Improving Fertilizer Storage and Handling

Keeping Idaho's Water Clean

1. Fertilizer storage practices

When stored safely in a secure location, fertilizers pose little danger to ground water. Keep fertilizer dry and out of the way of activities that might rip open a bag or allow moisture to enter a bulk container.

Locate fertilizer storage areas downslope and at least 400 feet away from your well to provide reasonable assurance well water will not be contaminated. Separation from the well should be greater in areas of sand or fractured bedrock. Worksheet A, *Site Evaluation*, can assist you in ranking your homestead soils and geologic conditions by their ability to keep contaminants out of ground water.

Managing your existing storage facility

Compared to the cost of a major accident, or even a lawsuit, storage improvements can be a bargain. Your cheapest alternative may be to cut back on the amount of fertilizer you store. If that option is not practical, consider how you can protect the fertilizers you keep on hand.

- A locked storage area or building provides security by reducing the chance of accidental spills or theft. Use signs and labels to indicate that the area or building is for fertilizer storage.
- Sound containers are your first defense against a spill or leak. If a bag is accidentally ripped, confine the fertilizers to the immediate area and recover them promptly.
- Provide pallets to keep bags off the floor. Store dry products separate from liquids to prevent wetting from spills.
- If you plan to store large bulk tanks, provide a containment area large enough to confine 125 percent of the contents of the largest bulk container, plus the displaced volume of any other storage tanks. Contact the Idaho Department of Agriculture (IDA) at (208) 334-3550 for more detailed information.
- Store fertilizer separately from pesticides.

Ideally, your fertilizer storage area should be separate from other activities. If the building also serves as a machine shed or as housing for animals, you may find it difficult to meet all the requirements for safe storage.

Fires in a storage area can pose a danger to firefighters and to the environment. Reducing the fire risk in the storage area may be the first step, but other things can be done. You can reduce the damages by anticipating such emergencies. Label windows and doors to alert firefighters to the presence of fertilizer stored in the structure. If a fire should occur, consider where the water will go and where it might collect. A curb around the floor can help confine contaminated water. In

making the storage area secure, also make it accessible, allowing you to get fertilizers out in a hurry.

Building a new storage facility

While a new facility just for fertilizer storage may be expensive, it may be safer than trying to adapt areas meant for other purposes. Keep the principles in mind that were mentioned above. Safe storage can minimize the risk of accidents and spills around your fertilizer storage area.

In the event of an accidental spill, an impermeable (waterproof) floor, such as concrete, helps to prevent fertilizer seeping into the ground and leaching to ground water. A curb built around liquid fertilizer storage areas will prevent contaminants from spreading to other areas.

For bulk liquid fertilizer storage, secondary containment provides an impermeable floor and walls around the storage area, which will minimize the amount of fertilizer seeping into the ground if a tank should rupture or leak.

A properly designed mixing/loading pad can provide for collection of spills that may occur during the transfer of fertilizer to application equipment or nurse tanks. If you must store piles of dry bulk fertilizer, place them on an impermeable surface under cover or in a building. Treat dry fertilizer impregnated with a pesticide, as a pesticide. Store under cover or protect from rain. See *Fact/Worksheet 2* for more information concerning pesticide storage and handling practices.

For information on factors to consider in designing a storage facility, such as ventilation, temperature control, and worker safety, contact the IDA (208) 334-3550 or your county Cooperative Extension System office or Extension Agricultural Engineer, (208) 885-7626, for plans and recommendations. Secondary containment draft rules are being developed by IDA.

2. Mixing and loading practices

Ground-water contamination can result from small quantities spilled regularly in the same place. Spills of dry fertilizer should be promptly and completely cleaned up and placed immediately into the application equipment. Cleaning up spills of liquid fertilizers can be much more difficult.

Better management of your existing mixing and loading site

Liquid fertilizer spills and leaks are bound to occur from time to time. Even if you don't have an impermeable mixing and loading pad, you can minimize contamination by following some basic guidelines:

- Avoid mixing and loading fertilizers near your well. One way to do this is to use a nurse tank to transport water or fertilizer to the field mixing and loading site. Ideally, the site should be moved from year to year within the field of application.
- Avoid mixing and loading on gravel driveways or other surfaces that allow spills to sink quickly through the soil. A clay surface is better than sand or gravel.
- Install an anti-backsiphon device on the well or hydrants. Never put the hose in the applicator tank. Provide an air gap of six inches between the hose and the top of the applicator tank.
- Always supervise applicator filling.
- Consider using a closed handling system in which the fertilizer is directly transferred from the original container to the application equipment, such as by a hose.
- Use rinsate as part of current fertilizer application or mix with subsequent loads. Always apply fertilizer at recommended agronomic rates.

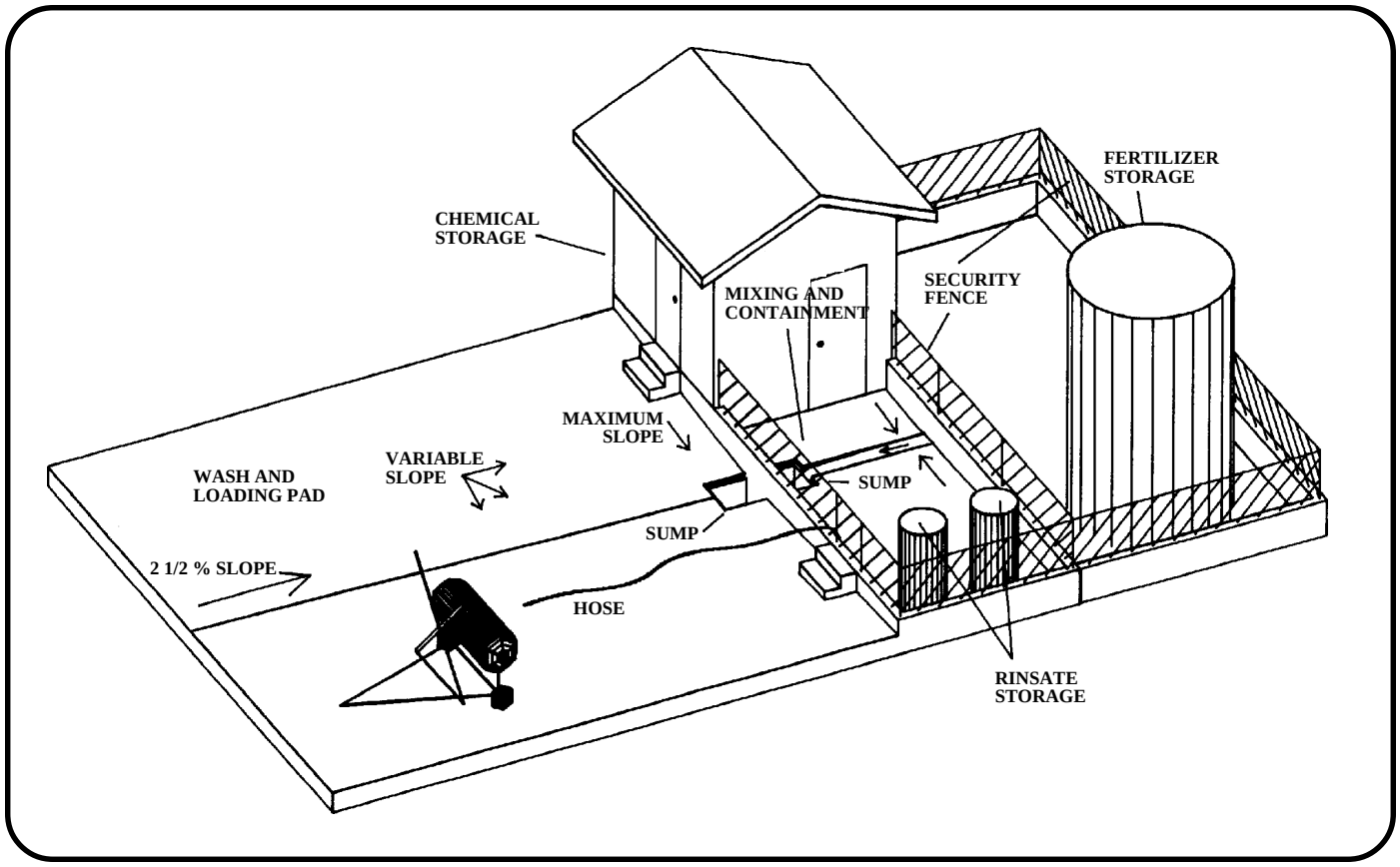

Figure 1: Farm-sized fertilizer facility. *Source: Modular Concrete Wash/Containment Pad for Agricultural Chemicals, by R.T. Noyes and D.W. Kammel. American Society of Agricultural Engineers Paper Number 891613.*

A liquid fertilizer mixing and loading pad

Containing liquid fertilizer spills and leaks requires an impermeable surface (such as coated or sealed concrete) for mixing and loading. A concrete pad should be large enough to accommodate your equipment and to contain leaks from bulk tanks, wash water, and spills from transferring fertilizers to the applicator (*Figure 1*).

Locate the pad adjacent to the storage area. At sites where runoff may occur, construct a diversion to direct runoff away from the well.

The size of the pad depends on the equipment you use. It should provide space around the parked equipment for washing and rinsing. The fertilizers and rinse water should drain to a collection area, such as a sump, for transfer to rinsate storage tanks. Having several separate rinsate storage tanks allows you to keep rinse water from different fertilizer chemical mixes separate. That way, it can be used for mixing water on subsequent loads.

If you are considering constructing a mixing/loading pad, more detailed information is available from county Cooperative Extension System offices or Extension Agricultural Engineer at (208) 885-7626.

3. Spill cleanup

For dry spills, promptly sweep up and use the fertilizer as it was intended. Dry spills are usually very easy to clean up. Dry pesticide-impregnated fertilizer is considered a pesticide and, if spilled, should be recovered and applied to the target crop as it was intended.

For liquid spills, recover as much of the spill as possible and use as it was intended. Some soils contaminated with fertilizer may be required to be removed and field applied at recommended agronomic rates.

Cleanup of a spilled or discharged dangerous waste or hazardous substance must be done immediately. If the person responsible for a spill or discharge is uncertain of its possible significance, notification and/or request for assistance from Idaho State Poison Control is encouraged. It is also expected that control and stabilization of a spill or discharge (e.g. shutting off an open valve or righting an overturned drum) would come first, provided that such activity could be done safely.

For dry spills, promptly sweep up and use the pesticide as it was intended. Dry spills are usually very easy to clean up. For liquid spills, recover as much of the spill as possible. Recovery in the original liquid form is recommended. Otherwise use soil, sawdust or other absorbent material, and place it in a sealable container. It may have to be disposed of as hazardous waste. Contact IDA, Idaho Department of Health and Welfare-Division of Environmental Quality (IDHW-DEQ), a hazardous waste contractor, or your local public health district for disposal procedures.

Spills are generally considered a threat to human health or the environment and should be reported immediately. Spills or discharges within containment structures that are cleaned up in a timely manner typically do not need to be reported. For example, shop floors, concrete pads, or drip pans could be considered barriers to the environment if they are able to prevent contact with the environment. Do not use containment structures to store or accumulate dangerous wastes.

Have an emergency response plan for the site. Know where the runoff water will go, how to handle your particular fertilizers, and whom to call for help.

For further information or assistance or to report spills, contact the nearest Poison Control (800) 632-8000, IDA, or one of the following DEQ offices:

North (Coeur d'Alene):	(208) 769-1422
North Central (Lewiston):	(208) 799-4370
Southwest (Boise):	(208) 373-0550
South Central (Twin Falls):	(208) 736-2190
Southeast (Pocatello):	(208) 236-6160
Eastern (Idaho Falls):	(208) 528-2650

For an updated version of the Idaho Fertilizer Containment Rules, contact IDA at (208) 334-3550.

4. Container disposal practices

Bulk deliveries of anhydrous ammonia, liquid fertilizers, and dry fertilizers have reduced the need to dispose of containers. Many farmers do, however, use bagged fertilizers. Empty bags should be bundled and stored at least 400 feet away from your well, and disposed of properly, preferably in an approved landfill.

Your drinking water is least likely to be contaminated by your disposal practices if you follow appropriate management procedures. However, proper offsite disposal practices, such as disposal at an approved landfill, are essential to avoid risking contamination that could affect the water supplies and health of others.

5. Other management factors

Reducing fertilizer waste makes financial as well as environmental sense, but it means more than just reducing spills. It also means not buying more than you need to apply and keeping records of what you do have on hand. Buying only what you need makes long-term storage unnecessary.

Keeping records may seem like a task unrelated to ground-water contamination, but knowing what you've used in the past and what you have on hand allows you to make better purchasing decisions. Keep records of past field application rates and their effectiveness.

Contacts and References
Who to call about...

Plans and recommendations for fertilizer mixing and loading pads

• Your county Cooperative Extension System office or Cooperative Extension Agricultural Engineer, (208) 885-7626.

Fertilizer storage and containment rules

• Call IDA, (208) 334-3550.

Fertilizer spills and proper disposal of soil contaminated by a fertilizer spill

• Call IDA, DEQ, your local public health district, or emergency coordinator.

Health effects of nitrates in drinking water

• Contact the DEQ, local public health district, or the IDA (208) 334-3550. This is the department's general information contact for all health related issues.

Drinking water quality and treatment

• EPA Safe Drinking Water Hotline, Monday through Friday, 6:30 a.m.– 3 p.m. Pacific Standard Time, call (800) 426-4791, or the DEQ.

• The reporting numbers for the DEQ regional offices are:

North (Coeur d'Alene):	(208) 769-1422
North Central (Lewiston):	(208) 799-4370
Southwest (Boise):	(208) 373-0550
South Central (Twin Falls):	(208) 736-2190
Southeast (Pocatello):	(208) 236-6160
Eastern (Idaho Falls):	(208) 528-2650

What to read about...

Publications are available from sources listed at the end of the reference section. Refer to number in parentheses after each publication.

Ground-water contamination, protection, and testing

• Quality Water for Idaho: Nitrate and Groundwater - CIS 872 (1)
• Quality Water for Idaho: Water Testing - CIS 873 (1)
• Idaho's Water Resources - CIS 887 (1)
• Quality Water for Idaho: Groundwater In Idaho - CIS 900(1)
• Best Management Pracitices for Nitrogen Management to Protect Surface Water - CIS-962 (1)
• A list of laboratories certified to conduct water sample analyses is available from your Cooperative Extension System agent or local health district.

Health effects

• The product label. Read your product labels carefully for specific information on fertilizer health effects.
• *Nitrates and Groundwater: A Public Health Concern.* Freshwater Foundation. (4)

Fertilizer storage, handling, disposal, and safety

• *Designing Facilities for Pesticide and Fertilizer Containment.* Midwest Plan Service. MWPS-37. (2)
• *Constructing an Inexpensive Ag Chemical Rinse Pad.* ACRE fact sheet 14. (5) Discusses capturing wastewater, storage of chemicals, site selection, and the design of a simple rinse pad.
• *Disposing of Crop Protection Chemical Containers. ACRE* fact sheets, 5 and 12. (5) Fact sheet 5 provides an eight-point checklist of procedures to follow for safe disposal of chemical containers. Fact sheet 12 discusses pressure-rinsed and triple-rinsed containers and rinsed container disposal.
• *Chemicals in Your Community: A Guide to the Emergency Planning and Right To Know Act.* 1988. U.S. Environmental Protection Agency. (3) Pages 26-27 contain information on implications of this law for farmers.

Publications available from...

• Your county Cooperative Extension System office. There may be charges for the publications, postage, and sales tax.
• Midwest Plan Service, Iowa State University, Ames, Iowa, 50011, (515) 294-4337.
• U.S. Environmental Protection Agency (EPA), Office of Pesticide Programs (S-766C), 401 M Street S.W., Washington, D.C. 20460.
• Freshwater Foundation at Spring Hill Center, 725 County Road 6, Wayzata, Minnesota, (612) 449-0092.
• Alliance for a Clean Rural Environment (ACRE), P.O. 413708, Kansas City, Missouri 64141, (800) 545-5410.