



Farmstead BMP Recommendations for Groundwater Protection from Pesticides

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According to the North Dakota State Department of Health, pesticide detections in North Dakota groundwater are sporadic and do not present a general public health hazard. When detected, pesticides in North Dakota groundwater have not exceeded health standards established by EPA. Information from most studies in North Dakota indicate that pesticide detections in groundwater are generally related to the condition of the well and activities around the well.

Pesticide management on the farmstead plays a key role in groundwater contamination. Appropriate pesticide handling practices that help protect the well should always be used whether pesticide contamination is documented or not. Detailed discussion of farmstead best management practice (BMP) implementation is found in the references listed at the end of the fact-sheet. Each reference title includes the source of information and the related BMP numbers.

BMPs

1. Prevent spillage and back-siphoning from spray equipment into the well by preventing overflow and maintaining an air gap between the filling hose and the water level in the tank.

Use anti-backflow devices on filler hoses.

2. Maintain as much distance as possible from the well and the pesticide mixing and loading site.

Distance recommendations range from 25 to 150 feet.

3. Mix, load, and rinse pesticides over an impermeable surface that is designed to drain to a sealed catchment, whenever possible.

4. Rinse chemical containers thoroughly using the triple rinse method or a pressure rinser.

Rinsate can be used as part of the make-up water in the sprayer tank.

5. Recycle pesticide containers and avoid the need to locate an acceptable landfill site.

Use of dissolvable packaging, reusable containers, or returnable containers also avoids the problems associated with finding a suitable disposal site for empty containers. If these options are not practical, dispose of pesticide containers in an acceptable manner. Stockpiles of empty containers should be avoided through timely disposal.

6. Dispose of unused pesticides that have been banned or are no longer wanted to reduce the overall contamination potential from the farmstead.

These chemicals are a particular problem because of possible leakage from containers that have lost their integrity through time. Often the labels are gone, so if there is leakage, the proper method of clean-up is a guess. Until recently, disposal of these types of old chemicals has been a problem due to questions of legal responsibility. New programs have been developed to assist producers with disposal. These chemicals should be stored in a secure location where clean-up of spills or leakage can be accomplished with a minimum of difficulty.

7. Store pesticides in a secure, properly ventilated location where product usefulness can be maintained with minimal risk to people, animals, and the environment.

Moisture and temperature need to be controlled to maintain the life of the product and integrity of its container. This location should have an impermeable surface where spills can be easily contained and cleaned up. All drains must be self-contained or plugged, so that spilled pesticides have no direct connection with surface water or groundwater. The building should be located down-slope and as far away from the well as possible. It should not be located in areas that flood or that have standing water for any length of time. Each pesticide container should have its label plainly visible with the date of storage clearly marked.

Containers should be inspected regularly for leakage, and the proper equipment and materials to rapidly respond to a spill should be easily accessible in the storage area.

8. Attend to all pesticide spills immediately.

After human medical attention has been secured, the proper response includes containment of the spill, if possible, and then contacting the appropriate authorities, if necessary. After the spill has been contained, the area of spillage should be covered with an absorbent and/or neutralizer recommended by the manufacturer of the chemical. Do not hose down the spill; this merely spreads the problem. Shovel or sweep the clean-up material and affected soil into a leak-proof drum and dispose of it according to local regulations for contaminated materials.

9. Attend to all back-siphoning incidents immediately.

If pesticides are back-siphoned into a well or hydrant, report the incident to the North Dakota State Department of Health (NDS DH). Pumping the well as soon as possible after the incident will help to minimize pesticide movement into the aquifer. Recommendations from the NDS DH should be followed regarding the proper disposal of pumped water. Contaminated soil around the hydrant may have to be removed for effective remediation. Follow NDS DH recommendations regarding the extent of excavation and proper disposal of contaminated soil.

10. Clean the pesticide sprayer properly. In the farmyard, clean over an impermeable surface.

Rinse water can be recovered from a sealed catchment and used as part of the makeup-water the next time that chemical is applied. Sometimes, haul-back tank mixes are unavoidable. When this occurs, the haul-back should not be dumped but should be stored and used in a similar fashion as rinse water. **In the field:** To avoid the need for a rinsing pad and storage of rinse water, clean water can be taken to the field in a separate tank. The system can be cleaned by applying the rinse water to an acceptable field.

11. Use closed-handling systems for mixing pesticides where practical.

Closed-handling systems consist of a pump and series of pressure-hoses that allow the user to siphon concentrated pesticide and mix with water without direct contact with the chemical. These systems reduce the safety risk of handling pesticides and also the environmental risk of spills.

12. Locate and construct new wells according to codes that are intended to avoid contamination.

The well contractor cannot avoid sites such as old dumping pits and pesticide mixing areas unless advised about them. Prior to well construction, consider a plan for farmstead expansion, so that future pesticide handling and storage on the farmstead do not jeopardize the integrity of the water source.

13. Decommission or plug old wells, if not intended for future use.

Many farmsteads have several abandoned wells. Abandoned wells should never be used to dispose of any form of garbage or hazardous material, because they are a direct conduit to the groundwater. In many cases abandoned wells are located in the same aquifer as active farmstead wells. All abandoned wells should be plugged with materials and methods that will not allow settling in the future.

Further Information

This circular is one of seven **GROUNDWATER/PESTICIDE FACT SHEETS**. Please refer to the following fact sheets for additional information.

- [AE-1110 What is the BMP Selection Process for Groundwater Protection from Pesticides?](#)
- [AE-1111 How is the Assessment Process for Ground-water Contamination from Pesticides Used for BMP Selection?](#)
- [AE-1112 Farmstead BMP Recommendations for Groundwater Protection from Pesticides](#)
- [AE-1113 Improved Pesticide Application BMPs for Groundwater Protection from Pesticides](#)
- [AE-1114 Integrated Pest Management \(IPM\) BMPs for Groundwater Protection from Pesticides](#)
- [AE-1115 Soil and Water Conservation BMPs for Groundwater Protection from Pesticides](#)
- [AE-1116 Irrigation BMPs for Groundwater Protection from Pesticides](#)

References

Protect Your Water Supply From Agricultural Chemical Backflow Michigan State University Extension Bulletin E-2349 **BMP1**

SAFE Storage, Handling and Disposal of Pesticides and Containers NDSU Extension Bulletin AE-977 **BMP3**

Designing Facilities for Pesticide and Fertilizer Containment Midwest Plan Service Bulletin MWPS-37 **BMP3 BMP7 BMP10 BMP11**

Pesticide Container Rinsing and Water Quality NDSU Extension Bulletin AE-1052 **BMP4**

SAFE Storage, Handling, and Disposal of Pesticides and Containers NDSU Extension Bulletin AE-977 **BMP5 BMP7 BMP10**

Pesticide Act Chapter 4-35 NDCC ND Department of Agriculture **BMP5**

Chemical Container Disposal Sites in North Dakota ND Department of Agriculture **BMP5**

[Assessing Your Hazardous Waste Management Practices](#) NDSU Extension Bulletin AE-1076 **BMP6**

PROJECT SAFE SEND ND Department of Agriculture. **BMP6**

Applying Pesticides Correctly -- A Guide for Private and Commercial Applicators USDA/EPA **BMP8 BMP3 BMP6**

Hazardous Substances Used in North Dakota Agriculture NDSU Extension Circular No. 947 **BMP8**
Sprayer Field Wash System NDSU Extension Circular AE-1041 **BMP10**
Closed Systems for Handling Liquid Pesticides Cornell University Extension Bulletin **BMP11**
Water Well Construction and Water Well Pump Installation **Article 33-18 NDAC** ND State Department of Health **BMP12**
[Assessing the Condition of Your Well and Its Location](#) NDSU Extension Bulletin AE-1074 **BMP12**
[A Guide to Plugging Abandoned Wells](#) NDSU Extension Bulletin AE-996 **BMP13**

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