# Environmental Sustainability of Agribusiness Projects

## Developing Environmental Profiles

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**Regional Agribusiness Project**
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# ENVIRONMENTAL SUSTAINABILITY OF AGRIBUSINESS PROJECTS

## DEVELOPING ENVIRONMENTAL PROFILES

by

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# PREFACE

To explore the relationship between agribusiness development and environmental sustainability, DPRA Incorporated, an environmental subcontractor on the Asia Regional Agribusiness Project (RAP), prepared this brief background paper to provide some guidance in environmental assessment to agribusiness projects funded by the U.S. Agency for International Development. The paper can also be used to expose projects' agribusiness clients to the issue of environmental sustainability.

Because many projects and their clients are hesitant to have comprehensive environmental impact assessments performed, beyond those minimally required by USAID and local governments, this paper outlines a simple, self-review approach that USAID agribusiness projects can use to confront, manage, and reduce environmental risk inherent in their own operations — with or without outside expertise. The basic approach suggested is the development of an environmental profile for the project. This paper describes the key components of an environmental profile and provides an example of internal checklists that need to be developed to reduce risk. In this case, the component chosen for the checklisting was pesticide management, an area of considerable importance to all the Asia agribusiness projects supported by RAP. Similarly, appropriate checklists might be prepared for fertilizer, soil, water, and waste stream management.

The paper has already been presented at seminars held by several of the Missions and has generated considerable discussion, some of which may lead to customized environmental assessments through RAP. The point is that the services of DPRA and other sources of RAP environmental expertise should not be seen as environmental policing. Rather, RAP can provide considerable assistance in the internal, self-review of environmental challenges to agribusinesses, to assist them in averting costly future environmental mishaps. Judicious management of environmental risk is a cornerstone to ensuring environmental sustainability. Internal commitment to environmental sustainability without outside assistance is far better than no internal commitment at all. However, RAP environmental experts have the knowledge to assist those who are truly committed to environmental sustainability in developing internal review programs that will be the most highly effective over the long term.

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# INTRODUCTION

The overall objectives of agricultural and agribusiness development projects funded by the U.S. Agency for International Development are to generate sustainable increases in employment and incomes of the participants and to ensure an adequate and continuing supply of products to consumers worldwide. Sustainable growth does not exhaust the resources of the host country or damage the economic, cultural, or natural environment. Rather, it creates enterprises and incomes that build a stronger, more viable society. Key to sustainable growth is addressing long-term environmental problems such as water pollution, air pollution, erosion and degradation of soils, loss of fertility, deforestation, waterlogging and salinity, pest management, and solid and hazardous waste. These problems develop slowly, almost unnoticed in the daily rush to meet planting dates, production goals, and processing schedules in the quest to deliver quality products. However, positive action must be taken early to ensure that adequate safeguards are in place. Frequently, minor modifications can mitigate long-term environmental problems.

Sustainable development and environmental stewardship are not only socially sound, but also make economic sense. For example, effective environmental management practices can reduce costs of production by making more efficient use of inputs and by reducing the cost of handling waste material, by either source reduction or recycling. Agricultural production costs can be decreased through reduced fertilizer requirements and reduced pesticide use, both of which are components of Integrated Pest Management programs.

The purpose of this paper is to call attention to some of the environmental problems that affect the long-term sustainability of agribusiness projects. The paper provides strategies for identifying and dealing with these problems before they inflict long-term and possibly irreversible environmental damage. Implementation of these strategies will help maintain the economic viability and sustainability of agribusiness projects and enterprises.

# DEVELOPING ENVIRONMENTAL PROFILES FOR AGRIBUSINESS PROJECTS

Establishing an environmental profile is one way to increase the sustainability of a project or operation. The process of establishing a profile must be flexible and informal, phased to allow the concentration of time and resources where they are needed. The profile must cover not only the environmental issues identified at a project site but also issues that arise during project implementation. The profile should examine the use of raw materials so that waste streams may be minimized through pollution-prevention methodologies and more effective use of waste materials. It is also important that the economic consequences of environmental risk management, both positive and negative, be fully understood.

Guidelines that have been developed for complete Environmental Assessments suggest these assessments are large and complex, requiring input from a variety of professional disciplines.[1] To alleviate the psychological and economic burden of this conventional approach, we propose an approach that is less formal, less onerous, and less draining on resources but one that can be upgraded to meet the requirements of a complete Environmental Assessment, if needed.

The approach follows the general procedures that are well established in the United States and practiced by international lending agencies for conducting Environmental Assessments. The approach allows completion of the environmental profile in two phases. A Phase I environmental profile contains an overview of the facility or project to identify potential environmental problems. Preparing the overview requires a general understanding of the project area, project operations, waste streams, soil use, pesticide management, and pollution-prevention practices — as well as a good understanding of past and present operations and information on activities in adjacent areas. A Phase I profile concludes with a written report assessing the environmental risks that may or may not be associated with the project and a recommendation for further action if warranted. The recommendations focus on potential corrective actions and the need for additional analysis of specific environmental issues or risks.

A Phase II environmental profile depends on the results of the Phase I evaluation and includes more in-depth analysis of known or suspected environmental problems. Analysts preparing a Phase II profile may collect field samples to characterize any problems. Depending on the nature of the problems, analysts can identify viable alternatives and apply those that fit the severity of the problem and afford the greatest benefit at least cost. To determine which alternatives to apply, analysts use remediation plans and cost-benefit analysis.

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[1]U.S. AID Environmental Sourcebook by ASSET, Washington, D.C., January 1994

22 Code of Federal Regulations (CFR) Part 216. Office of the Federal Register, National Archives and Records Administration, Washington, D.C., 1994

World Bank Technical Paper No. 139 Environmental Assessment Sourcebook Volume I "Policies, Procedures and Cross-Sectional Issues" and Volume II, Sectorial Guidelines.
The World Bank, Washington, D.C., 1991.

National Environmental Impact Assessment Guidelines 1993. IUCN. The World Conservation Union Naticnal Convention Strategy Implementation Project, Katmandu, 1994.

The following sections outline the steps to follow in preparing an environmental profile.

## OVERVIEW AND IDENTIFICATION OF POTENTIAL ENVIRONMENTAL IMPACTS — PHASE I

### Description of the Proposed Project

The first step in understanding the environmental aspect of a specific project is to provide a reasonably complete description of the project using site maps and drawings and aerial photographs, where appropriate. This step should define the scope and extent of project activities, including location, general layout and characteristics of the production or processing facilities, land base, topography, and soil conditions. Management capabilities and ownership should be defined, and infrastructure such as marine terminal deep-water ports, pipelines, and roads should be described. Specific items to be included are the following:

- Characteristics of the production and processing facilities, location, general layout, size, capacity, and life-span.

- Preconstruction and construction activities of processing and production facilities, transportation terminals, deep-water ports, pipelines, roads, or other infrastructure required.

- Operation and maintenance activities, including

  — throughput of raw materials;

  — handling operations for raw materials, and the form in which they are introduced into the production process, and off-loading, conveying, pretreatment, and storage operations (whenever possible, information should be supplied on the source and quantities of the by-product, waste material, and pollutants generated during each operation);

  — specific process control measures. Variations in the processes result in different amounts and qualities of pollutants being released into the environment;

  — waste disposal and pollution control measures categorized by type — continuous, batch, intermittent, and emergency (spills, accidents) — especially waste minimization (source reduction or recycling) schemes; and

  — transportation requirements and the extent to which facilities are owned, operated, or supported by the proposed agroindustry. Transportation requirements for raw materials such as live animals, vegetables and fruits, and plant residues should be evaluated.

- Sources of raw materials. If production of the raw agricultural products is part of the project, this fact should be so stated and the production area described as noted above.

**Description of the Environment**

To complete the screening step, a description of the environmental setting is needed. This can be completed initially in general terms; if problems are identified, more detailed analyses may be required. The description includes the following factors:

- Physical environment. Geology, topography, soils, climate and meteorology, ambient air quality, surface and groundwater hydrology, coastal and oceanic parameters, existing sources of air emissions, existing water pollution discharges, and receiving water quality;

- Biological environment. Flora; fauna, including aquatic organisms (particularly fish); ecologically important or sensitive habitats, including parks or preserves and significant natural, cultural, or historic sites; any biological factors — for example, pests — likely to influence the supply of raw materials to the facility; and rare or endangered species or species of commercial importance;

- Sociocultural environment, including both baseline information and impact as appropriate. Population; land use; planned development activities; community structure; employment; distribution of income, goods, and services; recreation; public health; cultural properties; tribal peoples; and customs, aspirations, and attitudes.

**Legislative and Regulatory Considerations**

A description of the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, and land use control at international, national, and local levels will be required. USAID projects, for example, are subject to Executive Order No. 12114, dated January 4, 1979, entitled "Environmental Effects Abroad of Major Federal Actions." This order requires that environmental considerations be taken into account when decisions are made under provisions of the Foreign Assistance Act pertaining to environmental and natural resources. It is USAID's policy to do the following:[2]

- Ensure that the environmental consequences of USAID-financed activities are identified and considered by USAID and the host country prior to the final decision to proceed, and that appropriate environmental safeguards are adopted;

- Assist developing countries to strengthen their capabilities to evaluate the effects of development strategies and projects and to implement effective environmental programs;

- Identify impacts of USAID's action on the global environment;

- Define environmental factors that constrain development, and carry out activities that restore the renewable resource base.

Regulatory considerations affecting host countries should also be examined at the international, regional, and local levels to ensure compliance. Assisting developing countries in strengthening the regulatory capacity of their environmental policies and programs is a cornerstone of USAID policy.

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[2] USAID Environmental Sourcebook by ASSET.

**Identification of Potential Environmental Impacts**

During this task, the project information collected as part of the first three tasks is analyzed, and potential positive and negative environmental impacts are identified. This task is best done by an experienced analyst who visits the project site to observe project processes and operations. In lieu of a site visit, but with a good description of the project, potential environmental impacts could also be identified and highlighted for further analysis in Phase II.

This task should identify the direct and indirect impacts and the immediate and long-term impacts of the project on the environment. If possible, costs and benefits of environmental impacts should be described quantitatively so that an economic assessment can be made. Because of the wide variety of projects that may be covered under this program, an important part of this task is to identify the nature of the impacts so that appropriate analysis can be made under Phase II, if required.

Depending on the scope of the project under examination, the following areas will be reviewed:

- Soil management practices and soil fertility;
- Extent of land clearing or deforestation that has occurred in the past and is expected to occur in the future;
- Waterlogging and salinity issues (if irrigation is involved);
- Long-term water depletion;
- Local pest environment and pesticide use;
- Nitrate and bacterial contamination of water supplies;
- Presence of above-ground and below-ground storage tanks and their contents;
- Raw material handling, waste recovery, and waste disposal specifications (to minimize the potential for disease transmission, especially in slaughterhouses and tanneries);
- Processing plant effluent studies to define the extent of potential pollutant loading to receiving waters and to develop alternatives for providing appropriate levels of treatment;
- The quality and quantity of solid wastes generated, possible alternative uses, and the potential impacts from their disposal;
- Transportation impacts;[3]
- Effects of facility development on aesthetics and visual quality;

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[3] When a facility is to be sited in a remote or sparsely populated area, the impacts from planned and unplanned in-migration into the area must be evaluated. These include effects on natural resources — for example, clearing of forests for agriculture — social structures, and the local economy.

- Ability of the community or government to provide emergency response services for accidental release of dangerous chemicals (in most instances agroindustries pose no significant threat in this respect), and availability of medical facilities and trained personnel to respond to medical emergencies; and

- Potential for planned or unplanned development to result from the project and associated environmental and socioeconomic effects.

## DETAILED ANALYSIS OF THE PROBLEM AREAS AND ALTERNATIVES FOR ENVIRONMENTALLY SOUND AGRICULTURAL PROJECTS — PHASE II

The development of a Phase II environmental profile depends on the results of Phase I, with concentration on known or suspected environmental problems. It is impossible to predict the specific type of expertise needed to develop a Phase II profile because such profiles are prepared by a wide variety of agricultural and agribusiness operations and because Phase II analysis is tailored to the specific project and problem areas that are identified in Phase I. The main Phase II tasks are outlined below.

### Final Identification of Environmental Problems

A Phase I profile frequently is a desk study, done after only a quick visual inspection of the site, that identifies possible problem areas. Before Phase II begins, a qualified specialist reviews the identified or suspected problems. The specialist recommends alternatives to existing practices that would reduce or mitigate long-term damage. Depending on the nature of the problem to be addressed, the specialist may recommend that hydrology of the site be investigated further. Similarly, if the specialist determines that testing is necessary to obtain a complete picture of the environmental situation, sampling procedures may have to be developed and carried out. All information will be gathered, studied, and documented to explore known or suspected environmental problems.

### Development of Environmental Alternatives

Once the specific environmental problems are understood, the next step is to develop alternatives for reducing potential impacts. Pollution-prevention methodologies, for example, may alleviate long-term impacts through more appropriate use of raw materials or modified processing technologies. The identification of alternatives extends to all aspects of a project and ideally is included in the initial design phase. For ongoing projects, potential alternatives may be more limited but should still extend to siting, design technology selection, construction techniques and phasing, and operating and maintenance procedures. Alternatives must be examined and compared in terms of potential environmental impacts. Also, investment and operating costs, institutional training needs, and monitoring requirements, if any, should be examined. It is important to describe the environmental impacts, classify them as irreversible (or unavoidable) or as mitigable, and quantify their costs or the costs of mitigating them. Costs calculations should include initial investment costs and annual operating costs; savings from waste reduction, lower use of raw materials, input costs and avoided future costs; and estimated costs of any associated mitigative measures. The cost and savings or benefits information is important to allow the decision makers to finance the various alternatives properly.

A likely and promising alternative for many agriculture production projects is the implementation of Integrated Pest Management (IPM) procedures. The annex of this report presents the basic elements of a program for pest and pesticide management as an alternative to conventional practices. The pest and pesticide management program is separated into two major components. First is the adoption of IPM practices for the management of pest damage. Second is increased stewardship in the safe handling and use of pesticides included in an IPM program. Proper stewardship and management of pests can not only reduce production costs but also diminish the threat of long-term environmental damage.

**Development of a Management Plan to Ensure Long-Term Sustainability**

The next task in the process of ensuring a project's long-term sustainability is to develop an appropriate management plan. This task includes the recommendation of feasible and cost-effective measures to prevent significant environmental impacts or reduce them to acceptable levels. Recommendations must be based on a clear understanding of the long-term environmental effects and the associated costs and benefits of those measures and of the institutions and training required to implement them. The management plan should include proposed work programs, budget estimates, and projected training requirements.

**Identification of Institutional Needs for Effective Implementation**

The authority and capability of institutions at the local, provincial or regional, and national levels are very important to the process of developing an environmental profile. The environmental profile may be expanded to include a review of regulations and steps to strengthen, modify, or expand them as appropriate. Recommendations contained in the profile may extend to new laws and regulations, new agencies or agency functions, intersectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support — depending on the project.

**Development of a Monitoring Plan**

A detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation may also be developed as part of the environmental profile. The extent and nature of the plan depend on the nature of the key environmental parameters that are affected by the project and are, by necessity, designed to follow the initial tasks in the profile. The monitoring plan should include estimates of capital and operating costs and a description of other inputs, such as training and institutional strengthening, needed to carry it out.

**Documentation of the Environmental Profile**

Documentation is an important part of any environmental project. A well-documented environmental profile gives decision makers an understanding of the evaluation process as well as a history of the project with the recommended steps for action. If a formal Environmental Assessment is required after the environmental profile has been prepared, the essential information gathered during the development of the profile will be readily available. The profile contains findings, conclusions, and recommendations, supported by summaries of the data collected and citations for any references used in

interpreting those data. Detailed data and other supporting information are presented in appendixes or in a separate volume. The profile is organized according to the following outline:

- Executive Summary
- Policy, Legal, and Administrative Framework
- Description of the Proposed Project
- Description of the Environment
- Description of Significant Environmental Impacts
- Analysis of Alternatives
- Management Plan
- Assessment of Needs for Environmental Management and Training
- Monitoring Plan
- List of References
- Appendixes
  - List of Environmental Profile Preparers
  - Records of Inter-Agency and NGO Communications
  - Data and Unpublished Reference Documents

# OBTAINING ASSISTANCE FROM RAP IN PREPARING ENVIRONMENTAL PROFILES

The environment is one of the four pillars of USAID policy, and early recognition of problem areas and identification of sustainable, alternative solutions can significantly reduce long-term environmental degradation. And boost savings through improved management practices. For example, more precise use of pesticides in a well-planned IPM plan will save chemical and application costs and, at the same time, reduce the dangers associated with field run-off.

The question is how to best get started in the process that will allow managers to move their projects into compliance with USAID's expressed goals of long-term environmental sustainability. The process we recommend is a staged approach to developing an informal environmental profile. It is designed to be sensitive to resource constraints and moves quickly to a detailed understanding of the environmental problems and opportunities at the project level. Much of the work may be accomplished with local staff, requiring minimal assistance from outside sources.

The Regional Agribusiness Project is specifically designed to assist USAID Asia Missions and project managers in completing environmental profiles and implementing improved environmentally sustainable technologies. Once a background assessment (Phase I environmental profile) has been conducted, action can proceed in two ways. First, direct assistance can be focused on the project areas where immediate action may be required. Second, indirect assistance may be provided through analysis of environmental profiles of many projects in one country or one region to identify common themes that can be dealt with on a broader basis. Once common environmental themes are identified, common research requirements and technology interventions can be recognized and pursued with assistance from USAID and RAP, saving individual projects and countries from great expenses that might be incurred from future environmental mishaps in agribusiness.

# ANNEX

## ENVIRONMENTAL IMPACTS OF PEST MANAGEMENT AND PESTICIDE USE

# 1.0 BACKGROUND

There are many issues associated with pest control and pesticide use that can impact a project's economic and environmental sustainability. Without proper stewardship, not only do these issues cause environmental problems, they also can result in added costs for project operations and can increase financial liability. Some of these key environmental or stewardship issues related to pesticide use and related storage and handling include:

## 1.1 Pesticide Use Issues

- Pest resistance
- Plant phytotoxicity
- Pesticide drift
- Surface water/drinking water contamination
- Leaching and groundwater/drinking water contamination
- Worker safety
- Food residues
- Endangered species threat
- Non-target species poisonings and harm to beneficial organisms

## 1.2 Pesticide Storage and Handling Issues

Spills from storage
Spills from transportation
Spills from mixing and loading
Groundwater and surface water contamination
Improper application
Handler exposure and poisoning
Fire risks
Pesticide waste materials, rinsate and packaging

There are options for mitigating these issues that not only benefit the environment, but many also enhance long-term economic viability. A general overview of these options is presented below.

## 2.0 OPTIONS FOR ECONOMIC AND ENVIRONMENTAL SUSTAINABILITY RELATIVE TO PEST MANAGEMENT AND PESTICIDE USE

The options for establishing and maintaining economic and environmental sustainability in the management of pests fall into two major categories. First, is the adoption of integrated pest management (IPM) practices for the actual management of pest damage. Second is increased stewardship in the safe storage, handling and use of those pesticides included in an IPM program. Key elements of these two areas of improved pest and pesticide management are summarized below.

### 2.1 Elements of an IPM Program

There are many components of an effective IPM program that incorporate an understanding of pest population and damage, cropping practices, effects of weather and climate, soil characteristics, pest predators, pesticide performance, toxicity and use characteristics, effective cultural practices, pest and/or pesticide resistant crop varieties and biotechnology to name a few. Summarized below are key elements of an IPM program to help incorporate the numerous and complex considerations required of an effective pest management program. Many of these can result in direct economic benefits as well as environmental benefits but do involve adoption of different management strategies and acceptance of some additional short-term risks.

Understanding Pest Population Dynamics and Damage — Either through education or use of consultants, project managers should fully understand critical pest development stages and their relationship with critical crop development stages. Early planting or late planting can sometimes reduce the potential for economic losses from a particular pest.

Field Scouting — Frequently scheduled field scouting is a must to monitor both pest population levels and plant development stages. It is also necessary to time pesticide applications and determine potential for lower rate applications.

Maximizing Effect of Beneficial Species — This involves a coordinated program of establishing and maintaining critical populations and habitats for beneficial parasites, predators and pathogens. Types of critical activities include use of low or non-toxic pesticides, maintenance of trap crops or cover crops and supplemental releases of beneficials.

Planting Pest Resistant Varieties — Many pest resistant varieties of crops exist for various pests and many more will be developed in the near term through plant breeding and genetic engineering. An important part of IPM is being current on resistant varieties.

Using More Selective and/or Biological Pesticides — Using selective pesticides reduces long-term use levels as selective or biological pesticides can supplement predator or parasite populations.

Controlling to Economic Thresholds (Tolerable Pest Damage Levels) — Often pesticides are applied when no real economic damage would have occurred. Controlling at or to economic thresholds reduces pesticide use and costs.

Using Effective Pesticides of Least Human or Environmental Risk — IPM includes toxicity and use risks as important considerations in selecting a chemical for pest management. The benefits of

selecting lower risk chemicals are less stress on natural predators, fewer problems with phytotoxicity and non-target poisonings and lower liability risks from pesticide drift or runoff.

Using Pesticides Consistent with Local Environmental Conditions (Climate, Flora, Fauna, Geography, Hydrology, and Soils) — IPM also matches chemical characteristics with local environmental characteristics to improve performance and lower environmental risks. For example, some pre-emergent herbicides perform better in certain types of soil; in other cases, a certain insecticide may perform better in a selected range of humidity. Pesticides have different levels of toxicity to bees and, if bees are important in pollination for treated and/or neighboring crops, a pesticide's effect on pollinators must be considered.

## 3.0 ELEMENTS OF SAFE STORAGE, HANDLING AND USE OF PESTICIDES

### 3.1 Fundamental Principle of Pesticide Storage and Handling Pesticides Safely

The principles listed below represent a starting point with respect to safety problems in the application, mixing, loading, transportation and storage of pesticides. One of the most important factors in assessing safe storage and handling pesticides is where such practices take place. How near is their location to water, lakes, rivers, protected and unprotected wells, and groundwater? Do people live and work nearby? Other principles in developing a sustainable program for the handling of pesticides include:

- training of applicators, mixers, loaders and other handlers,
- proper construction of storage and mixing areas for containment and leak control,
- proper fire protection and response equipment,
- frequent inspections and checklists for safe operations,
- proper handling of rinsate, waste and empty containers,
- safe pesticide transport procedures,
- spill response plans and training in spill clean-up procedures.

# PESTICIDE STORAGE AND HANDLING ENVIRONMENTAL CHECKLIST

Identifying areas at a facility that require updating and improvement is an important part of being a responsible environmental steward. The following checklist covers some of the areas that pesticide handlers should evaluate regularly. It is not intended to take the place of an independent environmental audit, nor does it assure full compliance with laws and regulations governing a business operation.

## Pesticide Storage and Handling

*Prevention of air, soil, and surface and groundwater contamination should be a top priority in the operation of your facility*

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| | | |
|---|---|---|
| ☐ Yes | ☐ No | Are agrochemicals stored in a separate area to prevent possible contamination of animal feed, grain, fertilizer, or other materials? |
| ☐ Yes | ☐ No | Are flammable/combustible materials segregated from all ignition sources? |
| ☐ Yes | ☐ No | Are all bulk chemicals under a roof? |
| ☐ Yes | ☐ No | Are all bulk chemicals inside a diked area? |
| ☐ Yes | ☐ No | Is rainwater captured in your diked area collected for use in your application blends or mixes? |
| ☐ Yes | ☐ No | If pesticide tanks are under roof, is the containment volume adequate to hold at least 110% of the largest single tank within the containment area (taking into consideration the displacement volume of all tanks within the area)? |
| ☐ Yes | ☐ No | If the containment area is not under roof, is the containment volume adequate to hold the volume of the largest single tank within the containment area (taking into consideration the displacement volume of all tanks within the area), plus freeboard and rainfall amounts common in your area? |
| ☐ Yes | ☐ No | If the pesticide containment area is outside, do you have plans to bring it under roof? |
| ☐ Yes | ☐ No | Are routine inspections made of the storage area to check for leaks and spills? |
| ☐ Yes | ☐ No | Are these inspections documented? |
| ☐ Yes | ☐ No | Are inspections filed on site? |
| ☐ Yes | ☐ No | Are leaks repaired immediately? |
| ☐ Yes | ☐ No | Are spills immediately cleaned up and the waste properly disposed? |
| ☐ Yes | ☐ No | Is the containment area equipped with a spill collection sump and holding tank? |

☐ Yes ☐ No Are all pesticide mini-bulk tanks stored in an area that would prohibit runoff into streams, ditches, or well heads?

☐ Yes ☐ No Are contained fluids reused in product mixes?

☐ Yes ☐ No Are packaged chemicals stored inside a secure building designed to hold water or other chemicals used in fire extinguishing?

☐ Yes ☐ No Are all pesticide containers kept closed except during transfer operations?

**Mixer and Loadout Areas**

☐ Yes ☐ No Is the mixer located within a containment area capable of holding its contents?

☐ Yes ☐ No Is all product loading done over a loadout pad with a collection sump?

☐ Yes ☐ No Can the loadout pad containment system handle the volume of the largest transport vehicle?

☐ Yes ☐ No Is the loadout pad constructed in a manner to prevent excessive drainage of a rainwater runoff onto its collection sump?

**Rinsate Handling and Reuse**

☐ Yes ☐ No Is all equipment field-rinsed?

☐ Yes ☐ No Is any equipment rinsed at the facility on return from the field?

☐ Yes ☐ No If rinsed at the facility, is rinsate collected and reused?

☐ Yes ☐ No Is rinsate segregated by crop type to facilitate reuse?

☐ Yes ☐ No Is all on-site equipment washdown done on a rinse pad?

☐ Yes ☐ No Is all washwater/rinsate collected and reused?

☐ Yes ☐ No Is a pump available for emptying the rinse pad sump?

☐ Yes ☐ No Is the liquid collected from the rinse and pad sump stored in an above-ground tank?

☐ Yes ☐ No Is the rinsewater storage container connected to a mix tank to facilitate reuse?

## Pesticide Safety and Security

*A safe workplace is critical for pesticide users and their employees. Train and equip employees to recognize occupational hazards and to protect themselves and the facility from harm*

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| | | |
|---|---|---|
| ☐ Yes | ☐ No | Are employees trained in proper handling of fertilizer and pesticide products? |
| ☐ Yes | ☐ No | Are employees trained to use protective clothing, eye protection, and safety equipment? |
| ☐ Yes | ☐ No | Do you have frequent, regularly scheduled employee safety meetings and training? |
| ☐ Yes | ☐ No | Are eye washes, safety showers, respirators, and other personal protective gear and equipment readily available and in good working order? |
| ☐ Yes | ☐ No | Do all employees use appropriate protective gear and equipment when handling products? |
| ☐ Yes | ☐ No | Have employees been instructed not to smoke or eat while handling pesticides? |
| ☐ Yes | ☐ No | Do you have material safety data sheets (MSDSs) for all hazardous materials (such as pesticides, ammonia, or acids) used at the facility? |
| ☐ Yes | ☐ No | Are the MSDSs readily available to all employees? |
| ☐ Yes | ☐ No | Is the mixing area properly ventilated for hot mixing and pesticide handling? |
| ☐ Yes | ☐ No | Are appropriate warning signs regarding hazardous chemicals and no smoking areas prominently displayed? |
| ☐ Yes | ☐ No | Are all product storage tanks labeled properly by content? |

# SAFE TRANSPORT OF PESTICIDES

Pesticides must be transported safely to protect the environment and the public. A pesticide spill, even a small one, can be very expensive to clean up. In addition, the adverse publicity reflects badly on agricultural chemicals and agriculture in general. Use this checklist to make sure you follow the correct procedures for the safe transport of pesticides. Keep this list in the vehicle you use to haul pesticides.

## Do's and Don'ts During Transportation

- Never transport pesticides in the passenger compartment of any vehicle.
- Never allow anyone to ride in the cargo area of a truck while transporting pesticides.
- Do not have edible food or animal feed in the cargo area with pesticides.
- Do not stack pesticide containers above the bed of the truck.
- Do not stack heavy pesticide containers on top of light ones.
- Do not transport pesticides in damaged or leaking containers. Use approved overpack container if pesticides in damaged containers must be transported.
- Do not repackage or add any pesticide to a container intended for another pesticide.
- Remain alert and drive with extreme caution.

## Be Prepared

Always have the following safety equipment on hand:

- Soap and water for cleaning hands, and water for flushing eyes or skin.
- Protective clothing such as disposable coveralls, rubber boots, and chemical-resistant gloves.
- Respirator for toxic fumes.
- Goggles or face shield to protect eyes.
- Absorbent material to contain small spills.
- Shovel to build dirt dikes to contain spills.
- Fire extinguisher.

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- Decontamination solution for pesticide spill cleanup or household bleach if a decontamination solution is not available.

**Inspect the Vehicle**

Remove all tools, equipment, and sharp objects from truck or trailer bed.

Check lights, tires, mirrors, steering, brakes, latch on tail gate, hitch, and safety chains for trailer.

Keep the following items in your truck at all times:

- A tarpaulin to cover paper pesticide containers in case of rain.
- Rope, chain, or straps to secure drums or mini-bulk containers for transport.
- Well-secured containers for transport.

**If a Spill Occurs**

1. Secure the area. Keep people at a safe distance from the spill.
2. Put on safety equipment to protect your health or even save your life.
3. If possible, stop the leak — without endangering yourself or others. To stop a small spill, use absorbent material and contain the pesticide with a dirt dike. Don't use water. Water will spread the spill.
4. Notify the local fire department and state authorities.

# ESTABLISH PROPER CLEAN-UP PROCEDURES FOR SPILLS TO PROTECT WATER SUPPLIES

✓ Spills, when handling, transporting, or using ag chemicals, are a concern for every producer. By knowing what to do if a spill occurs — whether it's on your property or on the road — you can help minimize risk and prevent ground and surface water contamination.

✓ Control the spill as quickly as possible by restoring the container to its upright position, closing a leaking valve or hose, or putting a secondary container in place to catch the leaking solution. Of course, appropriate personal safety equipment should be used, e.g., rubber gloves, rubber boots, and eye protection.

✓ Call your dealer for advice on clean-up of their chemical. The dealer will also give you special safety advice and other information.

✓ Contain the spread of the spill when the leak has been stopped by creating soil dams in the path of the spilled liquid. It may be most important to first divert a spill from a nearby pond or stream and then attempt to stop the leak or spill. This is a judgment call that only you can make.

✓ Begin clean-up as soon as the situation has been stabilized. Quick action on your part to clean up a spill is not only required in many areas, but will prevent the chemical from leaching or washing away in a rainstorm.

✓ Use absorbent materials on pavement or concrete to capture the spilled liquids. They can then be shoveled or swept. An excellent, inexpensive absorbent material to keep on hand for such purposes is nonchlorinated pet litter.

✓ Properly dispose of the drenched soil or absorbent material. This will depend on what and how much was spilled, and the rules for disposal in your state. Contact regional or local officials for legally acceptable options of disposal.

✓ Report the spill if required, before it threatens public health or the environment. If the spill is large or enters a waterway, you'll need to call the local environmental affairs office, the local emergency planning office, or the regional health department. The reporting criteria vary with the chemical spilled, however, so ask your dealer to check the material safety data sheet or call the manufacturer for further details.