

## GARAGE

Never pour gasoline or motor oil onto the ground, into a storm drain, or into your septic system. One gallon of oil can contaminate a million gallons of water.

Also, motor oil picks up heavy metals, such as lead, as it circulates through a vehicle's engine. If you change your vehicle's oil yourself, store used oil in a sturdy, well-marked container. Take it to a gas station or a business that recycles motor oil.

Antifreeze contains either ethylene glycol, a substance poisonous to humans and pets, or the less toxic propylene glycol. If you have a septic tank, do not pour antifreeze down the drain as it can kill the beneficial organisms in the system.

Diluted antifreeze can be processed by some community sewage treatment plants, but check with your system operator first.

## KITCHEN/BATH

Products, such as furniture polish, metal polish, and nail polish remover, should never be poured down the drain or placed in the garbage. It is safe to place empty oven cleaner containers in the garbage.

## BATTERIES

Dry cell batteries for use in portable radios or remote controls often contain mercury or cadmium. Batteries should never be thrown in the trash. Use rechargeable batteries or electrical adapters when possible.

Automobile and other wet cell batteries often contain lead and sulfuric acid. These batteries can be recycled.

Efforts have been made to ensure the accuracy of the information on this poster; however, this information MUST be used in accordance with local regulations. Please contact your local health department for information about regulations in your community before disposing of any hazardous substances.

# Groundwater Protection...



GARAGE



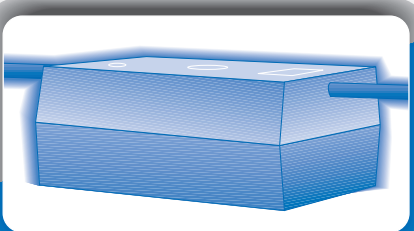
KITCHEN/BATH



PAINT



INSECTICIDE/FERTILIZER



SEPTIC TANK



BATTERIES

Unsaturated Zone

Water Table

Saturated Zone (Aquifer)

Bedrock

When rain and snow fall, some water flows into streams, lakes, and oceans, and becomes surface water. Most precipitation, however, either evaporates or seeps deep into the soil, eventually becoming groundwater.

Water is the universal solvent, picking up pollutants on its way to the aquifer from which we draw our drinking water.

Some contamination can be traced to hazardous substances we use around our homes. If dumped down the drain, flushed down the toilet, or poured on the ground, these substances can contaminate the groundwater supply, and once an aquifer is polluted, it is expensive and difficult to clean up.

If you purchase products containing hazardous substances, buy only as much as you need, and use it up completely, give it to someone else to use, or save it for hazardous waste collection.

A comprehensive story on household hazardous waste is on the back of this poster.

# BEGINS AT HOME

## PAINTS

Oil-based paint consists of pigment and solvents, such as petroleum distillates, that are hazardous substances. If paint has completely dried in its container, it may be put in the garbage. Don't rinse paint brushes and containers where wastewater can run into a storm drain.

Whenever possible, use latex paint that has a water-based solvent.

## FERTILIZERS/ PESTICIDES

Be very careful using, handling, storing, or disposing of pesticides and fertilizers. Most chemical pesticides contain toxic substances that can result in both immediate and long-term health effects. Whenever possible, use organic compost material.

## SEPTIC TANK

Leaky or faulty septic tanks are one of the most common sources of groundwater contamination. Do not pour hazardous or toxic waste down drains or toilets. Even small amounts can destroy the biological system that breaks down waste, then drain out into the groundwater. Make sure your septic tank is routinely inspected and pumped out, if necessary. Do not drive over the tank or the adjacent absorption field.



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The National Drinking Water Clearinghouse is funded by the Rural Utilities Service.

# Groundwater Protection...

In your garage or basement right now, you probably have a few containers of paint, maybe some lawn fertilizer, and possibly a jug of antifreeze. Elsewhere in your house, you may have nail polish, a can of bug spray, and spent batteries.

Sooner or later, you'll need to dispose of these and other household products that may contain hazardous or toxic substances. In fact, the U.S. Environmental Protection Agency estimates that the average American disposes of approximately one pound of such waste each year. If dumped down the drain, flushed down the toilet, or poured on the ground, these substances can contaminate the groundwater supply as well as your drinking water or your neighbors' drinking water.

## What is groundwater? How is it contaminated?

When rain and snow fall to earth, some of the water flows into streams, lakes, and oceans. This is called surface water. Much precipitation evaporates while the remainder seeps into the soil eventually becoming groundwater.

Water first seeps into the "partially-saturated zone," or "vadose zone," directly below the surface, where water and air pockets fill the voids in the soil. As the water seeps farther into the ground, it may reach the "aquifer." An aquifer can be defined as a geologic formation where water collects in quantities sufficient to support a well or spring. All void areas are filled with water. The point where the partially-saturated zone meets the aquifer is the "water table."

Aquifers are often tapped with wells to provide water for a single household or an entire community. Groundwater supplies 35 percent of the water for urban areas of the country and 90 percent of the water in rural areas, according to the U.S. Environmental Protection Agency (EPA).

In addition to water, pollutants can enter an aquifer from landfills, pesticide and fertilizer use, mining and industrial waste, sewage treatment plants, and failing septic systems. Contamination also can be traced to hazardous substances used around the house.

Unfortunately, once an aquifer is polluted, cleanup can be difficult and costly.

## The Hazardous Products

"The best place to start taking care of the planet is on our own homes," said Sarah Dewey of the Household Hazardous Waste Project, part of the University of Missouri Extension System. "Pay attention to the things you bring into the home."

Dewey said consumers should read product labels before buying to determine what substances they contain. When buying a hazardous product, buy only as much

as you need. This will eliminate the need to dispose of excess amounts. She says consumers should also consider purchasing safer, alternative products whenever possible.

"Hazardous products are hazardous not only when you dispose of them, but in their production, use, and storage," Dewey says. In addition to being potentially harmful to the outside environment, they also can threaten your own indoor environment.

The remainder of this article deals with the types of hazardous materials used around the house, why they are dangerous, and how to dispose of unwanted amounts.

**Information on this poster may not be applicable to every community as regulations and environmental conditions vary. Check with your local wastewater treatment plant operator or county solid waste official before disposing of any hazardous substance.**

## Garage



We use many hazardous substances around the garage to maintain our automobiles and lawn mowers. But stored or disposed of improperly, these products can contaminate our drinking water sources and lead to health problems.

As **motor oil** circulates through a vehicle's engine, it picks up heavy metals, such as magnesium and lead. If dumped onto the ground or into a storm drain, used motor oil can contaminate the environment and possibly the local drinking water supply. One gallon of oil can contaminate up to one million gallons of water, according to the EPA. If you change your vehicle's oil yourself, store the used oil in a well-marked, sturdy container and take it to a gas station or a business that recycles motor oil.

Most **antifreeze** contains either ethylene glycol, which is poisonous, or propylene glycol. Do not mix the two products. Also, dumping antifreeze on the ground can be a hazard to pets, which are attracted to the sweet taste. (Several brands of antifreeze now include a bitter-tasting additive.) Where available, recycling is the best disposal option for used antifreeze.

If your house is served by a septic system, do not pour antifreeze down the drain because it can kill the beneficial organisms in the system. Antifreeze can be broken down in some community sewage treatment plants. Consult your local plant operator for approval, then flush the antifreeze down the toilet in small, well-diluted doses.

Automobile and other equipment **batteries** often contain lead and sulfuric acid. Improper disposal can create an environmental hazard. Dead batteries can be recycled, and many stores even pay customers a small amount for turning in old batteries when buying new ones.

## Kitchen and Bath



Many kitchen and bathroom cleaning products can be safely disposed of by pouring them down the drain with plenty of water or placing them in the garbage.

**Window cleaners, drain cleaners, disinfectants, and toilet bowl cleaners** can all be poured down the drain if diluted. Dump only in small amounts, especially if your house has a septic system. (Some products should never be mixed. For instance, never mix products containing bleach with those containing ammonia.)

Empty **oven cleaner** containers can be placed in the garbage. Other kitchen and bath products, such as **furniture polish, metal polish, and nail polish remover**, should never be poured down the drain or placed in the garbage. They may contain petroleum distillates and other hazardous substances. These products should be used completely, given to someone who can use them, or saved for a community hazardous waste collection.

There are many alternatives to hazardous household products. A number of organizations provide lists of alternative, safer products. The Penn State University Cooperative Extension, for instance, recommends a mixture of baking soda and water to clean silver.

## Paint



Paint consists primarily of pigment and solvent. While latex paints use water as a solvent, other types of paint may include solvents, such as naphtha and xylene. Latex paints, however, may also contain other toxic substances, such as ethylene glycol or acetate.

As with other potentially hazardous products, paint should be used completely or given to someone who can use it. If the paint has completely dried in its container, it may be put in the garbage. (Dried paint can be handled as a solid waste instead of as a liquid waste.) The only safe disposal of unusable liquid paint is through a community hazardous waste collection or paint recycling facility.

It is also important not to rinse paint brushes and containers where the wastewater can run directly into a storm drain. Using latex paint eliminates the need for harsh chemicals to clean brushes and work areas.

## Pesticides and Fertilizers



Extra care should be taken when handling, storing or disposing of pesticides and fertilizers. Follow product directions carefully or consult your county extension agent for advice.

Many **pesticides** contain chemicals—methoxychlor, dalapon, and others—designed to kill insects and rodents. Some are also harmful to humans and pets. Aside from using all of the product properly or giving leftover products to a friend, the only safe disposal of pesticides is through a community hazardous waste collection. Human exposure to pesticides can result in both immediate and long-term health effects.

In addition to the actual pesticide, some pesticide products include inert ingredients, which also can be hazardous. One such hazardous inert ingredient, according to the Household Hazardous Waste Project, is methylene chloride, which can cause cancer in humans.

When possible, try a safer alternative. Boric acid, for instance, is less toxic and can be used to kill ants and roaches; however, boric acid must not be placed where children or pets might have contact with it.

**Chemical fertilizers** contain large amounts of phosphorus and nitrogen that can drain into nearby streams, possibly killing fish, or leach into the ground and enter the aquifer. Excessive nitrogen in drinking water can lead to methemoglobinemia (blue baby syndrome).

Whenever possible, use organic compost material, natural pesticides, or integrated pest management instead of chemical fertilizers and pesticides.

However, Patricia Miller, Ph. D., former research assistant professor with the National Small Flows Clearinghouse at West Virginia University, said these natural pesticides still need to be used in minimal amounts and according to the product instructions. "Many of these still are poisonous, even if they are natural," Miller said.

## Batteries and Other Products



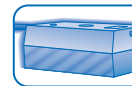
Dry cell **batteries**, for uses such as portable radios and remote controls, often contain mercury or cadmium. Cadmium has been linked to kidney disorders and other ailments. Batteries should never be thrown in the trash. They should be saved for a community hazardous waste collection.

The Household Hazardous Waste Project recommends the use of electrical adapters for electronic products whenever possible. When batteries must be used, the group recommends rechargeable batteries.

Commercial **shoe polishes** may contain substances, such as nitrobenzene and methylene chloride, that are suspected of causing cancer in humans. Wear gloves when applying polish. Dry shoe polish can be placed in the trash, but it is preferable to use it up instead.

As with shoe polishes, **model glues, rubber cement**, and other strong adhesives should be completely used instead of throwing them away. Most glues should be saved for a community hazardous waste collection, but if the glue has completely dried in its container, it can be placed in the trash.

## Septic Tank



One common source of groundwater contamination is leaky or faulty septic systems. This is often caused by lack of maintenance—septic tanks should be inspected every three to five years and pumped if necessary; otherwise the tank and field may plug, causing overflows that can reach aquifers through cracks and fissures.

Individuals can prevent problems by carefully guarding what enters the septic system. Do not pour hazardous materials down drains or toilets. Even small amounts of paints, varnishes, pesticides, and other

organic chemicals can destroy the biological system that breaks down waste. These products then seep out of the septic system, contaminating the groundwater.

Avoid septic tank cleaners, especially those with acids and solvents, such as trichloroethylene (TCE). To prevent damage to the system, do not drive over the tank area or the adjacent absorption field.\*

## You Can Help Protect the Groundwater

There currently may not be an alternative to products, such as motor oil, but you can handle and dispose of these products safely and try alternatives for potentially hazardous household cleaning products and pesticides.

If you have questions about whether a substance is toxic or how to dispose of it, contact your county extension office, which is typically affiliated with the land-grant university in your state. Help may also be found by calling your county's health department, wastewater treatment plant, garbage collection service, or landfill.

The graphic on the other side of this poster can help you identify ways to protect your groundwater supply.

## Assisting Small Communities . . .

### The National Drinking Water Clearinghouse

Located at West Virginia University, the National Drinking Water Clearinghouse (NDWC) is funded by the U.S. Department of Agriculture's Rural Utilities Service to assist communities of fewer than 10,000 people and those who work with them to provide safe drinking water.

The NDWC serves these communities by collecting and developing timely information relevant to drinking water issues, then disseminating this information through its various services. These services include:

- **On Tap**, a free quarterly publication that addresses technical, educational, health, and operations and maintenance issues relevant to community drinking water systems;
- **Water Sense**, also a free quarterly publication, which focuses on financial resources and management strategies for efficient water and wastewater system operation;
- a World Wide Web site, which includes the latest issues of the newsletters above, along with educational product listings, "water facts," discussion areas, and links to other relevant organizations;
- a toll-free technical assistance and referral line (1-800-624-8301), which is staffed by engineers and technical assistants to provide information about regulations, technologies, funding sources, local assistance contacts, and other drinking water-related issues;
- approximately 200 free and low-cost educational products, ranging from children's educational posters to federal regulatory documents to training videotapes; and
- several databases, including the Registry of Equipment Suppliers of Treatment Technologies for Small Systems, or "RESULTS," which houses information about small drinking water technologies in use across the country, and a bibliographic database that includes abstracts of relevant articles from trade and scientific journals, research papers, and government documents. The NDWC also maintains information about water equipment manufacturers and other drinking water-related organizations.

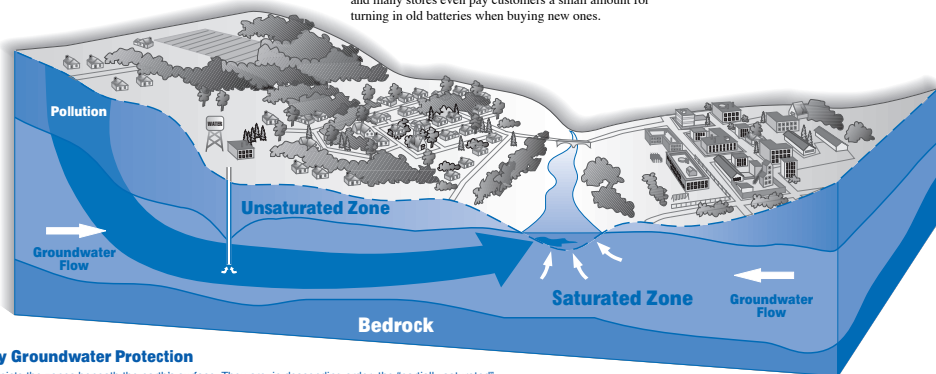
All of the informational resources discussed above are available for free or at a minimal cost. For more information about the National Drinking Water Clearinghouse, call (800) 624-8301 or (304) 293-4191 and request a free information packet, or visit the NDWC's Web site at <http://www.ndwc.wvu.edu>.



This poster was prepared by the National Drinking Water Clearinghouse, a partner in the National Drinking Water Alliance, for inclusion in the 1998 Blue Thumb packet. For more information, or to order additional copies, call (800) 624-8301.

\* For additional information on septic systems, contact the National Small Flows Clearinghouse at (800) 624-8301.

Sources: U.S. Environmental Protection Agency, the Household Hazardous Waste Project of the University of Missouri Extension Service, and the Penn State University Cooperative Extension.



## Community Groundwater Protection

This diagram depicts the zones beneath the earth's surface. They are, in descending order: the "partially saturated" or "unsaturated zone"; the "saturated zone," which contains the aquifer; and "bedrock."

Groundwater is drawn from the aquifer to a municipal treatment facility where it is tested, treated, and stored in a water tank above the town until needed.

Pollution entering the soil in the upper left from sources, such as landfills, leaky septic systems, underground storage tanks, or home lawn care, can contaminate the aquifer and any associated community or individual wells.

Like surface water, groundwater is constantly on the move. Groundwater, however, moves very slowly—from feet per day to inches per year depending on the type of soil and rock. What is poured on the ground today can end up in drinking water many years later.

Groundwater commonly discharges to the surface in streams and springs, and a contaminated aquifer can thus pollute surface water supplies.

# BEGINS AT HOME