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OKLAHOMA COOPERATIVE EXTENSION SERVICE

Hazardous Household Waste: Special Wastes

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Used Oil

The EPA defines used oil as: "Petroleum-derived or synthetic oil including, but not limited to, oil which is used as a lubricant, hydraulic fluid, metal working fluid, insulating fluid or coolant and which is contaminated through use or subsequent management."

More and more communities and individuals are recognizing the harmful effects of mismanaged used oil generated by do-it-yourselfers (DIYs) who change the oil in their car(s) themselves. The EPA estimates that 1.3 to 1.5 billion gallons of used oil are generated each year in the United States, and only about 67 percent of all used oil is recovered. It is estimated that do-it-yourselfers improperly dispose of approximately 200 million gallons of used oil annually. This amount equals 20 Exxon Valdez oil spills.

THE STARTLING STATISTICS

- One gallon of oil can contaminate a million gallons of fresh water. This equals a year's supply for 50 people.
- It only takes one gallon of motor oil to yield the same 2.5 quarts of lubricating oil provided by 42 gallons of crude oil.
- If 120 million gallons of motor oil were recycled, it would save the United States 1.3 million barrels of oil per day.
- Re-refining used oil takes only about 1/3 the energy of refining crude oil to lubricant quality.

The EPA recently published a manual, *How to Set Up A Local Used Oil Recycling Program,* and brochures, *Recycling Used Oil — What Can You Do?* and *Recycling Used Oil — For Service Stations and Other Vehicle-Service Facilities.* These materials are available to government, civic, and other groups to assist in setting up programs for DIY oil collection. To obtain a free copy of the manual and brochures, call the EPA's RCRA/Superfund Hotline at (800) 424-9346, or The Oklahoma Department of Environmental Quality at (405) 271-7353.

White Goods

Recycling is the best option for managing white goods. White goods are items such as refrigerators, ranges, water heaters, freezers, washers, dryers, dishwashers, kitchen trash compactors, window unit air conditioners, etc. Scrap metal dealers can recover the metal and resell it. Prices of scrap metal vary across the state depending on product quality and quantity.

The quality of scrap metal is affected by the presence of contaminants from motors and capacitors. Motors contain non-ferrous metals, an undesirable part of the final product. Some capacitors may contain PCBs. EPA studies indicate that only a few capacitors manufactured after 1979 contain PCBs. Capacitors with PCBs are most likely to

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appear in air conditioners, heat pumps, furnace blowers, fluorescent lighting ballast and microwave ovens manufactured before 1979. A limited number of refrigerators and freezers prior to 1979 may also have capacitors with PCBs. These PCB capacitors should be disposed of in an EPA approved waste management facility. Currently, no facilities are located in Oklahoma which are approved to dispose of PCB wastes. When developing a white goods collection program, a variety of groups need to be involved including local and regional government units, recycling coordinators, interested citizens, scrap metal dealers, and other concerned parties. Scrap metal dealers are a vital part of the management process. They can provide a market, and they may already have a collection and transportation system in place to use. Check the yellow pages for scrap metal and junk dealers in your area.

Batteries

There are several kinds of batteries in common use today: automotive and marine batteries (wet-cells); small alkaline batteries found in toys, radios, rechargeable flashlights, vacuum cleaners, and drills (dry-cells); and the very small batteries used in hearing aids, watches, computers, etc. (mercury or silver oxide). Batteries are designed to convert a chemical reaction into electrical energy. In doing so, some highly toxic and/or hazardous compounds are used or formed.

- **Wet Cell Batteries** are usually comprised of a plastic shell, consisting of usually six inner cells which contain lead strips and positive and negative lead terminals. The cells also contain sulfuric acid. In a "maintenance-free" battery, the sulfuric acid is incorporated into a gel and the cells are permanently sealed. Maintenance-free wet cell batteries are less hazardous since exposure to the user is not likely with permanently sealed cells. Many maintenance-free batteries have vent caps or plugs.
- **Dry Cell or Alkaline Batteries** consist of a moist chemical paste (either acidic or caustic) mixed with manganese dioxide. A carbon rod runs through the middle of the paste. A zinc can, or casing, surrounds the paste and carbon rod. Some batteries may have copper as part of this cell. Basically, the zinc, carbon chemical paste, and in some cases copper react to generate the electrical current. The rechargeable dry cells consist of cadmium, nickel dioxide, and a caustic paste.
- **Very Small Batteries** consist of mercury, lithium, or silver oxide. Mercury batteries are about half the size of a dime, but are about twice as thick. These consist of zinc, mercuric oxide, and potassium hydroxide contained in a metal case. The case has positive and negative poles. The normal life expectancy is about 12 months depending on their use. Mercury batteries are used in cameras. Silver oxide batteries are used in watches and cameras. Lithium batteries are used in computers and calculators. Recently, we have seen lithium batteries for more general use like cameras and flashlights.

The type of battery which poses the greatest hazard due to its constituents, size, and use in our society is the wet cell or lead storage battery. With its large quantity of sulfuric acid (a corrosive) and substantial amount of lead (a highly toxic heavy metal), improper handling or disposal of these types of batteries can have both immediate and long-term effects on people and the environment.

Dry cell batteries contain caustic chemicals and some heavy metals. Their potential hazards are not as severe as wet cell batteries, but should not be underestimated.

Mercury and silver oxide batteries each contain a toxic substance. Lithium batteries, however, pose a different hazard in that the unspent lithium in the battery is highly water-reactive.

Many consumers who have unwanted wet cell batteries, like automotive or marine batteries, often trade them in on new purchases or the battery is kept by the business that installs the new battery.

The Solid Waste Management Act of 1989 banned the disposal of lead-acid batteries in landfills or waste-to-energy facilities after January 1, 1991.

No feasible alternatives have been found to the land disposal of mercury batteries. Thus, this type of battery should be handled as a hazardous waste and landfilled in a secure hazardous waste disposal site. Because of their small size and limited mercury content, some authorities believe these batteries pose little or no threat in a sanitary landfill. Others have raised concern about the presence of these materials in municipal trash which is incinerated in a solid waste incinerator.

Silver oxide batteries can be reclaimed for their silver content. A minimum processing fee is charged for this service. It is necessary to accumulate a large quantity of these batteries to make it worth the effort. Other smelting companies most likely

will also reclaim silver from these batteries, so check the resources in your local area.

Lithium batteries are the only small batteries currently required to be treated rather than landfilled. Generally, when one of these batteries needs to be replaced, it is done either by a service person (and the battery retained), or a trade-in is requested. A treatment facility permitted to handle these batteries is:

BDT
4255 Research Parkway
Clarence, NY 14031
(716) 759-2868

With the new lithium batteries on the market, more will likely be seen in the future.

Batteries cannot be readily incinerated in solid waste incinerators if they contain metals. The incineration process merely exhaust the metals into the atmosphere.

Tires

It has been established that scrap tires represent one percent of the solid waste stream. Estimates are that it costs one dollar per tire to dispose of them.

Recycling tires is a variable option. The tires can be ground with latex to produce a durable cushioning for railroad crossings. They can be blended with asphalt for roads and tennis courts. This mix has a distinct advantage for roads in that ice will not stick to it. As cars drive over the road, the rubber moves and the ice breaks. The mixture costs 40 percent more than conventional materials, but it lasts twice as long. Waste tire chips can also be used in the leachate collection drainage layer at landfills. This is currently being used in Florida, Pennsylvania, and Oklahoma.

Tire derived fuel (TDF) is another recycling use for scrap tires. It has low moisture, ash, and sulfur content and a high BTU content. Potential customers for TDF are cement and lime kilns, pulp and paper boilers, utility boilers, and waste-to-energy plants. TDF can increase boiler efficiency and reduce the hazardous exhausts that go into the air.

Hazardous household products are widely used in the home for cleaning, automotive work, yard and garden projects, remodeling, and hobbies. They are labeled with clues as to their potential hazard, but when used and disposed of improperly, they pose significant health hazards to the environment. Special products like white goods, batteries, and automotive tires make our lives easier and more convenient. Yet when they are no longer useful, they can become a problem. How do we dispose of them without harming the environment? While it is impossible to live without hazardous products in our society, there is much we can do to reduce our dependency on them. When we must use them, we can learn to do so safely, with care and prudence.

The Oklahoma Cooperative Extension Service
Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; home economics; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective and based on factual information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

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