

# Maine Farm-A-Syst

Farmstead Assessment System

Worksheet 3

## Assessing the Risk of Groundwater Contamination from Fertilizer Storage and Handling

### Why should I be concerned?

Fertilizers play a vital role in agriculture. Over the years, they have increased crop yield and thus farm production dramatically. Commercial fertilizers can be, however, a major source of nitrate. Nitrate-nitrogen levels exceeding the public health standard of 10 milligrams per liter (mg/l equivalent to parts per million) for water have been found in some drinking water wells in Maine. The other major components of commercial fertilizer, phosphorus and potassium, are not generally a groundwater contamination concern. However, phosphorus is a concern for surface water contamination.

Nitrate levels in drinking water above federal and state drinking water standards can pose a risk to some infants. Infants under 6 months of age are particularly susceptible to health problems from high nitrate-nitrogen levels, though it is rare it can include the condition known as methemoglobinemia (blue baby syndrome). Nitrate may also affect adults, but the evidence is much less conclusive.

Young livestock are also particularly susceptible to health problems from high nitrate- nitrogen levels. While livestock may be able to tolerate several times the 10 mg/l nitrate- nitrogen level, levels of 20-40 mg/l may prove harmful, especially in combination with high levels (1,000 ppm) of nitrate-nitrogen from feed sources.

Many Maine producers do not store large amounts of chemical fertilizer on their farms. In fact, many use animal wastes as the primary nutrient source for their crops. However, for those that do store fertilizer on the farmstead, it is important to follow appropriate management procedures for storage and waste disposal. Proper disposal and storage practices are essential to avoid risking contamination that could affect the water supplies and health of you, your family, and others nearby.

**The goal of Farm-A-Syst is to help you protect the groundwater that supplies the drinking water for you, your neighbors, and the public. It is not used for, nor is it related to, any type of enforcement action from any agency.**

### How will this worksheet help me protect my drinking water?

- ◆ It will take you step by step through your drinking water well condition and management practices.
- ◆ It will rank your activities according to how they might affect the groundwater that provides your drinking water supplies.
- ◆ It will provide you with easy-to-understand rankings that will help you analyze the risk level of your drinking water well condition and management practices.

- ◆ It will help you determine which of your practices are reasonably safe and effective, and which practices might require modification to better protect your drinking water.

### How do you fill out the worksheets?

Focus on the well that provides drinking water for your home or farm. If you have more than one drinking water well on your farmstead, fill out a worksheet for each one.

- ◆ Use a pencil. You may want to make changes.
- ◆ For each category listed on the left that is appropriate to your farmstead, read across to the right and circle the statement that best describes conditions on your farmstead. (skip and leave blank any categories that don't apply to your farmstead.)
- ◆ Then look above the description you circled to find your "Rank number" (4, 3, 2, or 1) and enter that number in the blank under "Your Rank."
- ◆ Directions on overall scoring are explained in the next section "What do you do with the rankings?"
- ◆ Allow between 20-45 minutes to complete the worksheet to figure out your risk ranking for management practices and complete the Farmstead Improvement Action Plan.

### What do you do with the rankings?

Step 1: Look over your rankings for individual activities:

- ◆ Low-risk practices (4's): ideal; should be your goal despite cost and effort
- ◆ Low-to-moderate-risk practices (3's): provide reasonable groundwater protection
- ◆ Moderate-to-high-risk practices (2's): inadequate protection in many circumstances
- ◆ High-risk practices (1's): inadequate; pose a high risk of polluting groundwater

Any individual rankings of "1" require immediate attention. Some concerns you can take care of right away; others could be major-or costly-projects, requiring planning and prioritizing before you take action.

Find any activities that you identified as 1's & 2's and list them under "High Risk and Medium-High Risk Practices" in the Farmstead Improvement Action Plan section following the worksheet.

Step 2: Read Fact Sheet # 3, Fertilizer Storage and Handling, and consider how you might modify your farmstead practices to better protect the publics and your drinking water. This may help with filling out the Farmstead Improvement action Plan.

Step 3: Fill out the Farmstead Improvement Action Plan (FIAP). Contact your local Soil and Water Conservation District for technical assistance and help with the FIAP if needed.

Step 4: Implement the FIAP- Contact NRCS for possible designs and/or funding for practices. Funding availability depends on the practice installed and the current USDA farm programs.

## Glossary Fertilizer Storage and Handling

*These terms may help you make more accurate assessments when completing Worksheet 3. They may also help clarify some of the terms used in Fact Sheet 3.*

**Air gap:** An air space (open space) between the hose or faucet and water level, representing one way to prevent backflow of liquids into a well or water supply.

**Anti-backflow (anti-backsiphoning) device:** A check valve or other mechanical device to prevent the unwanted reverse flow of liquids back down a water supply pipe into a well.

**Backflow:** The unwanted reverse flow of liquids in a piping system.

**Backflow prevention device:** (See anti-backflow device.)

**Backsiphonage:** Backflow caused by formation of a vacuum in a water supply pipe.

**Closed handling system:** A system for transferring pesticides or fertilizers directly from storage container to applicator equipment (through a hose, for example), so that humans and the environment are never inadvertently exposed to the chemicals.

**Cross-connection:** A link or channel between pipes, wells, fixtures or tanks carrying contaminated water and those carrying potable (safe for drinking) water. Contaminated water, if at higher pressure, enters the potable water system.

**Milligrams per liter (mg/l):** The weight of a substance measured in milligrams contained in one liter. It is equivalent to 1 part per million in water measure.

**Parts per million (ppm):** A measurement of concentration of one unit of material dispersed in one million units of another.

**Rinsate:** Rinse water from pesticide or fertilizer tank cleaning.

**Secondary containment:** Impermeable floor and walls around a chemical storage area that minimize the amount of chemical seeping into the ground from a spill or leak.



## Worksheet #3

# Fertilizer Storage and Handling: Assessing Drinking Water Contamination Risk

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
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### Fertilizer Storage

#### Dry formulation

<b>3.1 Amount stored</b>	None stored at any time.	Less than ½ ton.	Between ½ and 5 tons	More than 5 tons.	_____
<b>3.2 Type of storage</b>	Covered waterproof storage and stored on pallets. Spills are collected.	Covered waterproof storage but stored on concrete floor. Spills are collected.	Covered waterproof storage but stored on soil floor. Spills not collected.	Not covered, or only partially covered. Spills not collected.	_____

#### Liquid formulation

<b>3.3 Amount stored</b>	None stored at any time.	Less than 55 gallons.	Less than 55 gallons.	More than 500 gallons.	_____
<b>3.4 Type of storage</b>	Concrete or other impermeable secondary containment does not allow spill to contaminate soil.	Clay-lined secondary containment. Most of spill can be recovered.	Clay-lined secondary containment. Most of spill can be recovered.	Sandy soils that are very permeable or ledge outcrops. No secondary containment. Spills contaminate soil.	_____

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
<b>3.5 Containers</b>	Original containers clearly labeled. No holes, tears or weak seams. Lids tight.	Original containers old. Labels partially missing or hard to read.	Containers old but patched. Metal containers showing signs of rusting.	Containers have holes or tears that allow fertilizers to leak. No labels.	_____
<b>3.6 Security</b>	Fenced or locked storage separate from all other activities, or locks on valves.	Fenced area separate from most other activities.	Open to activities that could damage containers or spill fertilizer.	Open access to theft, vandalism and children.	_____

### Mixing and Loading Practices

<b>3.7 Location of well in relation to mixing/loading area with no curbed and impermeable containment area</b>	100 or more feet downslope from well.	50-100 feet downslope.	Within 500 feet downslope, or 100 to 300 feet upslope.	Adjacent to well, or within 100 feet upslope.	_____
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### Additional Mixing and Loading Practices for Liquid Fertilizer

<b>3.8 Handling system</b>	Closed system for all liquid product transfers.	Closed system for most liquids hand poured. Sprayer fill port easy to reach.	All liquids hand poured. Sprayer fill port easy to reach.	All liquids hand poured. Sprayer fill port hard to reach.	_____
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### Cleanup and Disposal Practices

<b>3.9 Sprayer cleaning and rinsate (rinse water) disposal</b>	Sprayer washed out in field. Rinsate used in next load.	Sprayer washed out on pad at farmstead. Rinsate used in next load.	Sprayer washed out at farmstead. Rinsate sprayed less than 100 feet from well.	Sprayer washed out at farmstead. Rinsate dumped at farmstead or in nearby field.	_____
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Worksheet Section #	List High Risk and Med-High Risk practice(s)	Alternative Low Risk practice (Include potential sources of technical and financial assistance.)	Action Plan	
			Planned completion date	Indicate date when completed

I understand that this farmstead assessment (Farm-A-Syst) and corresponding Farmstead Improvement Action Plan were developed on the basis that I have disclosed, to the best of my knowledge, all information pertaining to my farmstead operations.

**Farmstead address:**

Street \_\_\_\_\_

City \_\_\_\_\_ ME, Zip code \_\_\_\_\_

Watershed name: \_\_\_\_\_

\_\_\_ Aerial map with farmstead boundaries is attached

**Producer's signature** \_\_\_\_\_

Date \_\_\_\_/\_\_\_\_/\_\_\_\_

**Farm-A-Syst conducted by:**

Name \_\_\_\_\_

Title \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

## Acknowledgments

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