

# Reducing the Risk of Groundwater Contamination by Improving Hazardous Waste Management

**T**wo key steps to minimizing the pollution potential from farm, household and shed wastes on your farm are to minimize the amount of wastes and to recycle when possible.

Some hazardous materials, such as lubricating oils or solvents for cleaning metal parts, are an unavoidable part of farm life. Take time to examine activities that involve using hazardous materials to be sure that you really need all the products you are using. Keep in mind that hazardous waste generated from farm business activities must be managed according to state and federal rules.

When you are certain that you are buying and using only essential products, consider how to use the products safely, recycle or reuse them when possible and dispose of remaining products in a way that will not pose a risk to your drinking water. A few simple management principles apply in every situation:

- Use hazardous products away from your well (300 feet or more), even when all your spills and drips will be contained.
- Dispose of pesticide-container rinse water by spreading on fields at the proper application rate for the pesticide.
- Contain any unusable wastes, spills and drips for appropriate disposal.

## Farm and household trash

This category of potentially hazardous substances includes:

- Ash and sludge from burned farm, home and garage trash and waste oil
- Plastic wraps and containers from farm and household chemicals, such as pesticides and paints
- Personal care products, spot removers, dry-cleaning fluids, mothballs and shoe and leather polishes
- Hobby products, pesticides used in pet care, artist paints and solvents, undiluted photography and swimming-pool chemicals and strong acids
- Home cleaning and repair products, air fresheners and pest strips, furniture and wood polishes and waxes, lead-based paint, other paints, stains and finishes, paint and finish preparation products and wood-preserving products
- Farm-business hazardous waste, including unusable or waste cleaners, solvents, pesticides and other hazardous chemicals that are generated from

cleaning, maintaining or general use of farm equipment or farming procedures

Due to the rural location of farms, many farmers have traditionally disposed of their wastes on-site. Common disposal methods have included open air, barrel or domestic incineration of garbage and trash or simply piling or burying trash in a ditch on the “back 40.”

Health concerns, toxicity and the increased volume of waste guarantees that a new approach to disposal practices is necessary to ensure that safe drinking-water supplies are available for farm families and their neighbors.

Local, state and federal laws also reflect the increased concern with many disposal practices. For example, new rules require that environmentally protective conditions be met before some disposal practices are permitted.

Other previously common disposal practices are now illegal because of their potential risks to human health and the environment.

This approach suggests several changes in traditional practices:

- Eliminate the typical farm burning site for all but a limited number of needs. Stop disposing of trash on the farm, with the exception of organic waste that can be composted, such as household garbage, leaves and straw.
- Take uncontaminated trash to a recycling facility, a licensed landfill or a municipal incinerator.
- Separate household hazardous waste from general trash and save it for a hazardous-waste collection program where available. If not available, follow approved alternative-management recommendations. Some farm hazardous wastes may be stored for a hazardous-waste collection program. Others, such as banned products, may need special consideration or pickup by a licensed hazardous-waste contractor. More information is available in the Resources section.

Household hazardous waste is excluded from hazardous-waste management regulations and often is included with regular trash disposal. But neither household hazardous waste nor hazardous waste from the farm business can be disposed of safely in a “pollution-free manner” on the farm site. If you dispose of hazardous wastes from the farm business on-site, you’re violating state law.

## Household waste vs. farm-business waste

Household quantities of hazardous wastes are exempted from regulation under state and federal law. You may dispose of these wastes safely at household hazardous-waste collection events sponsored by some communities. Small quantities of hazardous waste were banned from landfills beginning Jan. 1, 1994.

For information about locations and dates of collection events, call your regional or state Department of Natural Resources (DNR) office.

Hazardous waste from the farm business must be disposed of with a permitted hazardous-waste disposal contractor. For more information about hazardous-waste contractors, contact the hazardous waste section of your regional or state DNR office.

### Burning

Researchers estimate that ground-level concentrations of dioxin due to burning household trash in a burn barrel are 7,000 times the amount formed during trash burning in a municipal incinerator. Ash and sludge resulting from on-farm burning also contain significant amounts of toxic substances, such as lead, cadmium, chromium, dioxin and furan compounds.

Waste oil, if uncontaminated with other solvents, can be burned in a furnace designed to use oil as a fuel. Contain and dispose of any resulting ash or sludge in a licensed landfill. Waste contaminated with solvents may be a hazardous waste and, if so, must be managed properly. Check with the Missouri DNR for specifics on burning waste oils.

No specific design standards exist to adequately protect the environment from air pollution or groundwater contamination resulting from burning and ash disposal of wet trash, plastic product containers, waste oil and other hazardous products used on the farm.

The typical operation at open-burning sites, burn barrels and domestic incinerators is not adequate for burning at the temperatures required to eliminate the production of toxic substances, such as dioxin compounds, chlorine products, solvent vapors and a residue of heavy metals.

Although burning may destroy some toxic substances, others will become concentrated in the smoke, ash and sludge that result from burning wastes. Repeated burning on the same location under similar weather conditions may cause the toxic substances in smoke — especially heavy metals such as lead, mercury and arsenic — to accumulate in a concentrated area around the burn barrel. These substances, as well as the toxic substances in ash and sludge disposed of through land-spreading or burial, also could result in groundwater contamination.

Open burning of dry combustibles in small amounts is appropriate where it is permitted by local ordinance. Dry combustibles include clean, untreated, unpainted wood,

paper and cardboard. Burn dry combustibles outdoors or in a well-ventilated area to minimize adverse health effects from smoke.

**Do not burn empty pesticide bags.** If they must be burned, burn them well away from people, pets and farm stock because air will carry pesticide particles from the fire. Burn in small quantities and only on fields where the pesticide was applied.

## Building- and wood-maintenance cleaners and chemicals

This category of potentially hazardous substances includes:

- Solvent-based building and wood cleaners, including wood polish and products for wood floor and panel cleaning. (Detergent-based cleaners do not pose a threat to groundwater.)
- Equipment-maintenance products, such as stripping and finishing products, stains and paints, products for cleaning brushes or spray guns and adhesives such as glues and caulk. Also includes solvents used in degreasers and paint thinners, stains and varnishes and wood-preservative compounds.

Disposing of these products by dumping them on the ground or in a septic system could allow hazardous elements to leach into groundwater. If you use these products for farm business, then dispose of them on your farm, you're breaking the law. Avoid on-farm disposal of these liquids whenever possible.

For information about proper septic system management, see MU Extension publication EQ680, *Reducing the Risk of Groundwater Contamination by Improving Household Wastewater Treatment*.

The best disposal method for these products is to use up leftovers or share unused products with others. Dispose of any remaining hazardous liquid or sludge with a hazardous-waste contractor. Dispose of solids from evaporation of latex-based products in a licensed landfill. Some products, such as paint thinners, can be filtered and reused. Other products, such as wood preservatives and lead-based paints, need to be labeled and saved for disposal by a hazardous-waste contractor or a household hazardous-waste collection program. For more information on disposal of products, contact your county MU Extension office or regional Missouri Department of Natural Resources office.

Because of the volume of these products used on the farm, even spills and drips can add up to a problem for groundwater. Avoid maintenance activities within 300 feet of your well. Generally, conduct maintenance in a location where you can contain spills and drips.

## Leftover or unusable pesticides and container disposal

This category of potentially hazardous substances includes all types of pesticides and pesticide containers, including those used for indoor plants and yard care.

Handle all categories of pesticides as directed on the label to prevent health and environmental problems. Pay particular attention to pesticides classified as “restricted use.” Pesticide labels and regulations concerning their use often change over time. **Remember that pesticides might not have current warning labels, and some may have been banned since the time you purchased them.**

The only acceptable management practices for pesticides are to use the pesticide according to current label directions or arrange for disposal with a hazardous-waste contractor. When the U.S. Environmental Protection Agency (EPA) bans a pesticide, it sometimes provides a “buy-back” and disposal program for a specified time period. Pesticides purchased in mini-bulk tanks or returnable containers allow you to return excess chemical to the cooperative or retail store. For leftover pesticides you can’t dispose of in any of these ways, store them safely until you can dispose of them through a community hazardous-waste collection program or a hazardous-waste contractor.

Pesticide waste includes empty pesticide containers, as well as leftover pesticides. Pesticides come in mini-bulk tanks 3- to 5-gallon plastic containers or paper containers. Return mini-bulk tanks to the place of purchase when you complete application. You can return some five-gallon plastic containers to the place of purchase. Bundle paper containers and take them to a licensed solid-waste facility. Check with your local cooperative or retail store to learn whether they’ll let you dispose of containers there.

If you cannot return plastic containers to the place of purchase, triple-rinse the containers, return the rinse water to the spray tank and apply, following labeled instructions. Take the rinsed containers to a licensed landfill.

Some landfills, however, because of liability concerns, will not accept even triple-rinsed containers. Triple-rinsed pesticide containers may still contain enough pesticide residue that they should not be used for any other purpose. If you cannot dispose of pesticide containers at the nearest landfill, contact your regional DNR office or the Missouri Department of Agriculture for the nearest disposal site.

For more information about the management and storage of pesticides on the farm, see MU publication EQ676, *Reducing the Risk of Groundwater Contamination by Improving Pesticide Storage and Handling*.

## Vehicle maintenance chemicals

This category of potentially hazardous substances includes:

- Vehicle-maintenance products, such as antifreeze, oil and grease
- Solvents for oil and grease removal/disposal

- Engine, parts and equipment cleaners
- Lubricants
- Rust removers
- Paints and paint-preparation products
- Brush or spray-gun cleaners
- Lead-acid battery replacement
- Gasoline and diesel fuel

Solvents used for cleaning metal parts, oils and fuels may include hazardous toxic ingredients. Fortunately, good recycling opportunities exist for both solvents and waste oil. Consider contracting with a solvent recycler to rent a parts washer. Old solvents are picked up by the recycler, who gives you clean solvent. To recycle waste oil, take it to a gas station, service center or county highway department office that recycles waste oil and will take oil from farmers and homeowners. At least one such office usually exists in every county.

Solid- and hazardous-waste laws prohibit land-spreading of waste oil for dust or weed suppression. Waste oil can be burned in a certified waste-oil burner if the oil has not been contaminated with solvents or other materials. The waste-oil furnace should be placed according to building-code requirements.

Use up old fuels (leftover quantity stored for several months) whenever possible. Filter out contaminants and dilute one-part old fuel with five-parts new fuel to protect your engine. Wear protective clothing to prevent fuel from splashing on you during the procedure.

Do not dump antifreeze into your own drain if you have a septic tank. It may kill the organisms that the system depends on to break down wastes in the tank. Check your area for antifreeze recycling centers.

If you find yourself painting a lot of vehicles or other farm equipment, use a paint booth. Some booths are structured to collect excess paint and spray-gun cleaners for later disposal with a solvent recycler. Note that filters used with a paint booth must be considered a hazardous waste when discarded.

The design and location of the equipment-maintenance area is important. Some farmers use a grease pit. Others allow drips and spills to collect on the shed floor. In both cases, the area is typically cleaned through periodic flushing. If you prefer to keep your shed floor clean through flushing, you will need a system to hold waste liquids so that they will not be flushed onto soil. Flushing to a paved outdoor area is an acceptable method of disposal. Using sawdust to soak up drips and spills is another common practice. Evaporate volatile chemicals in a protected outdoor area with good ventilation, and take the sawdust to a licensed landfill. Burning any of these substances can produce air-emission deposits that can contaminate groundwater.

Evaporation of liquid wastes prior to flushing may take care of the problem of contaminated runoff, but it is not recommended because of air-quality concerns and the potential for liquids to seep through floor cracks. Flushing is one of many waste-management methods used in the

past that should be re-evaluated to determine whether it is worth the risks of environmental contamination.

## Storing chemicals and hazardous wastes

You sometimes may have leftover or used chemicals, such as waste oil and solvents, that need to be stored until disposal. Place the storage area for these chemicals and their wastes at least 300 feet from your well. Dike storage areas to prevent well contamination from spills if the volume of the stored products and wastes exceeds 10 gallons.

Store chemicals in clearly labeled containers designed to contain the specific hazard category — flammables, poisons or corrosives. Provide a well-ventilated area away from sources of heat, spark or flame, with sturdy shelving for storing labeled containers in the building where you commonly use them. When choosing the storage location, keep indoor air quality, safety and flammability in mind. Be sure that the area is adequately vented to prevent buildup of fumes from leftover products. As a rule, if you can smell your products, ventilation is inadequate to protect your health. Also, be sure that the storage area provides a means to segregate flammables, explosives, poisons and corrosive wastes to minimize accidental release due to chemical interactions. Make sure storage is inaccessible to children.

Collect hazardous wastes generated in the course of maintaining farm equipment, such as solvents and parts washer solution, and place in closed containers. Label the containers with the words “hazardous waste,” the name of the waste and the date the waste was put into the container.

Hazardous wastes generated from household vehicle maintenance should be stored safely until they can be taken to a household hazardous-waste collection site. Evaporation of household hazardous wastes is not recommended because of the potential for spills, contact by children and fire. Use evaporation only when no household hazardous waste collection program is available. If you’re not sure whether a particular waste is hazardous, contact the hazardous waste section of your regional or state DNR office.

When storing wastes and products outside, especially liquids, place them on bermed surfaces built of materials that will contain any spills. For example, you may store batteries in a plastic-lined area, but some solvents could dissolve a plastic liner. Spilled solvents also may penetrate concrete or asphalt if they are not cleaned up quickly.

Store flammable chemicals and batteries in an area shaded from direct sunlight. Rags used to clean up solvent spills also may be a fire hazard. Store them with the same care as hazardous materials, such as in fireproof containers in a storage area. Dispose of as hazardous material.

Inspect all storage areas regularly for spills or leaks, proper labeling and to see that containers are in good condition, closed and not bulging. For more information on proper storage methods, contact the hazardous waste section of your state or regional DNR office.

## Laws regulating waste disposal from farms

Disposing of hazardous wastes from farms is regulated under federal and state law.

The Resource Conservation and Recovery Act (RCRA) Subtitle D provides restrictions for land burial of trash that doesn’t fall into hazardous-waste categories. Open burning and on-farm incineration of trash and on-farm burial of containers and other trash are regulated in Missouri under the Missouri Solid Waste Management Law, Revised Missouri Statutes, Section 260.200 through 260.345 (RSMo 260.200–260.345)

Under federal hazardous-waste regulations, farms may be considered “conditionally exempt.” States use terms to refer to categories of waste generators that may not be the same as federal terms. Contact the Missouri DNR for more information. An operation is “conditionally exempt” if it accumulates less than 2.2 pounds of acutely hazardous waste or less than 220 pounds of hazardous waste per month. “Conditionally-exempt” operations are not required to get an EPA identification number or a manifest form for disposal, but they still must deliver their wastes to a licensed hazardous-waste facility.

“Acutely hazardous” and “hazardous” wastes are listed in federal and state regulations. Aldicarb and heptachlor, for example, are acutely hazardous pesticides.

A word of caution: Because some pesticides commonly used by farmers are listed as acutely hazardous waste in federal statutes, farmers with leftover pesticides may not be “conditionally exempt.” Farmers who accumulate more than 2.2 pounds of acutely hazardous waste need to get an EPA identification number and use the manifest system to dispose of those wastes.

In Missouri, these conditionally exempt generators are designated as small-quantity generators and are regulated by state law.

Disposal of veterinary medical wastes might present a problem on some farms. Ask your veterinarian for advice on specific wastes, such as antibiotic containers. DNR regional offices can provide information about regulations that might affect medical-waste disposal.

## Resources

For information about health concerns related to hazardous waste disposal, contact the Missouri Department of Health and Senior Services, Bureau of Environmental Epidemiology, 866-628-9891 or 573-751-6102, [info@health.mo.gov](mailto:info@health.mo.gov), <http://health.mo.gov/living/environment/hazsubstancesites/>.

For information about specific products, contact the company that makes the product. Also, for information about resources and solutions for hazardous materials and dangerous goods response, contact CHEMTREC, 1-800-262-8200, [chemtrec@chemtrec.com](mailto:chemtrec@chemtrec.com). A 24-hour emergency information and response line is 1-800-424-9300.

For information on petroleum product spills, contact the Missouri Department of Natural Resource's Hazardous Waste Program, 800-361-4827 or 573-751-3176, <https://dnr.mo.gov/env/bwp/>; your county MU Extension office; or a regional DNR office listed below:

- Kansas City — 816-251-0700
- Northeast (Macon) — 660-385-8000
- Southeast (Poplar Bluff) — 573-840-9750
- Southwest (Springfield) — 417-891-4300
- St. Louis — 314-416-2960

For information about pesticides and other agricultural chemicals, contact the Missouri Department of Agriculture, Plant Industries, Bureau of Pesticide Control, 573-751-5504. <http://agriculture.mo.gov/plants/pesticides/>

For questions about human poisoning, contact your physician or the Missouri Regional Poison Control Center at 800-366-8888.

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Farm•A•Syst: Farmstead Assessment System Fact Sheet: This guide, previously named MU publication WQ679 *Reducing the Risk of Groundwater Contamination by Improving Hazardous Waste Management*, was originally produced as part of the Missouri Farmstead Assessment System — a cooperative project of MU Extension; MU College of Agriculture, Food and Natural Resources; and the Natural Resources Conservation Service — and was adapted from Wisconsin and Minnesota prototype versions of Farm•A•Syst.

#### ALSO FROM MU EXTENSION PUBLICATIONS

- EQ676 *Reducing the Risk of Groundwater Contamination by Improving Pesticide Storage and Handling*
- EQ680 *Reducing the Risk of Groundwater Contamination by Improving Household Wastewater Treatment*
- G7520 *Pesticides and the Environment*

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