Keeping Livestock and Horses on Small Acreages

Assessing Your Risks to Water Resources

Fact sheet 4, Small Acreage Livestock and Horse Series, March 2010

Assessing your risks using the Self-assessment Worksheets 1 and 2

The following information and self-assessment worksheets will take you step by step through various factors that affect the potential risks from a livestock yard and manure storage or composting area to water resources. It also considers whether your animals have access to surface waters or a drinking water well.

The worksheets will help you identify and determine the relative risk of your site and practices as being "Low", "Medium", or "High" to potentially impacting water quality. Keep in mind that these ratings are relative. A water quality problem could exist even though your relative rating results in a "Low" risk. Likewise, a "High" risk rating does not necessarily mean there is a water quality problem. The worksheets will help you determine which factors or practices might benefit from some changes and how to reduce potential risk.

The worksheets have been designed for small acreage livestock and horse owners in Rhode Island that may not qualify for traditional agricultural program assistance or have the same set of conditions as larger scale livestock farms. The worksheets have been adapted from **Farm*A*Syst** Program materials from various states.

Contact the USDA Natural Resources Conservation Service, Warwick, Rhode Island at (401) 828-1300, **www.ri.nrcs.usda.gov** for more information on animal waste management and to determine eligibility for a variety of agricultural and natural resource conservation programs.

Understanding and completing the worksheets

Follow the directions at the top of page one on each of the assessment worksheets. The following provides a summary of the factors and categories listed on the assessment worksheets and why they are important. These summaries help provide you with background information needed to fill out the worksheet.

Location

This factor describes where a livestock yard or manure storage area is situated in relation to various water resources or a septic system used to treat household wastewater. Please note that the distances listed in this assessment worksheet provide a general range for determining potential risk to a water resource. The other factors that follow also affect risk to water quality.

These distances do not directly correspond with specific setback distances that are required by various Federal, state, and local laws for alternations or activities within or near to these water resources, except where noted. If you plan to do any new work or activities in close proximity to a water resource, be sure to check with all laws that may apply. Contact the Rhode Island Department of Environmental Management Office of Water Resources at (401) 222-3961, **www.dem.ri.gov** and your local town hall for

more information. If you live near a coastal water resource, contact the Rhode Island Coastal Resources Management Council at (401) 783-3370, **www.crmc.ri.gov.**

Septic systems handle human waste, which is also a source of nutrients and pathogens. The concerns with having a livestock yard or manure storage area near a septic system include potential damage to the system from animal and equipment traffic and compaction, as well as the additional nutrients and pathogens that could be added. For more information on proper septic system operation and maintenance contact the URI Cooperative Extension Onsite Wastewater Training Center at (401) 874-5950, **www.uri.edu/ce/wq.**

Site Characteristics

This factor describes soil texture and drainage – natural site conditions. Soil texture describes how fine or coarse a soil may be. Finer, deeper soils tend to provide more groundwater protection for they can slowly filter out some potential pollutants such as pathogens and nutrients. Soils with a seasonal high water table, coarse soils with rapid drainage, or soils with shallow bedrock pose a greater risk of potential groundwater contamination. Soils with finer texture and medium to slow drainage are more prone to surface runoff, which can also be a concern when the livestock yard or manure storage area is near a surface water resource or storm drain. Livestock yards tend to be compacted due to heavy foot traffic and runoff can tend to be more of a concern.

We ask that you answer these questions about the original/surrounding soils even if the livestock yard is paved or the floor of a manure storage/compost area is paved or lined. Not only can paved and lined areas deteriorate, crack, or experience problems due to the underlying soil type, but other factors listed under the design and management category are also affected by the surrounding soil type.

Determine soil type by field method

One way to determine your soil type is to dig a hole in a representative area within or near the livestock yard or manure storage area. If a livestock yard contains a lot of manure/mud, you may want to find an area just outside the yard. For determining soil texture, rub some of the soil from the upper six to 12 inches (often called the topsoil layer) and compare the feel and sound with that listed in the worksheets.

For determining soil drainage and location of the high water table, you may have to rely on your knowledge of the area. Do you have problems with a wet basement, surface ponding, or septic system failure during wet periods? If you dig a hole during late fall through mid-spring, try to dig down at least 36 inches below the surface to determine if standing water is present at or above that depth.

Soil Survey Map of Rhode Island

Another way to determine your soil type is to obtain a Soil Survey Map of Rhode Island from the USDA Natural Resources Conservation Service. A soil map will provide a typical description and many characteristics of the soil type. Keep in mind that maps may not show small variations. It is important that you verify the map information with what you know about your property.

Design and Management

These factors are very important because design and management of a livestock yard and manure storage or composting area is usually what can be effectively changed to greatly reduce pollution and health risks. A primary manure management goal is to prevent rain and snow from mixing with animal waste – keep clean water clean. Another important management factor considers the handling of runoff that does mix with animal waste -- what happens to that runoff and where does it go? This runoff can contain sediments, nutrients and pathogens. Manure storage and compost areas can also generate leachate (liquids that drain

from within the pile) containing nutrients and pathogens that can move into groundwater.

Worksheet 1 for assessing Livestock Yard Management also considers whether your animals have access to surface waters or a drinking water well anywhere on the property, not just the area of the livestock yard. For example, your animals may have access to a stream or pond when out on pasture.

Concentration of Animals

This category is included in Worksheet 1 for Livestock Yard Management. The area needed per animal for minimizing the risk of surface and groundwater contamination (due to a high concentration of manure and waste) depends on the type of yard surface. Most small acreage farms have a natural earth yard. Paved yards usually consist of a poured concrete pad and are typically used when raising cattle and pigs. The minimum square feet per animal for a paved yard is much less than that needed for an earthen yard, so it can be useful when space is limited and for outdoor concentrated feeding areas. The area needed for a paved yard is a balance between animal traffic and resting area. The minimum square feet per animal recommended for sizing a livestock yard should not be confused with the total land area needed to support one animal unit or 1,000 pounds of live weight (a stocking rate).

Refer to our additional fact sheets and self-assessment worksheets for more information. Available on-line in the Publications section of our website at: web.uri.edu/safewater.

- ☑ Fact sheet 1: Keeping Livestock and Horses on Small Acreages: Protecting Our Drinking Water, Families and Animals
- ☑ Fact sheet 2: Livestock Yards and Manure Storage Areas on Small Acreages: Protecting Our Drinking Water, Families and Animals
- ☑ Fact sheet 3: Pastures, Fencing, and Watering on Small Acreages: Protecting Our Drinking Water, Families and Animals

For More Information and assistance:
University of Rhode Island Cooperative Extension Home*A*Syst Program, 401-874-5398 or web.uri.edu/safewter

USDA Natural Resources Conservation Service and your local Conservation District, 401-828-1300, **www.ri.nrcs.usda.gov** for assistance with animal waste management, soil maps, and other programs.

This fact sheet and self-assessment worksheets originated in April 2005 as part of the University of Rhode Island Cooperative Extension (URI CE) Healthy Landscapes Program and is authored by Holly K. Burdett, Research Associate, URI CE Home*A*Syst Program, Department of Natural Resources Science, and Dr. W. Michael Sullivan, Professor of Agronomy, Department of Plant Sciences, College of the Environment and Life Sciences, University of Rhode Island. This fact sheet was revised in March 2010 by Holly K. Burdett.

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