

## Assessing the Risk of Groundwater Contamination from Milking Center Wastewater Treatment

### Why should I be concerned?

Dairy wastewater is usually considered a dairy sanitation problem. If not carefully managed, however, dairy wastewater can contaminate both groundwater and surface water.

The amount of wastewater generated varies with milking preparation, equipment used and the number of cows. A 100-cow free-stall operation may use anywhere from 100 to 1000 gallons of water per day in the milking center alone.

Milking center wastewater is contaminated with organic matter, nutrients, chemicals and microorganisms. Poorly designed or mismanaged waste disposal systems can contaminate water with ammonia, nitrate, phosphorus, detergents and disease-causing organisms. If not managed properly, these contaminants can be carried directly to a well or cause groundwater or surface water contamination. Surface water can also be affected by manure, milk solids, ammonia, phosphorus and detergents.

**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 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 # 10, Milking Center Wastewater Treatment, and consider how you might modify your farmstead practices to better protect the public 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

### Milking Center Wastewater Treatment

*These terms may help you make more accurate assessments when completing Worksheet #10. They may also help clarify some of the terms used in Fact Sheet #10.*

**Below-ground absorption field:** A wastewater treatment system that applies septic tank effluent to the soil through a trench, bed or pit.

**Field application:** Application of wastewater to croplands and pastures by irrigation equipment or a liquid manure spreader.

**Slow overland flow with slow surface infiltration:** Application of wastewater at one end gently sloping grass filter strip or terrace, so that it is treated as it slowly flows through the plant-soil system. Solids are trapped in vegetation and nutrients are used by and soil microorganisms.

**Soil permeability:** The quality that enables the soil to transmit water or air. Slowly permeable soils have fine-textured materials, like clays that permit only slow water movement. Moderately or highly permeable soils have coarse-textured materials that permit rapid water movement.



## Worksheet # 10

### Milking Center Wastewater Treatment: Assessing Drinking Water Contamination

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
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#### No Discharge Methods

<b>10.1 All wastewater to manure storage with waste applied to fields*</b>	Wastewater delivered directly to liquid manure storage. No discharge expected.	_____	_____	Wastewater delivered to leaking manure storage.	_____
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\* If using this practice, do not complete the rest of this worksheet.

#### Pretreatment (before discharge to soil absorption bed/field)

<b>10.2 Milking cleanup practices</b>	First pipeline rinse captured and added to barn manure. Waste milk never poured down drain. Manure and excess feed removed from parlor before wash-down.	Waste milk poured down drain 10% of the time. Manure and excess feed usually removed before wash down.	Waste milk poured down drain 50% of the time. Manure and excess feed often washed down drain.	All waste milk poured down drain. Manure and excess feed frequently washed down drain.	_____
<b>10.3 Storage/ settling tank</b>	Properly sized concrete or plastic tank, in working order. System designed by expert.	Undersized concrete or metal tank, in working order.	Cracked, leaking tank, undersized or metal, not in working order.	No tank.	_____

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
<b>10.4 Settling tank/grease trap cleanout</b>	Tank cleaned as needed or every 3-4 months.	Cleaned every 6 months.	Annual cleaning.	Tank never cleaned.	_____

### Location of Discharge

<b>10.5 Distance from drinking water well</b>	More than 100 feet downslope from well.	More than 300 feet upslope from well.	Less than 300 feet but more than 100 feet upslope from drilled well and less than 100 feet downslope. Dug well or not designed by professional.	Less than 100 feet upslope from well.	_____
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### Discharge Methods

<b>10.6 Below-ground absorption field</b>	Discharge into properly installed and maintained organic matter or stone bed. Located on moderately permeable soils with over 3 feet to bedrock or water table.	Discharged into a properly constructed conventional wastewater treatment system used only for dairy waste.	<i>Discharge into domestic wastewater treatment system.</i>	Discharge into a dry well or cesspool.	_____
<b>10.7 Surface flow/slow surface infiltration</b>	Applied in sheet flow to moderate slow or permeable soil.* Vegetation regularly removed. Greater than 3 feet to bedrock or water table.	Applied in sheet flow to moderately slow or slowly permeable soil.* Vegetation sometimes removed. Less than 3 feet to bedrock or water table.	Applied in sheet flow to moderately rapid or rapidly permeable soil or soils that have bedrock or water table within 3 feet.	Applied in concentrated flow.	_____

\*NOTE: Although surface application to slowly permeable soils poses a low risk to groundwater, it can lead to surface water contamination. Direct discharge into a water body is a concern for surface water quality and requires a discharge permit. Concentrated flow also has a high potential to contaminate surface water.

Low Risk  
(Rank 4)

Low-Mod Risk  
(Rank 3)

Mod-High Risk  
(Rank 2)

High Risk  
(Rank 1)

Your  
Rank

## Siting

### **Soil Type**

System designed by a professional and inspected.

System designed by a professional. Not inspected.

Not professionally designed or inspected  
Threat to groundwater depends on soils.

Shallow to bedrock or highly permeable soils.  
System not designed by a professional, or inspected.







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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Revision Editors of Farm-A-Syst Worksheet #10: Megan Wooster, AVSWCD; Susan Gammon, AVSWCD; Andrews Tolman, State of Maine CDC Drinking Water Program; Chris Jones, Natural Resources Conservation Service; David Wilkinson, Natural Resources Conservation Service; Dan Baumert, Natural Resources Conservation Service; Mark F. Hedrich, Department of Agriculture; Susan Breau-Kelley, Maine Rural Water Association. 2008.

Original Farm-A-Syst team members: John M. Jemison, Jr., University of Maine Cooperative Extension; Marianne DuBois, Maine Department of Environmental Protection; Tammy Gould, Board of Pesticides Control; Chris Jones, Natural Resources Conservation Service; Lisa Krall, Natural Resources Conservation Service; Craig Leonard, Maine Department of Agriculture; Craig Neil, Maine Geological Survey; David Rocque, Maine Soil and Water Conservation Commission; and David Lytle, University of Maine Cooperative Extension. Original Worksheet #10 Adapted by Lisa Krall, Natural Resources Conservation Service 1995

