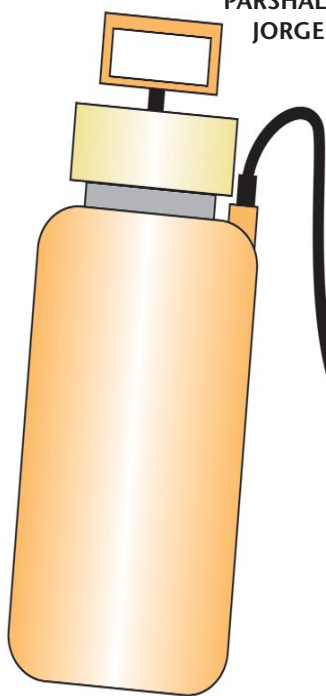




HOUSING & ENVIRONMENT

THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION SERVICE

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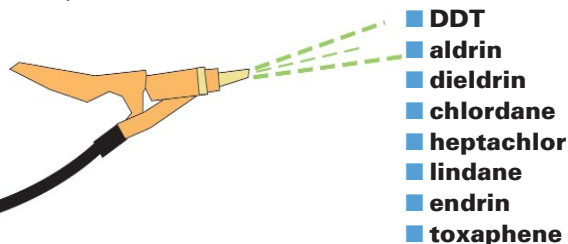


YOUR HOUSEHOLD WATER QUALITY: PESTICIDES, SOLVENTS, AND PETROLEUM PRODUCTS

PESTICIDES AND SOLVENTS

Modern pesticides include a diverse number of compounds, grouped according to the pest they control (such as their names imply): insecticides, miticides, nematocides, herbicides, plant growth regulators, fungicides, bactericides, etc. The first pesticides contained toxic metals such as arsenic, mercury, copper, and lead, but these were seldom used after World War II and rarely appear in groundwater today.

Solvents include a number of organic liquids that are used in a variety of household products such as paint, cleaners, degreasers, and other applications. The most dangerous solvents often contain a chlorine atom and are usually referred to as *chlorinated hydrocarbons*. This class of solvents includes compounds such as carbon tetrachloride and methylene chloride. Some pesticides are also chlorinated hydrocarbons. They include:



Chlorinated hydrocarbons have low solubility in water and a strong tendency to attach to soil particles, thus rarely contaminating groundwater. Originally they were thought to be safe for the environment; later they were discovered to accumulate and build up to toxic concentrations in the food chain. The use of many of these pesticides has been restricted, suspended, or cancelled.

Organophosphorus compounds such as malathion, diazinon, and parathion are one group of pesticides that replaced chlorinated hydrocarbons. Although some are highly toxic to humans, they generally break down rapidly in the environment and are rarely found in groundwater.

Carbamates are a group of pesticides that include aldicarb, carbofuran, and oxamyl. These compounds tend to be soluble in water and weakly attached to soil. Thus, if they are not degraded in the upper soil layer, they can migrate to groundwater. The most significant occurrences of groundwater contamination are from carbamate pesticides.

There are many other groups of pesticides too numerous to describe in detail. These include:

- synthetic pyrethrins (Pydrin)
- benzoic acids (Dicamba)
- thiocarbamates (Eptam)
- phenoxies (2, 4-D, Silvex, MCP)
- dinitroanilines (Balan)
- substituted aromatics (Daconil)
- triazoles (Bayleton)
- organotins (Super-Tins)
- triazines (atrazine)
- phthalic acid (Dacthal)

The potential for any of these or other groups of pesticides to contaminate groundwater is dependent on the chemical properties of the compound and its movement through soil and/or water.



Gasoline is especially hazardous because it contains benzene, a cancer-causing compound.

PETROLEUM PRODUCTS

Petroleum products include the various compounds that are refined from crude oil, coal, and natural gas. The most common petroleum products are gasoline, kerosene, diesel, fuel oil, and road oil. Generally, the lighter petroleum products, such as gasoline, move faster through soil and sediment and thus are more prone to contaminate groundwater. Gasoline is especially hazardous because it contains benzene, a cancer-causing compound. Leaking underground storage tanks, leaking pipes, and other types of spills are the leading causes of groundwater contamination by petroleum products.

WHAT CAN I DO TO PREVENT GROUNDWATER CONTAMINATION?

Pesticides, solvents, or petroleum products used as intended, according to directions on the label, rarely contaminate groundwater. However, misuse of these chemicals (such as pouring gasoline on fire ant mounds) can cause groundwater contamination. In addition, areas where chemicals are stored, mixed, or spilled are also very prone to contamination. Shallow and improperly constructed wells are especially vulnerable to contamination because of the potential for surface run-off and spills to make their way into your water supply. For more information about how to safeguard your well, see "Protecting Your Well and Wellhead, Circular 858-1" in The University of Georgia Household Water Quality Series.

WHO IS RESPONSIBLE FOR TESTING MY WATER SUPPLY?

Municipal water systems are required by law to be monitored for many contaminants found in pesticides, solvents, and petroleum products. However, if your water comes from a private well or from a system that serves fewer than 25 people or has fewer than 15 connections, it is not regulated under these laws. The safety of water from these sources is your responsibility.

WHAT CAN BE DONE TO REDUCE THE RISK OF GROUNDWATER CONTAMINATION BY THESE CHEMICALS?

You can protect your water supply by:

- Making sure your well is properly constructed, sited, maintained, and protected.
- Preventing backflow that could contaminate your well.
- Using pesticides according to the directions found on the product label.
- Storing and mixing chemicals away from your well to prevent contamination from accidental leakage.

HOW CAN I PROTECT MYSELF FROM EXPOSURE TO THESE CHEMICALS IN MY WATER SUPPLY?

If you suspect that your water supply may be contaminated, be sure to have your water tested. Contact your county extension agent for more information. A home water treatment system can help to protect you from certain contaminants in your water supply. For more information, see "Home Water Quality and Treatment, Circular 858-3" in the University of Georgia Household Water Quality Series, or contact your county extension agent. The best means of protection, however, is to find and eliminate the source of contamination.

Activated carbon filtration will absorb and remove most of these chemicals. Special attention should be paid to the lifetime and capacity of these filters. As they become exhausted, they can release the chemicals that were previously removed.

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