



# Livestock on Small Acreages

## Assessing Your Risks to Water Resources

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Many small acreage livestock owners live within or close to high density residential areas. Unlike rural properties that are spacious and buffered by woodlands and fields, residential properties usually consist of smaller lots in close proximity to water resources such as ponds, streams, drinking water wells, storm drains and ditches. The amount of land per animal is typically very small, which often creates problems with manure storage, handling and utilization. As rain and snowmelt travel over the land surface and soak down into the groundwater, it can carry pollutants associated with livestock manure and related activities. These pollutants can harm nearby water resources including your own drinking water well or your neighbor's.

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

- The following information and worksheets will take you step by step through various factors that affect the risk a livestock yard and manure storage area might pose to water resources. It also considers whether your animals have direct access to a surface water body.
- It will help you identify and determine the relative risk of your situation 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.
- It will help you determine which factors or practices might benefit from some changes and how to reduce potential risk.
- The self-assessment worksheets have been designed for small acreage, non-commercial properties in Rhode Island that raise livestock and

may not qualify for traditional agricultural program assistance or experience the same set of conditions as larger, commercial livestock farms. The worksheets have been adapted from **Farm\*A\*Syst** Program materials from various states. If you own or operate a commercial livestock farm or wish to determine if you are eligible for agricultural program assistance, contact the USDA Natural Resources Conservation Service, Warwick, Rhode Island at (401) 828-1300 for technical assistance with livestock waste management, risk assessment and program eligibility.

### Understanding and completing the worksheets

Follow the directions at the top of page one of 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 may 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 now required by various Federal, state, and local laws for work 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](http://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](http://www.crmc.ri.gov).

Septic systems handle human waste, which is also a source of nutrients and pathogens. The concern with having a livestock yard or manure storage area near a septic system include potential damage to the system from hoof action and compaction, as well as the nutrients and pathogens that could be added, which greatly increases the risk of groundwater pollution. 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](http://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 more 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 site 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.

### Determining 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.

For determining soil depth, you want to dig down at least 30 inches. You are looking for the depth of the finer soil texture layers before it changes to a much different texture (usually coarse sand, gravel or in some cases bedrock) or color or both. For example, at a depth of approximately 25 inches below the surface, you may notice a drastic difference from a light brown sandy loam to very light yellowish brown gravelly sand. The soil depth in this case is about 25 inches. In some cases, you may not see this drastic change within a depth of 30 inches, so you would check off the column indicating a soil depth of more than 30 inches.

### Using maps to determine soil type

Another way to determine your soil type is to obtain a Soil Survey Map of Rhode Island from the USDA Natural Resources Conservation Service at (401) 828-1300, [www.ri.nrcs.usda.gov](http://www.ri.nrcs.usda.gov), for the area covering your property. It will provide a typical description and many characteristics of the soil type. You can also obtain a very general, much less detailed soils map online at the Rhode Island Digital Atlas, [www.edc.uri.edu/riatlas](http://www.edc.uri.edu/riatlas). 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. For example, if you know that you have slow drainage and seasonal high water table on your property, and the soil map indicates dry, well-drained

soils for the general area, you are best to follow the directions for the field method listed above.

### **Design and Management**

These factors are very important because design and management of a livestock yard and manure storage area is usually what can be effectively changed to greatly reduce risks to water resources and animal health. A primary manure management goal is to prevent rain and snow from mixing with animal waste. 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 containing nutrients and pathogens that can move into groundwater.

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

### **Concentration of Animals**

This category is included in the worksheet for Livestock Yards 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 an earthen yard. Paved yards usually consist of a poured concrete pad and are typically used when raising cattle and pigs. The poured concrete surface area needed is much less than that required for an earthen yard, so it can be useful when space is limited or in combination with an earthen yard – the earthen yard being used during dry weather conditions to prevent mud. The concrete area needed is a balance between animal traffic and resting area. The minimum area 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).

### **For More Information and assistance**

Refer to our additional fact sheets, available on-line, [www.uri.edu/ce/healthylandscapes](http://www.uri.edu/ce/healthylandscapes):

- ☑ Fact sheet 1: *Livestock on Small Acreages: Protecting Water Resources and Health*
- ☑ Fact sheet 2: *Livestock Yards and Manure Storage Areas on Small Acreages: Protecting Water Resources and Health*
- ☑ Fact sheet 3: *Livestock Pastures, Fencing, and Watering on Small Acreages: Protecting Water Resources and Health*

University of Rhode Island Cooperative Extension Home\*A\*Syst Program, (401) 874-5398, [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq); for more information on private well protection and residential pollution prevention topics. For more information on sustainable landscaping and pet waste management, see our website [www.uri.edu/ce/healthylandscapes](http://www.uri.edu/ce/healthylandscapes)

USDA Natural Resources Conservation Service and your local Conservation District, (401) 828-1300, [www.ri.nrcs.usda.gov](http://www.ri.nrcs.usda.gov); for technical information on livestock manure management, pasture management and renovation, soil erosion and runoff control, and soil maps.

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