

Maine Farm-A-Syst

Farmstead Assessment System

Worksheet 1

Assessing the Risk of Groundwater Contamination from Drinking Water Well Condition

Why should I be concerned?

About 95 percent of this country's rural residents use groundwater to supply their drinking water and farmstead needs. Wells are designed to provide clean water. If improperly constructed and maintained, they can allow bacteria, pesticides, fertilizer or oil products to contaminate groundwater. These contaminants can put your family, your livestock, and your neighbor's health at risk.

There are documented cases of well contamination from farmstead activities. The condition of your well and its proximity to contamination sources determine the risk it poses to the water you drink. For example, a cracked well casing allows bacteria, nitrates, oil and pesticides to enter the well more easily. A spill of pesticides near the well could result in the contamination of your family's drinking water supply. Feedlots, animal yards, septic systems, fertilizer applications and waste storage areas could release large amounts of nitrate, contaminating your well.

Preventing well water contamination is very important. Once the groundwater supplying your well is contaminated, it is very difficult to clean up. The only options may be to treat the water, drill a new well, or obtain water from another source. A contaminated well can also affect your neighbors' wells, posing a serious health threat to your family and neighbors.

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.
- ◆ 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 # 1, Drinking Water Well Condition, and consider how you might modify your farmstead practices to better protect the water that you and others drink. 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

Drinking Water Well Condition

These terms may help you make more accurate assessments when completing Worksheet #1. They may also help clarify some of the terms used in Fact Sheet 4].

Abandoned well: An unused well that has been permanently closed according to Maine regulations.

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

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

Aquifer: Zone in which readily extractable water saturates the pores of the geologic formations.

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

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

Casing: Steel or plastic pipe installed while drilling a well, to prevent collapse of the well bore hole and entrance of contaminants, and to allow placement of a pump or pumping equipment.

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.

Drilled wells: Wells not dug or driven, including those constructed by a combination of jetting or driving. These wells are normally 4 to 8 inches in diameter.

Driven-point (sand point) wells: Wells constructed by driving assembled lengths of pipe into the ground with percussion equipment or by hand. These wells are usually smaller in diameter (2 inches or less), less than 50 feet deep, and can be installed in areas of relatively loose soils, such as sand.

Dug wells: Large-diameter wells often constructed by hand.

Groundwater: Subsurface water in a zone of saturation.

Grout: Slurry of cement or clay used to seal the space between the outside of the well casing and the bore hole, or to seal an abandoned well.

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.

Water table: The upper level of groundwater in a zone of saturation. Fluctuates with climatic conditions on land surface, and with aquifer discharge and recharge rates.

Well cap (seal): A device used to cover the top of a well casing pip

Worksheet # 1

Drinking Water Well Condition: 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
<u>Location</u>					
1.1 Position of drinking water well in relation to pollution sources	Upslope from all pollution sources. No surface water runoff reaches well. Surface water diverted from well.	Upslope from or at grade with pollution sources. No surface water runoff reaches well.	Downslope from pollution sources. Some surface water runoff may reach well.	Settling or depression near casing. Surface water runoff from livestock yard, pesticide and fertilizer mixing area, fuel storage or farm dump reaches well.	_____
1.2 Soil and/or subsurface potential to protect groundwater	Soils with low permeability and bedrock deeper than 6 feet.	Moderately permeable soils and bedrock within 3-6 feet of surface.	Moderately permeable soils and bedrock shallower than 3 feet.	Highly permeable soils with bedrock exposed at soil surface.	_____
<u>Condition</u>					
1.3 Condition of casing and well cap (seal)	No holes or crack, cap tightly secured, screened vent, and casing extends above ground.	No defects visible, well vented but not screened, and casing extends above ground.	No holes or cracks visible, cap loose, or casing top at or below soil surface.	Holes or cracks visible, cap loose or missing, can hear water running, or casing top below ground.	_____
1.4 Casing height above land surface	More than 12 inches above grade.	8-12 inches above grade.	At grade or up to 8 inches above.	Below grade or in pit or basement.	_____

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
1.5 Proximity of farming activities to well	Greater than 100 feet.	Between 50 and 100 feet.	Less than 50 feet.	Less than 25 feet.	_____
1.6 Well age	Less than 20 years old.	21-50 years old.	51-70 years old.	More than 70 years old.	_____
1.7 Well type	Drilled.	Driven-point (sand point).	Dug well with concrete walls.	Dug well with stone walls and wooden cover.	_____

Management

1.8 Backflow prevention	Anti-backflow devices (such as check valves) installed on all faucets with hose connections. No cross-connections between water supplies.	Anti-backflow devices installed on some faucets with hose connections.	No anti-backflow devices. Air gap maintained.	No anti-backflow devices. Air gap not maintained. Cross-connections between water supplies.	_____
1.9 Unused well	No unused, unsealed wells.	Unused wells capped and protected.	Unused, unsealed well in field. Not capped or protected.	Unused, unsealed well in farmstead. Not capped or protected.	_____
1.10 Water testing	Consistent satisfactory water quality, meets drinking water standards. Bacteria, nitrate and other tests meet standards.	Occasional color changes but bacteria and nitrate within drinking water standards.	Bacteria, nitrate and other tests do not meet standards.	No water tests done. Water discolored after rainstorm or during spring melt. Noticeable changes in color, clarity, odor or taste.	_____
1.11 Water testing frequency	Tested every year.	Tested at least once every two years.	Tested every three to five years.	More than five years between tests.	_____

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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Original Worksheet #1 Written by Craig Neil, Maine Geological Survey. 1995.

