



Fact Sheet #3

Reducing the Risk of Groundwater Contamination by Improving Fertilizer Storage and Handling

1. Fertilizer storage practices

If stored safely in a secure location, fertilizers pose little danger to groundwater. Common sense suggests keeping fertilizer dry and out of the way of activities that might rip open a bag or allow rain to enter a bulk container.

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

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 bulk liquid fertilizer storage tank should leak.

A mixing/loading pad provides for secondary containment during the transfer of liquid fertilizer to application equipment or nurse tanks. Store piles of dry bulk fertilizer on an impermeable surface under cover or in a building. Treat dry fertilizer impregnated with a pesticide as a pesticide. Store under cover or protected from rain.

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 these simple principles in mind:

1. Locate the dry storage building or liquid secondary containment downslope and at least 100 feet away from private wells and 200 feet from public wells. Separation from the well should be greater in areas of sand or fractured bedrock. Worksheet #11, *Site Evaluation*, can assist you in ranking your farmstead soils and geologic conditions according to their ability to keep contaminants out of groundwater.
2. In the event of a fire, contaminated surface water should drain to a confined area.
3. The mixing and loading area should be close to your storage facility, to minimize the distance that chemicals are carried.
4. The building foundation or secondary containment floor should be well drained and located above the water table. The finished grade should be 3 inches below the floor of the storage area and sloped away from the building to provide surface drainage. The subsoil should have a low permeability.
5. Provide pallets to keep bags off the floor. Store dry products separate from liquids to prevent wetting from spills.

*For glossary,
see Worksheet
#3.*

6. If you plan to store large bulk tanks, provide a large-enough containment area to confine 125 percent of the contents of the largest bulk container, plus the displaced volume of any other storage tanks.
7. A locked storage cabinet or building provides security. Preventing unauthorized use of fertilizer reduces the chance of accidental spills or theft. Provide signs or labels indicating that the cabinet or building is a fertilizer storage area. Labels on the outside of the building give firefighters important information about fertilizers during an emergency response for a fire or spill.
8. Provide adequate road access for deliveries and emergency equipment.
9. For information on factors to consider in the design of a storage facility, such as ventilation, water access, temperature control and worker safety, contact your county Extension office or the New Mexico State University College of Civil, Agricultural, and Geological Engineering at (505) 646-3801 for plans and recommendations.

Modifying an existing storage facility

You may find the above principles to be expensive and difficult to apply to your current storage, but, compared to the cost of a major accident or even a lawsuit, storage improvements are a bargain. Items 5–8 above are also important points to remember for existing storage.

The cheapest alternative you may have is to cut back on the amounts stored. If that option is not practical, consider how you can protect the fertilizers you keep on hand.

Sound containers are your first defense against a spill or leak. Should a bag be accidentally ripped, fertilizers should be confined to the immediate area and promptly recovered.

That means having a solid floor and, for liquid fertilizers, a curb. The secondary containment space should have enough volume to hold 125 percent of the contents of the largest container, plus the displaced volume of any other storage tanks in the area.

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

Stored fertilizers 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. If a fire should occur, consider where the water will go and where it might collect. In making the storage area secure, also make it accessible, allowing you to get fertilizers out in a hurry.

If fertilizer containers are damaged, the stored nutrients may be carried away by water and spread over a large area.

Label windows and doors to alert firefighters to the presence of fertilizer stored in the structure.

A curb around the floor can help confine contaminated water.

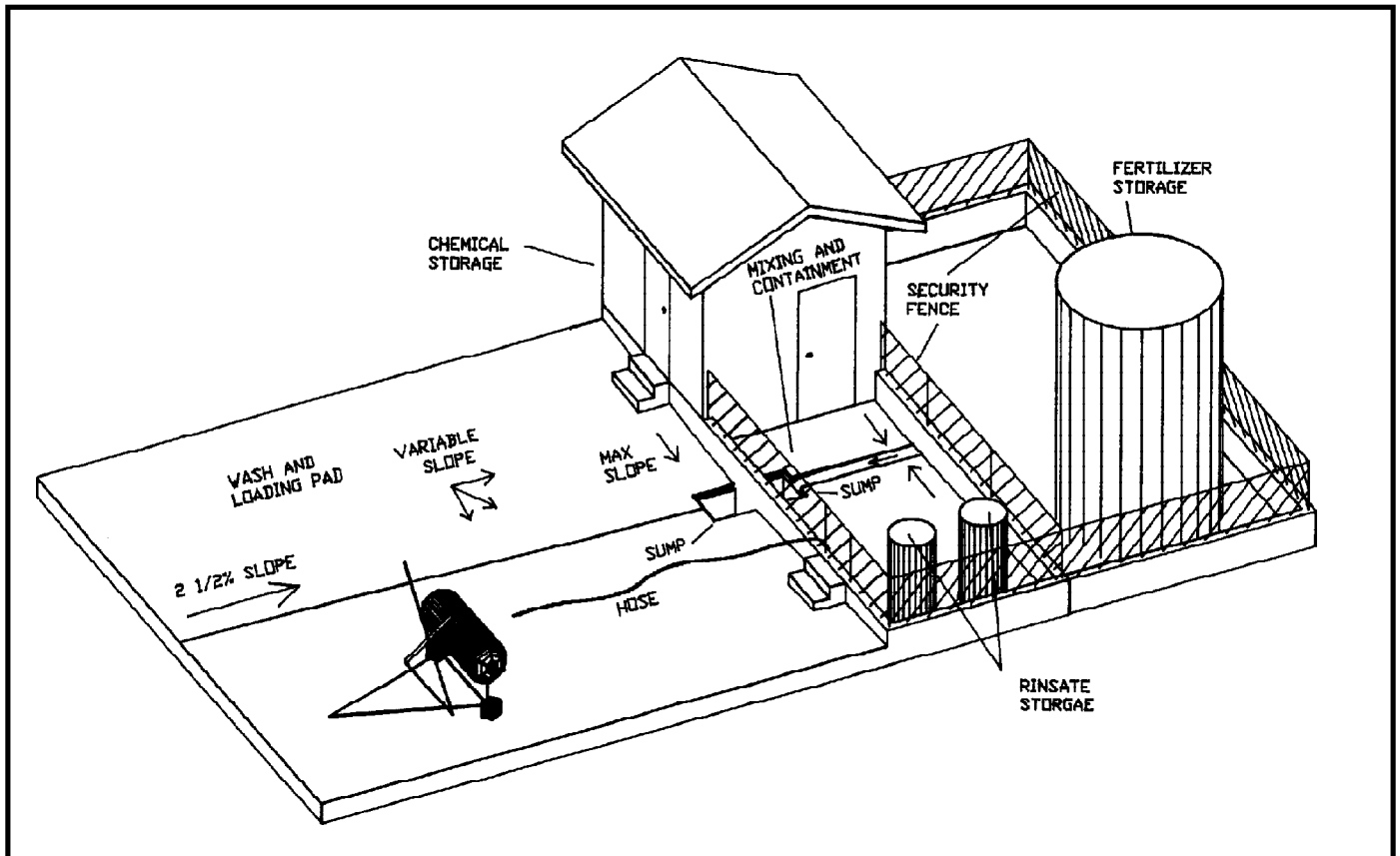


Figure 1: Farm-sized fertilizer facility. Source: *Modular Concrete Wash/Containment Pad for Agricultural Chemicals*, by R.T. Noyes and D.W. Kammel. *American Society of Agricultural Engineers Paper Number 891613*.

2. Mixing and loading practices

Groundwater 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.

A liquid fertilizer mixing and loading pad

Containing liquid fertilizer spills and leaks requires an impermeable surface (such as 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 sprayer.

Locate the pad adjacent to the storage area. Make sure that water from the well moves away from the well. At sites where runoff could reach the well, construct a diversion to direct runoff to another area.

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 have a confined area, such as a sump, for settling before 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 Extension offices or the New Mexico State University College of Civil, Agricultural, and Geological Engineering. Call (505) 646-3801.

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 to the mixing and loading site. Ideally, the mixing 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.
- Install an anti-backsiphon device on the well or hydrants. Never put the hose in the sprayer tank. Provide an air gap of 6 inches between the hose and the top of the sprayer tank.
- Always supervise sprayer filling.
- Consider using a closed handling system, in which the fertilizer is directly transferred from the storage container to the applicator equipment, such as by a hose. Humans and the environment are never inadvertently exposed to the chemical.
- Use rinsate for mixing subsequent loads.

3. Spill cleanup

For dry spills, promptly sweep up and reuse the fertilizer as it was intended. Dry spills are usually very easy to clean up. Dry 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 reuse as it was intended. Some contaminated soil may be required to be removed and field applied if possible.

As required by the New Mexico Water Quality Control Commission Regulations, report spills of any amount to streams or lakes. Report spills of more than 50 gallons on the soil or a mixing/loading pad. Smaller quantities of liquid or dry products should be reported if they could cause damage because of the nature of the specific compound or spill location.

To report, call the 24-hour Hotline of New Mexico Environment Department (NMED), Hazardous and Radioactive Materials Bureau, at (505) 827-9329. Collect calls are accepted.

Remove the spilled material and contaminated soil no matter what the quantity, and dispose according to NMED recommendations.

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.

4. Container disposal practices

Bulk deliveries of anhydrous ammonia, liquid fertilizers and dry bulk fertilizers have reduced the need to dispose of containers. Many farmers do, however, use bagged fertilizers and burn the bags in the field. Burning bags is not recommended, and may be a violation of local burn ordinances. Bundle bags and dispose of them in an approved landfill.

Your drinking water is least likely to be contaminated by your disposal practices if you follow appropriate management procedures or dispose of wastes in an approved location that is **off the farm site**. However, proper offsite disposal practices 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 groundwater 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.