



PROTECTING PUBLIC HEALTH AND DRINKING WATER

Protecting Water Quality

Historically horse owners are environmentally aware and have a tradition of land stewardship. Because we are all concerned about protecting drinking water, this document is meant to assist you in identifying potential environmental and public health threats to surface and groundwater and using Best Management Practices to eliminate or minimize those threats. Hopefully a little “horse” sense can go a long way to protect not only your horse’s health but also surface and groundwater quality, and prevent potentially costly land reclamation and remediation.

Public water supplies, both groundwater and surface water, are regularly monitored for water quality to ensure that good, clean water is delivered to the consumer. However, water treatment can be very costly to the customer. Therefore, the water suppliers’ goal is to have as pristine a raw water supply as possible to guarantee quality at minimum cost. Not all surface water supplies are filtered; therefore extra measures are appropriate to ensure high raw water quality. Since water suppliers rarely own all of the land that recharges a water supply, land owners and those who utilize those lands should be aware of the potential impacts of their activities on their own and others’ water supplies. Massachusetts Department of Food and Agriculture provides information and technical assistance to owners and operators of agricultural operations.

Private well use is not regulated by the state in Massachusetts. Some communities have local regulations or bylaws and you should check with you Planning Board and Board of Health. In any event, with the help of the MA DEP, neighbors, the local Board of Health and Conservation Commission, private well owners can monitor their own activities and conduct themselves in a sensible manner to protect their own and their neighbors’ water. Remember that your neighbors have wells too! Utilize buffers to separate resources from potential sources of contamination. Refer to MA DEP “Vegetated Buffer Strips” Fact Sheet.

Potential Sources of Contamination

- ◆ Septic Systems
- ◆ Pesticide/Fertilizers
- ◆ Horse Waste
 - ◆ Manure
 - ◆ Urine
 - ◆ Bedding
 - ◆ Runoff from paddocks and fields
- ◆ Petroleum Storage
- ◆ Stormwater runoff
- ◆ Old unused wells
- ◆ Unrestricted access to streams and ponds

Potential Contaminants

- ◆ Microorganisms
 - ◆ Coliform (E. Coli)
 - ◆ Cryptosporidium parvum
 - ◆ Giardia
 - ◆ Salmonella
 - ◆ Campylobacter
 - ◆ Parasites
 - ◆ Other pathogens
- ◆ Nutrient loads
 - ◆ Phosphorous
 - ◆ Nitrate
 - ◆ Potassium
- ◆ Erosion/Sedimentation
- ◆ Hydrocarbons

Possible Regulations

- ◆ MA DEP Drinking Water & Wastewater Regulations
- ◆ Wetlands regulations
- ◆ Local Zoning Bylaws
- ◆ Local Water Supply Protection Bylaws
- ◆ Local Board of Health

Microorganisms of Particular Concern

E. coli and some other pathogens are easily treated by disinfection or filtration. However, C. Parvum and Giardia are of particular concern due to their very low infectious dose thresholds and their resistance to disinfection and traditional treatment. Horses have not been studied as extensively as other farm animals with respect to shedding pathogens; however, researchers in California have determined that a small percentage of healthy adult horses do shed both C. parvum and Giardia as well as more common bacteria and pathogens. Significantly higher numbers of lactating mares, foals, aged and ill horses shed both C. parvum and Giardia. Additionally, the density of animals in a corralled area and keeping horses with other animals may increase the risk of infection. Since there is uncertainty about the instances of infection, caution and prevention is always preferred and is less expensive than, treatment and remediation.

Surface Water

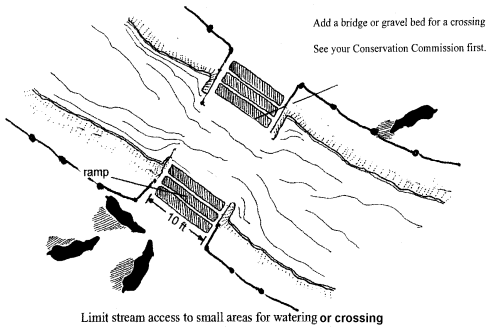
Protection of surface water primarily includes management of runoff and controlling physical access to surface waters and watercourses. Watercourses are defined as wetlands, marshes, river, streams, lakes, ponds, bogs and brooks. Note: MADEP regulations 310 CMR 22.00 prohibit swimming and wading in public surface water sources. The regulations also prohibit stabling, hitching, feeding or grazing animals within 100 feet of the bank of any public water source or tributary stream and prohibits animals from entering reservoirs or tributary streams.

Recommendations for All Surface Waters:

- Fields and pastures - Maintain a minimum of a 100-foot vegetated-buffer strip near reservoirs and along public water supply tributaries; a minimum 50 feet from banks of other streams and ponds.
- Trails - Stay on designated trails. All trails should be minimally 100 feet from any reservoir and tributary stream; minimally 50 feet from all other water courses. *Refer to Vegetated Buffer Strip Fact Sheet.*
- Composting - Setback composting areas minimally 100 feet from watercourses and wells. Don't forget your neighbors. *See Fact Sheet*
- ***Remember: A manure pile does not constitute composting!***
- Construct designated stream-crossing areas using fencing to direct animals to crossings. This promotes bank stabilization. (See figure)
Note: Contact your Conservation Commission first.
- Use alternative watering methods rather than ponds or direct access to streams.
 - Pump or use gravity to fill troughs away from the streams' edge
 - Discharge or pump the old water onto a buffer strip rather than into the field or directly back into the stream. (See figure)
 - Install a secure well or run a water line. In New England the most practical solution is to run a self-draining water line with hot water for winter use.

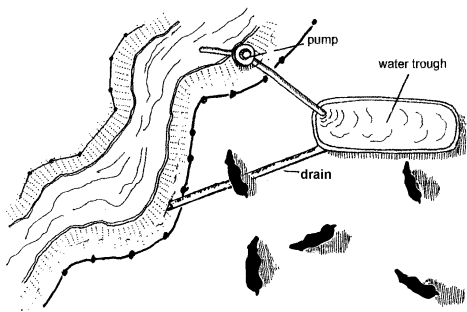
Field and paddock water management

- Direct roof drain run-off to a secure dry well or a vegetated swale away from the paddock, manure composting, hazardous materials storage and heavy traffic areas.
- Store all hazardous materials under cover, on impermeable surfaces with secondary containment as appropriate. Use Best Management Practices when using or transferring hazardous materials.
- Use diversion ditches or terraces to prevent erosion on sloped topography. *Refer to Mud and Pasture Management Fact Sheet*



Limit stream access to small areas for watering or crossing

Contact your Conservation Commission



Gravity flow or pumped water provides a drinking area away from the stream

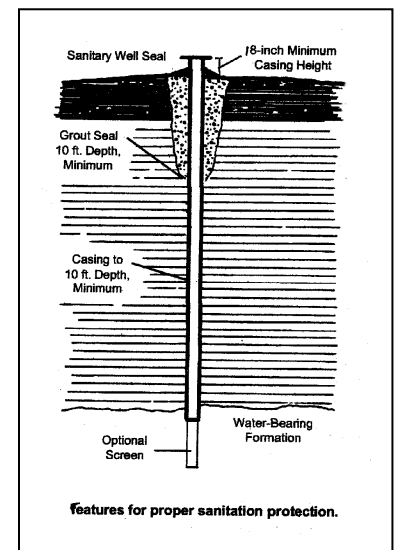
Groundwater

Land located within a public groundwater supply protection area may be subject to local ordinances and bylaws. Contact your Planning Board or Board of Health to locate all public water supply protection areas in your community. Good housekeeping practices and the buffers set forth in the recommendations for surface water protection are all applicable to groundwater supplies. Groundwater and surface water are connected, and protection measures for surface water will also protect groundwater supplies.

To some degree, the natural filtering ability of soil helps to protect groundwater supplies from potential contaminants above grade (contaminated surface run-off) or below grade (septic system leachfields, spilled hazardous materials). Deep wells are generally less susceptible to contamination than shallow wells due to the greater filter capabilities of the soil in deeper wells. Dug wells, well points and springs are the least protected and most vulnerable types of supplies to pathogen contamination.

The following can further protect deep, private well water quality:

- a sanitary (cement) surface seal and a secure, (water tight) well cap,
- an intact, surface casing, no cracks,
- surface drainage is away from the well, (well is not subject to flooding)
- there are devices to prevent back siphoning into the well,
- any floor drains/dry wells are connected to sanitary sewers or tight tanks where hazardous materials are present



Recommendations for Private Wells:

- ◆ Inspect and investigate your water supply.
- ◆ Abandon and seal all “old”, unused wells. Abandoned deep wells can act as conduits to contaminate aquifers. Abandoned, shallow dug wells are often large diameter wells that are potentially physical hazards. All unused wells should be located and sealed. Call DEP or a professional well driller for assistance.

Well Setbacks: All surface water setback distances recommended above, apply to private wells

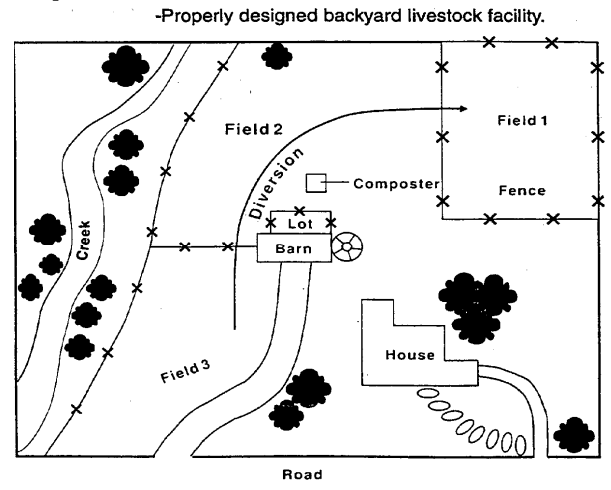
- ◆ Property lines - see local ordinance.
- ◆ Septic tank - minimum 50 feet, refer to Title 5 regulation.
- ◆ Septic system leachfield - minimum 100 feet.
- ◆ Stables, trails, paddocks, troughs, fields, composters and pastures - minimum 100 feet vegetated buffer.

Well Check List:

- ✓ Is your (your neighbor’s) well uphill and greater than 100 feet from potential threats e.g. compost area, paddocks, pastures?
- ✓ Is all runoff channeled away from the wellhead?
- ✓ Is there an intact sanitary seal (cement and clay grout) around your well casing?
- ✓ Is your casing intact, i.e. does not move when you push on it; no visible holes or cracks?
- ✓ Is your wellhead securely capped with a screened, vent?
- ✓ Is your well casing at least 10 feet deep?
- ✓ Is your well greater than 50 feet deep?
- ✓ Do you have clear water with no sediment, odor or distinguishable taste problems?
- ✓ Does your well casing extend a minimum of 18 inches above the ground level?
- ✓ Is your wellhead in an area that never floods?
- ✓ Do you test your well annually for bacteria, nitrate and other constituents?
- ✓ Do you have check valves or other backflow prevention devices?

Management Check list

- ✓ Is your septic system maintained by regularly pumping the tank?
- ✓ Do you dispose of ONLY “human, household” waste in your septic system?
- ✓ Do you practice good housekeeping and use Best Management Practices when handling hazardous materials?



- ✓ Whenever possible, do you consider and use environmentally friendly alternatives, i.e. calcium chloride and sand instead of salt for ice, integrated pest management, and alternative cleaners?
- ✓ Are all floor drains and dry wells sealed or connected to sanitary sewer in areas where hazardous materials can get into them?
- ✓ Do you have a manure management plan (compost)?
- ✓ Are all old, unused wells properly sealed?

If you answer **No** to any of these questions, the most important thing you should do next is to check your water quality.

Do the simple, inexpensive, housekeeping items first. If you need assistance in evaluating your well, contact your Board of Health or a local water supply well driller. Contact the MA DEP for technical advice on water quality issues, protection measures and sealing an abandoned well properly.

If working near wetlands or watercourses, be sure to consult your Conservation Commission to determine if the work is subject to the Wetlands Protection Act. Refer to Fact Sheet

How do I Assess My Situation?

The first step in any process is to have a plan:

- ◆ Inventory your land, the resources and all of the land uses. Don’t forget to include your neighbors if it is appropriate. Their wells and activities are just as important as yours are.
- ◆ Make a map or site plan of your property.
- ◆ Evaluate existing threats.
- ◆ Assess remedies and alternatives that will eliminate or at the very least minimize the threat.
- ◆ Rank the potential threats.
- ◆ Consider regulatory issues, solicit advice and inquire about possible funding sources.
- ◆ Correct priority threats.

References:

For more information, or free assistance in planning or implementing the best management practices described in this brochure, contact your local Natural Resources Conservation Service or the UMass Cooperative Extension Service. Working together, we can make a difference in water resource protection for the Commonwealth of Massachusetts.

<http://www.mass.gov/agr/programs/aeep/index.htm>

Massachusetts Department of Food & Agriculture is a source of funding for some commercial agriculture management strategies.

Natural Resource Conservation Service Offices Serving:	Hampden-Hampshire CD	(413) 586-5440
Berkshire CD	(413) 443-6867	N.E.N.W., S. Worcester CD (508) 829-6628
Essex-Middlesex-Suffolk CD	(978) 692-1904	Cape Cod – Nantucket-Dukes CD (508) 362-9332
Bristol-Plymouth-Norfolk CD	(508) 295-5151	UMass Coop Extension Service (413) 545-4800

Other Fact Sheets for water quality and horse management:	<u>Available from MassDEP</u>
Manure Management for Healthy Horses	<u>Jane Peirce, 508-767-2792.</u>
Manure Impacts on Surface Water Quality	
Mud and Pasture Management	
Composting	
Vegetated Buffer Strips	

<http://www.mass.gov/dep/water/drinking.htm>

Information and publications about Massachusetts DEP Drinking Water Program and Regulations

Regional Coordinators Drinking Water Program	Nonpoint Source (technical assistance/outreach)	
Western Regional Office – Deirdre Cabral	413-755-2148	Jane Peirce, 508-767-2792
Central Regional Office – Marielle Stone	508-767-2827	
Northeast Regional Office – Tom Mahin	978-694-3226	
Southeast Regional Office – Richard Rondeau	508-946-2816	
Boston Water Supply - Kathleen Romero	617-292-5727	

<http://www.mass.gov/dep/water/resources/wetlands.htm>

Information and publications about Massachusetts' Wetlands program and regulations

<http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm>

The State of New Hampshire's Department of Environmental Services Water Supply Fact Sheets. There are detailed fact sheets about types of wells, proper methods of abandonment and sealing and water quality.

<http://www.nrcs.usda.gov>

The Natural Resources Conservation Service is a Federal agency that works in partnership with the American people to conserve and sustain our natural resources.

<http://www.epa.gov/agriculture/anafobmp.html>

Agricultural Best Management Practices from the US Environmental Protection Agency



This information is available in alternative format by calling our ADA Coordinator at (617) 574-6872.

Produced by the Massachusetts Department of Environmental Protection, Drinking Water Program, Western Regional Office, 436 Dwight Street, Springfield, Massachusetts, 01103. 413-784-1100, TDD 413-746-6620. April 2001.