the approval of the “Commodity Protection in USAID Food Assistance Programs by Phosphine Fumigation” Programmatic Environmental Assessment (“Fumigation PEA”), USAID for the first time will have uniform, mandatory environmental, health and safety requirements regarding phosphine of food commodities.

This overview guides USAID implementing partners in complying with these requirements. Partners that follow the instructions in this section, use the templates provided in this Annex A:Tools for Implementation, and follow through on implementation and reporting as specified herein will satisfy the requirements established by the PEA. In areas where Partners are unable to meet the implementation and reporting conditions described herein, they must request an exception from USAID. All substantive changes must be approved.

*Note that this document assumes knowledge of USAID program implementation and management, including the basics of environmental compliance for USAID food assistance activities.*

**OVERVIEW OF FOOD ASSISTANCE PROGRAM FUMIGATION COMPLIANCE**

USAID partner programs that contract for phosphide fumigation of food commodities must assure that such fumigation:

|  |  |  |
| --- | --- | --- |
| * Complies with the mitigation measures set out in section 5.3 of the PEA (see summary box at right). * Report on compliance with these requirements. * Have formal authorization under USAID’s environmental procedures to contract for (generally, “support”) such fumigation.   THE FUMIGATION PERSUAP  A program-specific Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP)[[2]](#footnote-2) for phosphine fumigation is the mechanism by which all three of these requirements are addressed:   * The phosphine fumigation PERSUAP, when approved by USAID, authorizes phosphine fumigation of food commodities for the subject program. * The PERSUAP authorizes such fumigation subject to the condition that the mitigation measures (safer use requirements) set out in section 5.3 of the PEA are implemented. These conditions are set out in the safer use action plan (SUAP) portion of the PERSUAP. |  | Key “safer fumigation” requirements per this PEA.  Fumigation Services RFQs and contracts require conformity with acceptable fumigation practices per annex A-10, including:   * Required use of canister respirators or self-contained breathing apparatus (SCBA) * Required hazard & efficacy monitoring * Required maintenance of an exclusion zone for duration of fumigation event (7-10 days)   Each fumigation event must have a fumigation management plan (FMP) conforming to these practices  USAID partners shall enforce these requirements and take corrective actions as required. |

In summary, the SUAP must establish the following compliance requirements:

1. Implementation of good-housekeeping IPM Measures that are essential complements to fumigation per PEA Annex A-10.
2. Implementation of a **Fumigation Management Plan** (FMP) for each fumigation event. The FMP must substantively conform to the plan provided as Fumigation PEA Annex A-10, EXCEPT as specifically noted. The FMP requires, inter alia, (a) use of canister respirators or self-contained breathing apparatus; (b) monitoring phosphine gas concentrations for hazard and efficacy; and (c) maintenance of an exclusion zone for duration of fumigation event (7-10 days).
3. Completion of the FMP should be included in contracts issued by USAID partners. The **FMP should be provided by the fumigator, aka the fumigation contractor. If the PVO conducts the fumigation (note that most PVOs do not have the in-house expertise and certifications required to conduct fumigations), the PVO is responsible for completing the FMP. Ultimately, the PVO is responsible that an FMP is completed and that a copy remains on site for two years.**
4. Storage and Transport of Aluminum Phosphide, if under program control, will substantively conform to contact pesticide best practices as set out in Fumigation PEA Annex A-10, except as specifically noted.
5. Monitoring and Corrective Actions. Program will actively monitor compliance with above-listed conditions and undertake corrective actions as needed.

* Similarly, the PERSUAP authorizes the use of specific contact (residual) pesticides as complements to fumigation, on the condition that their use substantively conform to contact pesticide best practices as set out in Fumigation PEA Annex A-9, EXCEPT as specifically noted.
* Finally, SUAP also serves as a fumigation compliance tracking and reporting tool; partners must report annually on fumigation compliance as part of their Environmental Status Report[[3]](#footnote-3).
* Add requirement for completion of an FMP in contract; i.e., FMP must be completed and a copy must remain on-site.

**PARTNER PERSUAP DEVELOPMENT RESPONSIBILITY & PROVIDED TEMPLATE**

Development and submission of the PERSUAP is the responsibility of the USAID partner. A template fumigation PERSUAP is provided as Annex A-9 to this Fumigation PEA*.* This template:

1. satisfies the requirements of the PEA;
2. should very substantially reduce USAID partner effort required to prepare and submit an appropriate PERSUAP; and
3. serves as a mandatory fumigation compliance tracking and reporting template that must be submitted with the program’s annual environmental status report.

Note: Formally, the PERSUAP is an amendment to the program’s IEE. As such, it must be cleared by the country or regional mission and by the DCHA Bureau Environmental Officer (DCHA/BEO) in Washington.

**TIMING OF PERSUAP SUBMISSION AND APPROVAL**

The PERSUAP need not be part of a new the program’s IEE. But it must be approved and in place before the program undertakes phosphine fumigation of food commodities.

Following submission and approval, the USAID partner must then comply with the SUAP, and submit the updated SUAP annually to USAID as a part of the program’s Environmental Status Report.

**RELATIONSHIP OF THE SUAP TO THE EMMP**

Food Assistance Programs IEEs require that programs develop an EMMP (Environmental Mitigation and Monitoring Plan) detailing how environmental mitigation and management required by the IEE will be implemented. The SUAP satisfies the requirement of an EMMP for fumigation activities. The overall program EMMP should simply incorporate the fumigation SUAP by reference

Annex 3: PERSUAP Template

Adapted from: ANNEX A-9 Template: Food Commodity Protection PERSUAP for Phosphine Fumigation & Contact Pesticides

The following is a fill-in template for a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) for Commodity Protection by Phosphine Fumigation & Contact Pesticides, and one of the tools of the Fumigation PEA. Following the Fumigation PERSUAP Template is the PEA Environmental Mitigation and Monitoring Plan (PEA EMMP), for the IP’s review.

New Food Assistance Programs supporting phosphine fumigation MUST have an approved Fumigation PERSUAP in place BEFORE supporting phosphine fumigation. If contact (residual) pesticides are to be used as a complement to fumigation, the Fumigation PERSUAP must also cover their use. (The sole exception is if such the program has another PERSUAP, e.g. for use of pesticides in agricultural production, and contact pesticide is covered by this PERSUAP.)

For additional information, refer to Overview section of the Fumigation PEA, which describes the purpose of the PERSUAP and summarizes the requirements it establishes.

The template is highly detailed with respect to Aluminum Phosphide. It is necessarily less detailed for contact (residual) pesticides, as there are a large number of potential products that may be used. Examples of simple PERSUAPs in USAID’s database of 22 CFR 216 documentation can provide guidance as to how to fill in the various fields.

**In areas where Partners are unable to meet the implementation and reporting conditions described herein, they must request an exception from USAID. All substantive changes must be approved.**

Step 1: click: <http://gemini.info.usaid.gov/egat/envcomp/>

Step 2: Click on the "Advanced Search" tab

Step 3: in the first field "Source Document Text Search" enter the name of the contact pesticide that you seek to use.

Step 4: Click on “search” and then on the “PDF” link to view the resulting documents.

|  |  |  |  |
| --- | --- | --- | --- |
| This is a **Food Commodity Protection PERSUAP template**. **Instructions:** Review full text of document. Fill in or replace all green-highlighted fields. If a contact pesticide is to be used, include/fill-in yellow-highlighted fields; otherwise delete. Alter any provided text not applicable to your program; however, be advised that substantive changes to safer use measures may not be approved by USAID. If you wish to make a substantive change to this template you must request an exception from USAID, **Delete this box & clear highlighting before submitting to USAID.** | | | |
| **USAID INITIAL ENVIRONMENTAL EXAMINATION- AMENDMENT FACESHEET PESTICIDE EVALUATION PLAN AND SAFER USE ACTION PLAN (PERSUAP) FOR COMMODITY PROTECTION BY PHOSPHINE FUMIGATION & CONTACT PESTICIDES** | | | |
| **Activity/Project Title: [INSERT TITLE** | | | |
| **Contract/Award Name(s) & Number(s) (if known)** : **Insert contract/ award name and number** | | | |
| **Geographic Location:** I**nsert implementation country and region e.g. Ethiopia/Africa** | | | |
| **Operating Unit(s):** | | | |
| **IEE Amendment (Y/N):** YES | DCN and Date of Original IEE: **insert PEA clearance date** | | |
| Env Compl Database link: **insert link to PEA on ECD** | | |
| **Annual Funding Amount (optional field):** | | | **Life of project Amount:** |
| **Implementation Start/End:** | | | |
| **IEE Prepared by:** I**nsert name, organization, contact info** | | | |
| **Date Prepared**: Updated September 2015 | | | **PEA Expiration Date (if any):** September 2020 |
| **Implementing Partner(s):** | | |  |
| **Recommended Threshold Determination:**   * Categorical Exclusions   Negative Determination  With Conditions | | * Positive Determination * Deferral | |

**Note**: SUAP requirements (see sections 6 and 7 of this PERSUAP Template) will be incorporated as needed into program Detailed Implementation Plan (DIP) and Budget

**SUMMARY OF FINDINGS**

Phosphine fumigation of food commodities and complementary use of the contact pesticide [insert product name] in and around food commodity warehouses for the XXX Program is approved subject to compliance with the Safer Use Action Plan (SUAP) that constitutes sections 6 and 7 of the PERSUAP Template. The SUAP imposes the mitigation requirements (safer use conditions) established by the Programmatic Environmental Assessment “Phosphine Fumigation of Stored Agricultural Commodity.”

**LIST OF CONDITIONS**

**Condition 1:** A **Fumigation Management Plan (FMP)** must describe the fumigation process, including for fumigant pesticide use, storage, transport and disposal. The FMP and the actual fumigation process will substantively conform to the plan provided as Annex A-10 (Template of the FMP) of the Fumigation PEA. This FMP must include the following details on the fumigation equipment:

**1a). Gas monitoring Equipment:** Brand name, model and type of phosphine gas monitoring equipment (electrochemical, photo-ionization or tube type)

**1b) Personal Protection Equipment:** including gas canister masks or self-contained breathing apparatus

**1c) Gas impermeable tarps**: resistant to UV light and tearing along both length and width, and impermeable to phosphine gas

The **TOPS Warehouse Safety and** detailing the safety measures to take before, during and after fumigation, as well as proper disposal and cleanup procedures after fumigation can also be consulted.

**Condition 2:** Any additional **Contact Pesticide(s)** used in warehouse commodity protection must be limited to the pesticide(s) authorized by the PERSUAP and should substantively conform to contact pesticide best practices as set out in the IPM section of Annex 10. The PERSUAP will also include information on the safe use measures and personal protection equipment used in the application of the contact pesticide(s), as well as contact pesticide storage, transport and disposal.

**Condition 3: Good Housekeeping and IPM Measures.** The implementing partner must fully implement the daily/weekly warehouse and commodities inspection checklist (the PM section of Annex A-10) and take maintenance/corrective actions specified. Compliance with this checklist implements a set of IPM measures that are essential complements to fumigation. The implementing partner will also only purchase commodity that is at 13% or less moisture and distribute stocks as quickly as possible in order to ensure full protection against fungal growth, since fungal growth and mycotoxin production cannot be completely controlled by phosphine fumigation.

**Condition 4: Fumigation Contract Language** When using a 3rd-Party Fumigation Service Provider, the provided model RFQ and contract (or substantive equivalent) will be used to procure fumigation services and proposals/quotes will be evaluated based on ability to comply with specified safer use practices, including the procurement and use of gas monitoring equipment, fumigation and contact pesticide PPE as well as gas impermeable tarps meeting specified requirements.

**Condition 5:** The implementing partner will actively **monitor compliance** with the above-listed conditions and undertake **corrective actions** as needed.

APPROVAL OF ENVIRONMENTAL ACTION RECOMMENDED FOR:

**Fumigation PERSUAP for [Name of Program]**

1. **CLEARANCE**

Date

Mission Environmental Officer

Date

Regional Environmental Advisor/Officer\*

Date

Mission Director

Date

A/COR

Date

Office Director (as applicable)

1. **CONCURRENCE**

Date

Bureau Environmental Officer[[4]](#footnote-4)

|  |  |  |  |
| --- | --- | --- | --- |
| Accepted: |  | Not Accepted: |  |

\*Mandatory for non-presence countries

**USAID INITIAL ENVIRONMENTAL EXAMINATION- AMENDMENT**

**Pesticide Evaluation Plan and Safer Use Action Plan (PERSUAP) for Commodity Protection by Phosphine Fumigation & Contact Pesticides**

USAID PROGRAM DATA

**Program Name:** Insert

**Awardee:** insert organization

**Country/Region:** insert country/region

**Period of Performance:** X years (start date – end date)

1. PURPOSE AND SCOPE OF PERSUAP

Upon approval, this Fumigation PERSUAP, submitted as an amendment to the [insert program name] IEE will authorize phosphine fumigation of insert program name food commodities. This PERSUAP will also authorize complementary use of the contact pesticide(s) insert product names in and around empty warehouses for these commodities. Fumigation and contact pesticide use is authorized subject to strict safer use conditions. As described herein, use of fumigation and contact pesticide is necessary for successful program implementation.

Formally, approval of this PERSUAP will assign a **negative determination** to phosphine fumigation and use of the contact pesticide [insert product name], subject to the **condition** that the Safer Use Action Plan provided as Sections 6 and 7of the PERSUAP Template, is fully implemented.

This PERSUAP satisfies the requirements of 22 CFR 216.3(b) (USAID Pesticide Procedures) and puts in place the safer use requirements (mitigation measures) established by the USAID Programmatic Environmental Assessment “Phosphine Fumigation of Stored Agricultural Commodity” (Henceforth the “Fumigation PEA.”)[[5]](#footnote-5)

1. PROGRAM DESCRIPTION

Provide a BRIEF (not more than 1 or 2 paragraph description) of the program

1. COMMODITY PROTECTION NEEDS

List the food commodities being managed. Provide general information about the length of time commodities are typically stored in primary and secondary warehouses. List known pest problems and succinctly describe consequences of failure to adequately control commodity pests. Do not spend more than 1 or 2 paragraphs on this section.

The Fumigation PEA establishes that food commodity protection by fumigation addresses food commodity protection needs that can rarely be completely replaced by other methods. It also establishes that the complementary use of contact pesticide in and around warehouses is usually an integral part of the fumigation process to kill insects escaping fumigation and prevent re-infestation of the commodity.

1. PROPOSED PESTICIDE(S).

This PERSUAP requests approval to use aluminum phosphide[[6]](#footnote-6) as an indoor fumigant at storage facilities for the following commodities: [insert commodity names]. Use is requested of both pellet and tablet formulations with 55-57% active ingredient.

This PERSUAP also requests approval to use the contact pesticide insert product name as a complement to fumigation in and around food commodity warehouses.

1. FACTOR ANALYSIS PER 22 CFR 216.3(B)(1)(I)(A THROUGH L)

This section provides the 12-factor analysis required by 22 CFR 216.3(b) to allow USAID to make a determination as to whether to permit use of a proposed pesticide and to establish appropriate safer use conditions.

FACTOR ANALYSIS FOR ALUMINUM PHOSPHIDE

| **ANALYSIS FACTOR** | | **ANALYSIS** |
| --- | --- | --- |
| **(a) USEPA registration status of the proposed pesticide.**  **Partner country registration status** | | Aluminum phosphide is an inorganic phosphide registered in the U.S. under CAS Number 20859-73-8 with U.S. EPA PC Code 066501. Aluminum phosphide is a Restricted Use Pesticide (RUP) so in the US may be purchased and used only by certified applicators. It is in EPA’s toxicity Class I, and products containing it must bear the signal word DANGER. In contact with water, it produces a toxic gas *hydrogen phosphide*. Aluminum phosphide is widely used for fumigation of food commodities and structures.  Provide analogous partner country registration information and any restrictions established by this registration. |
| **(b) Basis for selection of the pesticide** | | The selection of aluminum phosphide is based on: efficacy against pests of stored grains, low cost, availability in country, and registration in country.  If used in accordance with safeguards, aluminum phosphide is not expected to have adverse environmental impacts; this is also a factor in its selection.  Efficacy and the effectiveness of use safeguards have already been assessed extensively in the Fumigation PEA and thus are not addressed further here.  The selection was also based on the availability of a qualified professional service provider for phosphine fumigation. |
| **(c) Extent to which the proposed pesticide use is, or could be, part of an IPM program** | | The Safer Use Action Plan requires compliance with the IPM section of Annex A-10. This checklist contains good-housekeeping based Integrated Pest Management (IPM) practices that are essential complements to fumigation, including daily sanitation of the warehouse; clearing warehouse surroundings of weeds on a weekly basis; daily inspections for pests; and strictly adhering to the first in first out (FIFO) rule to minimize the storage time of the commodities in the warehouse.  (List any additional IPM food commodity protection practices to which the program is committing.) |
| **(d) Proposed method or methods of application, including the availability of application and safety equipment** | | Aluminum phosphide will be used for indoor fumigation of warehoused food commodities in sheeted stacks only. It should be noted that the uses specified for Aluminum phosphide in this PERSUAP DO NOT cover outdoor fumigation and soil fumigation.  Via the Fumigation Management Plan, the SUAP requires that fumigation follow acceptable technical practices specified in Annex A-3 on “ GUIDELINES FOR APPLYING BEST MANAGEMENT PRACTICES FOR WAREHOUSE PESTICIDES” of the Fumigation PEA. These include, among others, use of appropriate personal protection equipment, including respirators, maintenance of an exclusion zone that only fumigation personnel can enter for duration of the fumigation (7-10 days or more)[[7]](#footnote-7), and phosphine gas monitoring for efficacy and hazard.  Note if the program’s fumigation services provider will provide PPE and monitoring equipment, or if the program will do so. | |
| **(e) Any acute and long-term toxicological hazards, either human or environmental, associated with the proposed use, and measures available to minimize such hazards.** | | The potential toxicological effects of aluminum phosphide are well covered by EXTOXNET, and Extension Toxicology Network.\* The Fumigation PEA includes details of acute human health exposure and potential impacts to fumigators, other on-site workers, visitors, nearby residents and beneficiaries. In summary:   * The main routes of exposure to aluminum phosphide are through inadvertent ingestion or inhalation during fumigation of the highly toxic gas. * Symptoms of mild to moderate acute aluminum phosphide toxicity include nausea, abdominal pains, tightness in chest, excitement, restlessness, agitation and chills. Symptoms of more severe toxicity include diarrhea, cyanosis, difficulty breathing, pulmonary edema, respiratory failure, tachycardia and hypotension, dizziness and or death. * The available evidence for reproductive effects in animals suggests that they are not likely in humans under normal conditions. No evidence is available to support teratogenic effects in humans or to support the ability of aluminum phosphide to cause mutations or increase mutation rates. * There is no evidence of aluminum phosphide having a negative impact on soil or ground water. It breaks down spontaneously in the presence of water to form a gaseous product, thus is non-persistent and non-mobile in soil and poses no risk to groundwater. For the same reasons, it is unlikely that aluminum phosphide or phosphine will contaminate surface waters. * The USEPA has determined that uses of aluminum phosphide will not generally cause unreasonable adverse effects to humans or the environment if used in accordance with the approved use directions and revised precautionary statements prescribed by the registration standard. Requirements for acute toxicity data have been waived because of the well-known extreme inhalation toxicity of phosphine gas, which it generates. Accordingly, aluminum phosphide has been placed in toxicity category I, the highest toxicity category.   Tolerances have been established for raw agricultural commodities at a level of 0.1 ppm (40 CFR 180.225); processed foods 0.01 ppm (21 CFR 193.20); and animal feeds 0.1 ppm (40 CFR 561.40). Finished food and feed must be held and aerated 48 hours prior to being offered to the consumer.  Via the Fumigation Management Plan, the SUAP requires that fumigation follow acceptable technical practices specified in Annex A-3 on BEST MANAGEMENT PRACTICES of the Fumigation PEA. These include, among others, use of appropriate personal protection equipment, including respirators, maintenance of an exclusion zone that only fumigation personnel can enter for duration of the fumigation (7-10 days or more), and phosphine gas monitoring for efficacy and hazard.  \*<http://pmep.cce.cornell.edu/profiles/extoxnet/24d-captan/aluminum-phosphide-ext.html> | |
| **(f) Effectiveness of the requested pesticide for the proposed use.** | | Aluminum Phosphide is registered by US EPA as stored grain pesticide. It is considered the most effective method of controlling stored commodity pests, especially when used in an IPM framework, as described above in (c).  In-country experience is that this fumigant is very effective in killing the intended targets noted in section 3 within the prescribed seven to ten day fumigation time.  Describe any resistance reported or known to you. If none, “We are not aware of any instances of resistance to aluminum phosphide by the intended target pests.” | |
| (**g) Compatibility of the proposed pesticide use with target and non- target ecosystems.** | | As an indoor fumigant, aluminum phosphide presents risks to fumigators and those working or living nearby, but there is not a “target ecosystem” of concern.  Indoor use, non-persistence and non-mobility in soil, negligible potential to contaminate surface waters, and a short half-life in air of ~5 hrs (daylight) mean that aluminum phosphide has essentially no interaction with or impact on non-target ecosystems. | |
| **(h) The conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils** | | As noted, aluminum phosphide will be used solely for indoor fumigation of warehoused food commodities: Briefly describe the warehouse(s) in which fumigation will occur, their setting, proximity to other structures & their uses.  Indoor use, non-persistence and non-mobility in soil, and negligible potential to contaminate surface waters (see “factor e,” analysis, above) mean that geography, hydrology and soils have negligible bearing on safety, efficacy or appropriateness.  Climate is relevant only in that extremely dry air can retard formation of phosphine gas from phosphine tablets, requiring appropriate adjustments to fumigation protocols. This is/is not anticipated to be an issue in XXX, where typical indoor temperatures will range between X°C & Y°C and humidity between X and Y%. | |
| **(i) The availability and effectiveness of other pesticides or nonchemical control methods** | | The fumigation PEA assesses the effectiveness and availability of non-chemical control methods, including weekly inspection for signs of rodents, weeding the perimeter around the warehouse, cleaning up spills and trash, ensuring that the warehouse doors, roofs, walls etc. are in good condition (Refer to the IPM section of Annex A-10). As noted, the Safer Use Action Plan requires good housekeeping IPM measures such as daily sanitation of the warehouse and weekly clearing of warehouse surroundings of weeds; daily inspections for pests and strictly adhering to the first in first out (FIFO) rule to minimize the storage time of the commodities in the warehouse.  The complementary contact pesticide [insert name] will be used to kill insects escaping fumigation and prevent re-infestation of the commodity. As documented by the PEA, such complementary use of contact pesticide(s) in and around warehouses is usually an integral part of the fumigation process. | |
| **(j) The requesting country's ability to regulate or control the distribution, storage, use and disposal of the requested pesticide** | | Partner country registration status is documented under Factor A, above.  Note whether phosphine fumigation requires a license in your partner country, and the requirements for obtaining such a license. Note whether such licensing is meaningfully enforced. | |
| **(k) The provisions made for training of users and applicators** | | Regardless of partner country licensing, describe the training standard of fumigator service provider personnel. | |
| **(l) The provisions made for monitoring the use and effectiveness of the pesticide** | | The SUAP requires a Fumigation Management Plan that serves as detailed log of each fumigation episode. The FMP requires efficacy monitoring of phosphine gas concentrations to better assure that required concentrations are attained for the required period. This is critical to the efficacy of the individual fumigation and to preventing emergence of resistance. Monitoring of commodities for infestation is a routine element of program management; quick re-infestations are the primary indicator that fumigation is ineffective. | |

| FACTOR ANALYSIS FOR | | | [INSERT NAME OF CONTACT PESTICIDE] |
| --- | --- | --- | --- |
| **ANALYSIS FACTOR** | | **ANALYSIS** | |
| **(a) USEPA registration status of the proposed pesticide.**  **Partner country registration status** | | Provide EPA registration status. Note that the pesticide must be registered for the same or similar uses by US EPA. | |
| **(b) Basis for selection of the pesticide** | | Availability, cost, efficacy, and relatively low toxicity to humans and non-target organisms should be key selection factors. | |
| **(c) Extent to which the proposed pesticide use is, or could be, part of an IPM program** | | The Safer Use Action Plan (SUAP) requires compliance with the IPM section of Annex A-10 of the Fumigation PEA. This checklist contains good-housekeeping based Integrated Pest Management (IPM) practices that are essential complements to fumigation, including daily sanitation of the warehouse; clearing warehouse surroundings of weeds on a weekly basis; daily inspections for pests; and strictly adhering to the first in first out (FIFO) rule to minimize the storage time of the commodities in the warehouse.  (List any additional IPM food commodity protection practices to which the program is committing. ) | |
| **(d) Proposed method or methods of application, including the availability of application and safety equipment** |  | |
| **(e) Any acute and long-term toxicological hazards, either human or environmental, associated with the proposed use, and measures available to minimize such hazards.** | |  | |
| **(f) Effectiveness of the requested pesticide for the proposed use.** | Describe any resistance reported or known to you. | |
| **(g) Compatibility of the proposed pesticide use with target and non-target ecosystems.** | |  | |
| **(h) The conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils** | This pesticide will be used solely for spraying the interior and immediate perimeter of empty warehouses. The settings for these warehouses are described under the factor analysis for aluminum phosphide, above.  Follow with additional relevant information. | |
| **(i) The availability**  **and effectiveness of other pesticides or nonchemical control methods** | The fumigation PEA assesses the effectiveness and availability of non-chemical control methods. As noted, the Safer Use Action Plan requires good housekeeping IPM measures such as daily sanitation of the warehouse and weekly clearing of warehouse surroundings of weeds; daily inspections for pests and strictly adhering to the first in first out (FIFO) rule to minimize the storage time of the commodities in the warehouse. | |
|  | | The complementary contact pesticide [insert name] will be used to kill insects escaping fumigation and prevent re-infestation of the commodity. As documented by the PEA, such complementary use of contact pesticide in and around warehouses is usually an integral part of the fumigation process. | |
| **(j) The requesting country's ability to regulate or control the distribution, storage, use and disposal of the requested pesticide** | | Partner country registration status is documented under Factor A, above. XXX does/does not have | |
| **(k) The provisions made for training of users and applicators** | |  | |
| **(l) The provisions made for monitoring the use and effectiveness of the pesticide** | |  | |

6. FINDINGS

In consequence of the analysis above, and the referenced Fumigation PEA, warehouse food commodity phosphine fumigation for program name food commodities and use of the complementary contact pesticides [insert name(s)] is [are] recommended for approval subject to full compliance with and implementation of the Safer Use Action Plan (SUAP) that constitutes the following section. The SUAP imposes on program name phosphine fumigation and complementary contact pesticide use the mitigation measures established by the Fumigation PEA.

In summary, these conditions are:

1. **Implementation of good-housekeeping IPM Measures that are essential complements to fumigation per** Annex A-11 on“PHOSPHINE FUMIGATION SERVICES CONTRACT”.
2. **Implementation of a Fumigation Management Plan** for each fumigation event substantively conforming to the plan provided as Annex A-10 “FUMIGATION MANAGEMENT PLAN (FMP) FOR PHOSPHINE FUMIGATION OF FOOD COMMODITIES IN SHEETED STACKS” to the Fumigation PEA.[[8]](#footnote-8)
3. **Complementary Use of Contact Pesticid**es will (1) be limited to the pesticide(s) authorized by this PERSUAP and substantively conform to contact pesticide best practices as set out in the IPM section of Annex A-10 of the Fumigation PEA.[[9]](#footnote-9)
4. **Storage and Transport of Aluminum Phosphide and Contact Pesticides, if under program control,** will substantively conform to contact pesticide best practices as set out in the IPM section of Annex A-10 of the Fumigation PEA, EXCEPT for changes specified below and/or subsequently approved by the USAID Bureau for Democracy, Conflict and Humanitarian Assistance (DCHA) Bureau Environmental Officer (BEO).
5. Food and feed commodities that have been fumigated with phosphine must be held and aerated for 48 hours prior to distribution.
6. **Monitoring and Corrective Actions.** Program will actively monitor compliance with above-listed conditions and undertake corrective actions as needed.

Formally, upon approval of this PERSUAP, the program name IEE is amended so that phosphine fumigation activities receive a 22 CFR 216 **negative determination** subject to the **condition** of compliance with the SUAP provided below.

1. SAFER USE ACTION PLAN (SUAP)

The SUAP is provided as a mandatory “**safer use action plan and compliance tracker**” form. This form both enumerates safer use requirements and sets out how program name will implement these requirements. Additionally, it serves as a compliance tracking and reporting tool, and will be submitted annually with regular reporting requirements.

*Note: with respect to fumigation, the Safer Use Action Plan satisfies the requirement for an environmental mitigation and monitoring plan (EMMP). The program EMMP should simply incorporate the SUAP by reference*

[INSERT USAID PROGRAM NAME]

FUMIGATION SAFER USE ACTION PLAN

Completion of this form is an integral part of the PERSUAP and must be submitted annually with regular reporting requirements.

|  |  |
| --- | --- |
| **PROGRAM & CONTACT INFORMATION** | |
| **Awardee** |  |
| **Program Name** |  |
| **Fumigation Compliance Lead** | *Name and title* |
| **Contact Information** | *Email & telephone* |

|  |  |
| --- | --- |
| **DATE OF ANNUAL REPORTING SUBMISSION:** | |
| **Annual Update #1** |  |
| **Annual Update #2** |  |
| **Annual Update #3** |  |
| **Annual Update #4** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **FUMIGATION LOG (record all fumigation events since the last annual update)** | | | | | | |
| **Dates** | **Location (Town or City)** | **Warehouse Type** | | | **Commodity & Quantity Fumigated** | **Key Exceptions/Incidents per FMP log.** |
| **P\*** | **S\*** | **T\*** |
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*P=Primary, S=Secondary, T=Tertiary*

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| --- | --- |
| **REQUIRED COMPLIANCE MEASURES** | **STATUS OF COMPLIANCE ACTIONS**  **(Place an X where applicable)** |
| 1. Good Housekeeping IPM Measures are implemented. | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |
| 2. A Fumigation Management Plan is implemented, with the required gas monitoring equipment, PPE and gas impermeable tarps for fumigation. | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |
| 3. The Use of Contact Pesticides is limited to pesticides authorized in this PERSUAP, and proper application, safety measures and PPE requirements are equally followed. | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |
| 4. Best practices in the storage and transport of Aluminum Phosphide and contact Pesticides are carried out. | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |
| 5. The third-party Fumigation Service Provider, if used, is in compliance with specified safer use practices | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |
| 6. Compliance monitoring and implementation of corrective actions | □ Yes □ No  If “No”, please explain why, and detail when compliance is expected to take place: |

**REQUESTED EXCEPTIONS AND CHANGES TO SPECIFIED MANAGEMENT PRACTICES**

Enter here specific requested exceptions or changes to fumigation practices as described in the Fumigation Management Plan (Annex a-10) or storage, transport, and contact pesticide practices per the IPM section of Annex A-10. Reference by number & provide justification in each case. Alternately, a strike-through edit of the FMP may be submitted.

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(insert extra rows if needed)

Annex 4: FMP Template

Adapted from: ANNEX A-10 TEMPLATE: Fumigation Management Plan (FMP) Fore Phosphine Fumigation of Food Commodities in Sheeted Stacks

**About FMPs:** Fumigation Management Plans (FMPs) are widely recognized fumigation good practice, and are mandatory in the US. They are written documents that provide specific logistical, performance and contact information to better assure that fumigation follows systemic planning and execution for efficacy and safety.

**FMP Requirements for USAID Partners:** As described in the Overview, fumigation compliance requires USAID partners to complete a Fumigation Management Plan (FMP) for EACH fumigation event, and to keep these FMPs on file for 2 years. Compliance further requires that the plan and the fumigation event itself substantively confirm with the FMP template that follows. **In areas where Partners make substantial changes to the FMP template provided herein, they must submit the proposed changes to USAID for approval.**

**Modifying this template:** USAID partners must review this FMP template for compliance with local requirements and adjust accordingly. Other adjustments to local circumstances and capabilities are possible. *However*, any substantive changes must be requested in the USAID Program’s PERSUAP (the template for which is provided as Annex A-9 to this PEA) or subsequently in writing to the Program’s AOR, who will forward for clearance to the relevant Bureau Environmental Officer.

**Purposes of this FMP template.** This FMP template is NOT:

* A substitute for training in phosphine fumigation.
* A how-to manual for phosphine fumigation.
* Applicable without significant modifications to the fumigation of whole structures, containers, or vehicles.

This FMP template IS intended to very substantially reduce the effort required by USAID partners to develop a compliant FMP, and to conduct compliant (and therefore safer and more effective) fumigation of food commodities in sheeted stacks.

More specifically, this FMP template is a succinct summary of acceptable technical practice for phosphine fumigation of USAID-funded Food Commodities in sheeted stacks in a form that: (1) guides a trained fumigator to produce safe and efficacious results, (2) allows a USAID partner to better oversee their fumigation services provider; and (3) supports fumigation compliance reporting required by USAID Program PERSUAPs.

This template FMP embodies the acceptable technical practices for fumigation set out in Annexes A-7 and A-11.

**Key sources**:

van Someran Graver, J. E. 2004. *Guide to Fumigation Under Gas-Proof Sheets*. Food and Agriculture Organization of the United Nations. Produced by the Australian Centre for International Agricultural Research, Canberra, Australia. Available at e- book; includes accompanying videos) and http://[http://aciar.gov.au/files/node/543/FAO%20full%20text.pdf (print-ready](http://aciar.gov.au/files/node/543/FAO%20full%20text.pdf(print-ready) PDF).

“Standard Operating Procedure for Contractors Undertaking Phosphine Fumigation and Insecticide Spraying in WFP Stores” (Nov 2003 revision). World Food Program. Available at: [http://documents.wfp.org/stellent/groups/public/documents/manual\_guide\_proced/wfp254885.pdf.](http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp254885.pdf)

“North Dakota Fumigation Management Plan Intermediate to Large Operations” North Dakota State University Department of Agriculture. Available at <http://www.ag.ndsu.nodak.edu/aginfo/pesticid/pdf/fum/FMP%20int-lg.pdf>

Proper Disposal of Animal Carcasses in Michigan: An Industry Guide to the Bodies of Dead Animals Act. Michigan Department of Agriculture, Lansing, Michigan. Available at :[http://www.michigan.gov/documents/MDA\_BODA\_80099\_7.pdf.](http://www.michigan.gov/documents/MDA_BODA_80099_7.pdf)

Rodent Control: How to Use Rodent Traps and Bait Stations. Public Health Seattle & King County. Environmental Health Services, Seattle, Washington. Available at : [www.kingcounty.gov/healthservices/health/ehs/~/ ./RatTraps.ashx.](http://www.kingcounty.gov/healthservices/health/ehs/%7E/./RatTraps.ashx)

Dead Animal Disposal. Indiana State Board of Animal Health. Available at [http://www.in.gov/boah/2369.htm.](http://www.in.gov/boah/2369.htm)

USAID Food Assistance Program Name:

**PHOSPHINE FUMIGATION MANAGEMENT PLAN (FMP) (sheeted stacks only)**

This FMP template provides a step-by-step process to ensure safe and effective fumigation and train fumigation personnel

**Commodity and Ownership**

|  |  |
| --- | --- |
| **Planned Fumigation Dates:** |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A. OVERALL PROGRAM & CONTACT INFORMATION** | |  | **ATTENTION:**  **To ensure full safety and efficacy, completion of this FMP  is mandatory for each fumigation event.\***  **\*Some information may remain the same across fumigation events.** |  |
| Lead Awardee |  |  |  |
| Program Name |  |  |  |
| Fumigation Compliance Lead |  |  |  |
| Information |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **B. FACILITY INFORMATION** | |  | **C. FUMIGATOR INFORMATION** | |
| Name of Facility |  |  | Lead Fumigator |  |
| Location |  |  | Organization |  |
| Responsible Manager *(Name, Organization & Title* ) |  |  | Contact Information |  |
| Information |  |  | Expiration Date (if any) |  |

| **D. COMMODITY TO BE FUMIGATED** | |  | **E. FUMIGANT PRODUCT INFO & DOSAGE** | |
| --- | --- | --- | --- | --- |
| Commodity(ies) & Amount in tons (est) *(e.g. maize 200mt)* |  |  | E1. Fumigant product name/description) |  |
|  | E2. Ambient Temp (*expected indoor temp range)* |  |
| Owner of Commodity |  |  | E3. Quantity Required |  |
| How Commodity is Packaged |  |  | E4. Required Time @ Concentration\* *(e.g. 7 days @ 200ppm)* |  |
| # of Stacks & Size *(e.g., 4 stacks 3m X 2m X 2m)* |  |  | E5. Planned Downtime\**(days + hours, includes aeration.)* |  |
| Last Fumigation | *Enter date if known. Otherwise, enter “unknown”* |  | \***REQUIRED**:  Document calculations E3, E4 & E5  in Annex #A. note that effective phosphine fumigation typically requires 7-10 days. | |
| Condition | *Moldy? Visibly infested?* |
| Moisture % |  |
| Purpose of Fumigation |  |

**Emergency Planning and Safety**

|  |  |  |
| --- | --- | --- |
| **F. CONTACT INFORMATION: MEDICAL FACILITY, EMERGENCY RESPONSE AUTHORITIES** | | |
|  | Location | Telephone |
| Police |  |  |
| Fire Service |  |  |
| Clinic/Hospital |  |  |
| Other Local Authority (specify Port Authority, District Council, Chieftaincy, etc.) |  |  |
| Pesticide Regulatory Authority |  |  |
| Chief of Party (or commodity point of contact) |  |  |

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| --- |
| **G1. ADVANCE NOTIFICATION PLAN FOR ABUTTERS**  Specify the procedures for notifying those living and working within 100m of the facility. The fumigation team needs to alert relevant entities, particularly households, about fumigation activities. |
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| **G2. ADVANCE NOTIFICATION PLAN FOR LOCAL AUTHORITIES**  Specify the procedure for notifying local authorities, as required or agreed with these authorities. |
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| **H. EMERGENCY RESPONSE PLAN**  Describe the procedure to be followed if phosphine concentrations exceed (1) 0.3ppm (or local TLV, if more stringent), or (2) 1 ppm (or local STEL, if more stringent) (TLV= threshold limit value; STEL = short term exposure limit. See PEA Annex A-3. |
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| --- | --- | --- | --- |
| **I. FUMIGATION PLAN & EXCLUSION ZONE** | | | |
| Required Action: | Y | N | Confirming Initials |
| I1. Obtain plot or make scale sketch **map** of facility and surroundings. (note grid paper is provided as final page of this template) |  |  |  |
| I2. Mark **locations of stacks** to be fumigated. |  |  |  |
| I3. On plot, mark **exclusion zone** that maintains at least a 6M perimeter from stacks to be fumigated, and which INCLUDES buildings or rooms with walls common to the room in which the stack is being fumigated. An exception must be requested if the exclusion zone cannot be maintained. |  |  |  |
| I4. Determine if a **watchman** or watchmen will be required to maintain the exclusion zone. If yes, inform the facility manager immediately. |  |  |  |
| I5. On plot, mark **shut-off points** for electricity, water, gas, if any. |  |  |  |
| I6. On plot mark doors/gates to be secured to enforce exclusion zone and locations of **warning signs** to be posted. |  |  |  |
| I7. On plot, mark locations of **hazard monitoring** (at least 3 locations just outside exclusion zone, where gas is mostly likely to accumulate). |  |  |  |
| I8. On plot, mark locations of **phosphine trays** and monitoring lines. |  |  |  |
| I9. Attach plot to this Fumigation Management Plan as Annex #F |  |  |  |

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| --- | --- | --- | --- |
| **J. COMMUNICATION AND TRAINING** | | | |
| Required Actions | Y | N | Confirming Initials |
| J1. Fumigation team reviews **product label**, MSDS, and applicator/product manual. Lead applicator provides detailed verbal briefing if required. |  |  |  |
| J2. Lead applicator briefs the team regarding the symptoms of **phosphine poisoning** and first aid. (See Fumigation PEA Annex A-8) |  |  |  |
| J3. Lead applicator briefs the team regarding the planned **fumigation process** with reference to the site plot (I10) WITH FACILITY MANAGER PRESENT |  |  |  |
| J4. Lead applicator briefs the team & facility manager on EMERGENCY RESPONSE PLAN (H1) & roles and responsibilities for implementing the plan are agreed. |  |  |  |
| J5. All employees engaged in fumigation instructed on the use, impact, and mitigation measures of phosphine fumigation. |  |  |  |

**Equipment and Supplies**

|  |  |
| --- | --- |
| **K. NUMBER OF SHEETS, SAND SNAKES AND TRAYS REQUIRED** | |
| Required Action: | Quantity Required |
| K1. Determine **number of fumigation sheets** required (note that joining sheets requires a 1(one) meter overlap, tightly rolled & then clipped or weighted. If clips are used, they must be applied every 20cm.)  (*Indicate number & size of sheets, standard 18meterX12meter sheets preferred)* |  |
| K2. Determine **length of sand snakes** required (double rows must be used) *(in meters)* |  |
| K3. Determine number of **phosphine tablet trays** required |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **L. CONDITION, QUANTITY & ADEQUACY OF EQUIPMENT & SUPPLIES** | | | |
| **Fumigation may NOT proceed unless ALL answers are “YES”** | | | |
| Confirm that: | Y | N | Confirming Initials |
| L1. Required quantity of sheets (K1) meeting specifications (M1) are available |  |  |  |
| L2. Required length of sand snakes (K2) are available |  |  |  |
| L3. Required number of tablet trays (K3) are available |  |  |  |
| L4. **Respiratory equipment and protective gear** meeting specifications (M2) are available FOR THE FULL TEAM and all personnel can achieve a complete face seal. No one enters the fumigation area without protective gear. |  |  |  |
| L5. (1) Dry, clean cotton gloves in good condition; (2) rubber boots; (3) liquid-tight coveralls are available FOR THE FULL TEAM |  |  |  |
| L6. **Detection (monitoring) equipment** meeting specifications (M3) is available to monitor HAZARD |  |  |  |
| L7. Detection (monitoring) equipment meeting specifications (M3) is available to monitor EFFICACY |  |  |  |
| L8. **Warning signs** (placards) IN APPROPRIATE LANGUAGES and WITH APPROPRIATE PICTOGRAMS and compliant with host country regulations (if any) are available in quantity required by plot (I6) |  |  |  |
| L9. Required quantity of fumigant (E3) is available |  |  |  |

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| --- |
| **M. SPECIFICATIONS FOR SHEETS, RESPIRATORY & DETECTION EQUIPMENT** |
| M1. Fumigation Sheets |
| **Sheets must be**:   * resistant to ultraviolet light * tear-resistant along BOTH length and width * of material impermeable to phosphine (gas loss must be less than 1 mg/day/m2 * in good condition with ALL holes and tears mended with material-specific adhesive and patch. * light enough to carry (200-250g/m2) a full standard-size (18mX12m) sheet   250-micron (0.25mm) thickness PVC sheet, PVC on a nylon or terylene scrim, or multi-layer thin-film laminates are all acceptable.  Thin coatings on widely woven materials and annealed polypropylene sheets NOT acceptable. |
| M2. Respiratory Protection |
| Properly maintained **canister-type full facemask respirator**. The canister must (1) be rated to protect against phosphine, (2) not expired, (3) not damaged, and (4) canisters previously used must not be opened more than 6 months ago & not have exceeded their rated time-in-use.  OR  Properly maintained self-contained breathing apparatus.(SCBA)  Other varieties of respiratory protection may be acceptable, see PEA Annex A-3. NOTE. Canister/cartridge type respirators are NOT adequate to enter a fumigation enclosure (e.g. go into a sheeted container) |
| M3. Monitoring Equipment |
| All equipment must be properly **calibrated and maintained**. Detector tubes, if used, must NOT be expired. Efficacy monitoring equipment must be able to read in the 200-500ppm + range. Hazard monitoring equipment must be able to accurately read in over the 0.3-3ppm + range.  See PEA Annex T-9 for more information |

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| --- | --- | --- | --- |
| **N. RESPIRATORY AND DETECTION EQUIPMENT** | | | |
| Required Action: Complete log of all Respiratory and Detection Equipment. | | | |
| Description *e.g., Canister Respirator* | Manufacturer & Model # | Manufacture Date (If Known) | Serial Number |
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*\*Note: advance notice of 24 or more hours may be required by country laws or regulations.*

**Application and Monitoring**

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| --- | --- | --- | --- |
| **O. SUITABILITY OF FACILITY, STACKS AND TEAM FOR FUMIGATION** | | | |
| By following these steps, manadatory fumigation will be safe and effective.  **Fumigation may NOT proceed unless ALL criteria are met.** | | | |
| Mandatory steps. Confirm that: | Criterion Is… | | Confirming Initials |
| Met | Not Met |
| O1. Commodities being fumigated are not required for use before the end of the **planned down time** (E5) + 1 day |  |  |  |
| O2. Expected **temperature** during the fumigation period will be 15⁰C or above. |  |  |  |
| O3. Stacks are NOT built around pillars or against walls, and that there is **sufficient clearance** (1m) around each stack to effectively sheet and seal. |  |  |  |
| O4. **Surface issues**: EITHER (1) the floor under and for 1 (one) meter around stack is crack-free concrete OR (2) the stack is placed on top of intact fumigation tarps. (If multiple tarps are used, they must be joined by tightly rolling a 1m overlap & weighting or clipping the join). |  |  |  |
| O5. The marked exclusion zone (see I3) can be maintained for the **duration of the fumigation** (7-10 days or more). (Exclusion = no people EXCEPT for fumigation personnel with proper breathing equipment in this zone.) |  |  |  |
| O6. A trained 2-person (or larger) team is available for application of fumigant and aeration and the team holds any required country licenses. |  |  |  |
| O7. If watchmen are required to maintain the exclusion zone, they will be available over the entirety of the fumigation period, including aeration time. |  |  |  |
| O8. The warehouse contains only the commodity to be fumigated. |  |  |  |

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| --- | --- | --- | --- |
| **P. WARNING SIGNAGE AND SECURITY** | | | |
| Required Actions | Y | N | Confirming Initials |
| P1. Notify Abutters per Notification Plan (G1). In particular, ensure that nearby residents have been informed of activity, |  |  |  |
| P2. Notify Workers and any others with customary access to the exclusion zone. Brief on emergency response plan (H1) |  |  |  |
| P3. If applicable, execute Local Authorities Notification Plan (G2)\* |  |  |  |
| P4. Post warning signage at all points indicated by fumigation plot (I6) |  |  |  |
| P5. Assure that doors are ready to be locked. (Locks and keys available) |  |  |  |
| P6. Assure that watchmen are on-site, if required to maintain the exclusion zone. |  |  |  |

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| **Q. PLACING SHEETING AND COVERING STACKS** | | | |
| Required Actions **IN EXACTLY THIS ORDER** | Y | N | Confirming Initials |
| Q1.Position sheets. Carry, do not drag the sheets into position |  |  |  |
| Q2. Cover stacks. Unfold the sheets towards the stack. Place the sheet over the stack and position with 1 (one) meter of sheet lying on the ground. Unroll the sheet to cover the entire stack. If more than one sheet is used, join the sheets. Joins require a 1(one) m overlap, tightly rolled, and then clipped every 20cm or weighted. |  |  |  |
| Q3. Set sand snakes. Smooth out any wrinkles and folds in sheets, and then place two rows of sand snakes on the sheets along the sides of the stack. Ensure that a good seal is achieved along the whole length and take special care at the corners. |  |  |  |
| Q4. Place monitoring lines. Place two monitoring lines from the top and one from the bottom of each stack for efficacy monitoring. Cut small holes to insert tubes and seal holes in gas sheets with tape. Gas monitoring lines should extend outside of the exclusion area. Place duct tape over the free tube ends, except when measuring gas concentrations. Tubes MAY NOT be located near placement positions for phosphine tablets. |  |  |  |

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| **R. APPLYING FUMIGANT** | | | |
| **ATTENTION:** phosphine gas begins forming as soon as the air-tight packaging of phosphide pellets/tablets is opened. It is a deadly poison. It is flammable. Contact of phosphide with water will cause fire or explosion. Smell is NOT a reliable indicator of danger. | | | |
| Required Actions **IN EXACTLY THIS ORDER** | Y | N | Confirming Initials |
| R1. Watchmen go on duty (if required to maintain the exclusion zone) & remain OUTSIDE the zone until aeration is complete (W9) |  |  |  |
| R2. Verify ONLY personnel involved in fumigation are in the exclusion zone |  |  |  |
| R3. Turn off electric lights & any sources of sparks |  |  |  |
| R4. Ensure that all fumigation personnel are wearing PPE, including respirators, as per L4 & L5 |  |  |  |
| R5. Lay out the trays for aluminum phosphide tablets/pellets around the stack. Remove the sand snakes that hold down the sheets next to the trays. |  |  |  |
| R6. Distribute UNOPENED tablets/sachets next to the trays |  |  |  |
| R7. Position tablets/pellets in a single layer on each tray. To avoid fire risk, do not pile tablets or pellets. Slide trays under the sheets and replace the sand snakes. To minimize worker exposure to gas being released, placement of trays should be completed within 15 minutes. Work from the back of the stack towards the exit doors. Pellets may NOT touch bagged commodities. |  |  |  |
| R8. Assure all opened tablets/pellets are used |  |  |  |
| R9. Leave the warehouse and lock ALL doors |  |  |  |

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| **S. MONITOR GAS CONCENTRATIONS FOR EFFICACY AND HAZARD & LOG RESULTS** | | | |
| Required Actions | Y | N | Confirming Initials |
| S1. Hazard Monitoring. 1 hour, 2 hours, 4 hours & 24 hours after applying fumigant, and every 24 hours thereafter, monitor for hazard at all points designated on the fumigation plot (I7). Record results on attached log (#D). |  |  |  |
| S2. Hazard Monitoring Response. If concentrations exceed 0.3ppm (or the local TLV,\* if more stringent), assure that individuals move through the area only in passing. If concentrations exceed 1.0ppm (or the local STEL, if more stringent) evacuate the area. NOTE ANY SUCH ACTIONS IN EXCEPTIONS LOG (#C). |  |  |  |
| S3. Efficacy Monitoring: Monitor EACH monitoring line 24 hours after fumigation application; every 24 hours thereafter. Monitor within stacks to confirm it was an effective fumigation application. Record results in attached logsheet (#E). NOTE ANY EXCEPTIONS IN LOG. |  |  |  |
| S4. Efficacy Monitoring Response. If concentration does not reach or falls below 200ppm before additional fumigant may be added IF SCBA apparatus are used. NOTE ANY SUCH ACTIONS IN EXCEPTIONS LOG (#C). |  |  |  |

*\*threshold limit value. \*\*short-term exposure limit see PEA Annex T-9.*

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| **T. CERTIFY FUMIGATION COMPLETE OR ABORTED** | | |
| Required: Certify which of the following applies. | ✓ | Req’d Time @ Concentration *e.g. 200 ppm @ 7 days* |
| T1. Efficacy monitoring results show that the required phosphine gas concentration was sustained over the required period in each stack |  | (Copy from E4) |
| T2. Efficacy monitoring results show that the required concentration was NOT sustained over the required period in one or more stacks. |  |

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| **U. AERATE** | | | |
| Required Actions **IN EXACTLY THIS ORDER** | Y | N | Confirming Initials |
| U1. Fumigation team puts on respirators and other PPE per L4 and L5 before entering exclusion zone. |  |  |  |
| U2. Open all doors and ventilators. Turn on fans, if any. |  |  |  |
| U3. Remove sand snakes from the corners of up to 2 stacks so that sheet covering each can be lifted. (If the stacks are large relative to the size of the room, ONLY 1 stack can be opened at a time.) |  |  |  |
| U4. Pull the free corner of each sheet up to the top of the stack with a rope. Team leaves exclusion zone immediately. |  |  |  |
| U5. Allow gas to leave stack and warehouse for a half-day to 1 day |  |  |  |
| U6. Repeat U1, U4 & U5 until remaining stacks are opened |  |  |  |
| U7. Repeat U1. Then completely remove all sheets covering stacks. |  |  |  |
| U8. Monitor inside warehouse and directly next to stack until phosphine gas concentration is less than 0.3 ppm (or local TLV value, if more stringent.) |  |  |  |
| U9. ONLY AFTER CONCENTRATION IS LESS than 0.3 ppm (or local TLV value, if more stringent), lead fumigator informs facility manager that the area is safe to enter. |  |  |  |

**Disposal and Cleanup**

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| **V. ALUMINUM PHOSPHIDE RESIDUE REMOVAL & DISPOSAL** | | | |
| **ATTENTION:** Residues contain 3-5% unreacted materials and are hazardous to breathe and touch!  **ATTENTION:** Never dispose of unused tablets/pellets with these methods. Never place unused pellets/tablets in a drum with or without detergent as a fire or explosion may occur. | | | |
| Required Actions | Y | N | Confirming Initials |
| V1. Personnel involved put on respirators and other PPE per L4 & L5. |  |  |  |
| V2. Collect residue from trays in bucket or drum. Do not allow any residue to touch food commodity |  |  |  |
| V3. Remove residue to a safe outdoor area |  |  |  |
| V4. Remove warning signs & stand down watchmen |  |  |  |
| V5. Standing upwind to avoid any evolved phosphine, mix residue slowly into soapy water, assuring the residue is fully reacted. |  |  |  |
| V6. After any reaction is complete, dispose of mixture in a 0.5m deep disposal pit, at least 100m away from warehouse structures. Fill in hole. |  |  |  |

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| **W. CLEAN-UP** | | | |
| **ATTENTION:** Dead animals should be considered a biohazard &  must be disposed as soon as possible after aeration is complete | | | |
| Required Actions | Y | N | Confirming Initials |
| W1. Crush empty phosphide tablet/pellets containers and dispose per host country requirements. If none, bury. |  |  |  |
| W2. Inspect entire warehouse with flashlight, including under pallets and under-roof area for dead rodents and birds |  |  |  |
| W3. Collect all dead animals wearing disposable gloves (if available). If not available, pick up with shovel or inside-out plastic bag. |  |  |  |
| W4. Dispose of carcasses by (1) burying, wrapped in newspaper or plastic bag 0.6-1.2m deep and at least 60m from any shallow well or surface water; OR (2) burning, where it will not cause a public nuisance and in accordance with local laws; or (3) otherwise in accordance with local laws. |  |  |  |
| W5. Wash hands thoroughly with soap. |  |  |  |

**Annexed Logs and Documentation**

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| **#A. DOCUMENTATION OF DOSAGE CALCULATION**  Document the calculations/information used to determine the quantity of fumigant required and the “time @ concentration” efficacy threshold (e.g. 200 ppm @ 7 days) | |
| *General recommendation is 3 ALP tablets/metric ton but will vary with commodity, temperature & moisture content. 6 tablets/metric ton may be needed for highly sorptive commodities such as paddy rice, brown rice & pulses. Consult product label.* | |
| **#B. FUMIGATION TIME LOG** | |
| #B1. Planned down time (days + hrs) (from H5) |  |
| #B2. Fumigant Applied (*Date & Time)* |  |
| #B3. Efficacy Reached (*Day & Time that H4 is achieved)* |  |
| #B4. Aeration Start (*Date & Time)* |  |
| #B5. All-Clear Given (see V9) (*Date & Time)* |  |

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| **#C. ISSUES, INCIDENTS AND EXCEPTIONS LOG** | | | | | | | | | | | | |
| Log here any issues, incidents or exceptions that arise during the fumigation, including but not limited to phosphine concentrations > TLV outside the exclusion zone, violations of the exclusion zone, known or suspected problems with PPE discovered after the initial inspection, members of the fumigation team who become ill, addition of fumigant to reach or sustain required concentrations, etc. | | | | | | | | | | | | |
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| **#D. PHOSPHINE CONCENTRATION LOG: HAZARD MONITORING** | | | | | | | | | | | | |
| Per S1, log phosphine gas concentrations taken at designated locations outside the exclusion area, in ppm. | | | | | | | | | | | | |
| Location\* | Monitoring Time (time 0 = application of fumigant) | | | | | | | | | | | |
|  | 1 hr | 2 hr | 4 hr | 24 hr | 2 days | 3 days | 4 days | 5 days | 6 days | 7 days | 8 days | 9 days |
| A |  |  |  |  |  |  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |  |  |  |  |  |  |
| C |  |  |  |  |  |  |  |  |  |  |  |  |
| D |  |  |  |  |  |  |  |  |  |  |  |  |

\*As designated on plot map, Annex #F. Add locations as needed.

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| **#E. PHOSPHINE CONCENTRATION LOG: EFFICACY MONITORING** | | | | | | | | | | |
| Per S3, log phosphine gas concentrations taken from monitoring lines, in ppm. | | | | | | | | | | |
| Monitoring Line\* | Monitoring Time (time 0 = application of fumigant) | | | | | | | | | |
| 24 hrs | 2 days | 3 days | 4 days | 5 days | 6 days | 7 days | 8 days | 9 days | 10 days |
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |

\*As designated on plot map, Annex #F. Add lines as needed.

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| **#F. SCALE MAP/PLOT OF FACILITY AND SURROUNDINGS, SHOWING EXCLUSION ZONE** |

(use this grid for a sketch map, if a more formal site map is not available. See section I for requirements)

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Annex 5: List of External Materials

**Presentations**

Module 1\_Compliance.pptx

Module 2\_IPM Part 1.pptx

Module 2\_IPM Part 2.pptx

Module 2\_IPM Part 3.pptx

Module 3\_Fumigation Part 1.pptx

Module 3\_Fumigation Part 2.pptx

Module 3\_Fumigation Part 3.pptx

**Handouts**

**Workshop Design**

Pre- and Post-test Sample Questions.docx

Sample Two-Day Agenda for All 3 Modules.docx

Post Workshop Satisfaction Survey.docx

**Module 1: Pesticide Compliance**

Compliance HANDOUT.pdf

Activity 1.1

Activity 1.1\_Group 1.docx

Activity 1.1\_Group 2.docx

Activity 1.1\_Group 3.docx

Activity 1.1\_Group 4.docx

Guidelines for Fumigation Compliance Processes for USAID Partners.pdf

PERSUAP for Phosphine Template.docx

Activity 1.2

Activity 1.2\_Group 1.docx

Activity 1.2\_Group 2.docx

Activity 1.2\_Group 3.docx

Activity 1.2\_Group 4.docx

Activity 1.2\_Group 5.docx

Activity 1.2\_Group 6.docx

Fumigation Management Plan Template.docx

**Module 2: Integrated Pest Management**

IPM Part 1 HANDOUT.pdf

Activity 2.1

Activity 2.1\_IPM Methods.doc

Activity 2.1\_IPM Pyramid Cards.docx

Activity 2.2

Activity 2.2\_PART 1

Activity 2.2\_PART 2

IPM Practices & Inspection Checklist

IPM Part 2 HANDOUT.pdf

Insect\_Poster.pdf

Top 10 Stored-Product Insect Species.docx

Data Interpretation for Insect Trapping Programs.docx

IPM Part 3 HANDOUT.pdf

Activity 2.3\_Pesticides.docx

Residual Pesticide Best Management Practices.docx

**Module 3: Phosphine Fumigation**

Fumigation Part 1 HANDOUT.pdf

Activity 3.1\_Concepts Review Game.

Fumigation Part 2 HANDOUT.pdf

FMP Annexes.docx

Fumigation Part 3 HANDOUT.pdf

Annex A-6 Gas Monitoring & Respiratory Protection Equipment.pdf

Annex A-7 Guidelines for Phosphine Gas Exposure First Aid.pdf

Safe Disposal of Fumigation Containers.docx

**Videos**

**Module 3: Phosphine Fumigation**

GOOD\_PRACTICE\_for\_PHOSPHINE\_FUMIGATION\_(part\_1).mp4

GOOD\_PRACTICE\_for\_PHOSPHINE\_FUMIGATION\_(part\_2).mp4

1. Efficacy Monitoring\_Bellows Pump.mp4

2. Efficacy Monitoring\_Containers.mp4

3. Efficacy Monitoring\_Stacks.mp4

4. PPE Gloves.mp4

5. PPE Protective Clothing.mp4

6. PPE Dust Masks.mp4

7. PPE Respiratory Protection.mp4

8. PPE Gas Detection Equipment.mp4

9. PPE Electronic Safety Monitor.mp4

10. PPE Safety Gas Monitoring Recap.mp4

**Resources**

**Module 1: Pesticide Compliance**

EMMP FactSheet.pdf

USAID Phosphine Fumigation PEA Annex A TOOLS.pdf

Warehouse Staff Safety Guide 11-16-14.doc

1. Additional post-training support may be needed to fully achieve performance objectives. **Learning objectives**, on the other hand, describe what will be taught in a module. [↑](#footnote-ref-1)
2. PERSUAPs are 22 CFR 216 Initial Environmental Examination (IEE) amendments. They fulfill the analysis and safeguard requirements established by 22 CFR 216.3(b) for any use of pesticides in a USAID-funded or USAID-managed activity. [↑](#footnote-ref-2)
3. While this document refers to compliance processes that are specific to the DCHA Bureau programs, its requirements apply to all USAID programs involving fumigation of agriculture commodities. [↑](#footnote-ref-3)
4. Refer to the appropriate office: <http://www.usaid.gov/our_work/environment/compliance/environmental-> compliance-officers [↑](#footnote-ref-4)
5. Available on: http://www.usaidgems.org/fumigationpea.htm [↑](#footnote-ref-5)
6. It should be noted here that Phosphine Fumigation refers to fumigation with aluminum phosphide [↑](#footnote-ref-6)
7. There is some controversy over the optimal exposition time to respect from fumigating the warehouse to aerating it after the phosphine gas has dissipated, for efficient pest control. For any clarifications, please contact the DCHA BEO (eclesceri@usaid.gov) [↑](#footnote-ref-7)
8. EXCEPT as noted in the SUAP [↑](#footnote-ref-8)
9. Ibid. [↑](#footnote-ref-9)