

Ohio Hazardous Waste

Notifier

A Publication of Ohio EPA, Division of Hazardous Waste Management

Cost Savings and Waste Minimization Opportunities for Small Aqueous Parts Washers

In the last issue of *the Notifier*, we discussed waste minimization opportunities for solvent-based parts washers. In this issue, we will look at various types of aqueous-based parts washers. Regulatory considerations for all types of parts washers are discussed in an article on page 6 of this issue.

What Are Aqueous-Based Solvents?

Aqueous-based solvents are water-based solutions and can be composed of detergents, alkaline chemicals, microbes or any combination of these. They are nonflammable and contain little or no Volatile Organic Compounds (VOCs).

How Do Aqueous-Based Solvents Work?

Instead of dissolving grease or solids, aqueous-based solvents use heat, agitation, soap action and time to break dirt into smaller particles. To use aqueous-based solvents, the parts must be able to be immersed in water without serious "flash rusting." However, there are some additives that inhibit "flash rusting."

Aqueous solutions may be used in conventional "sink-on-a-drum" parts washers. Your company also could purchase an enclosed immersion tub or open basin unit. These are available in stainless steel and range in capacity from six or more gallons.

Some routine maintenance is required on aqueous-based units. This can include:

- adding water and chemicals on a daily basis;
- skimming oil (not on microbial units); and
- replacing filters every few weeks to several months.

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Cost Savings and Waste Minimization for Small Aqueous Parts Washers

Ask the Inspector: What am I required to do before I ship my hazardous waste off-site?

How Must I Manage the Waste from My Aqueous Parts Washer?

My disposal company says my waste is exempt or excluded from the hazardous waste rules, what is my responsibility?

Annual Report Data

Lamps Puzzle

Transporter Puzzle Key

What Are the Advantages of Using An Aqueous-Based Solution?

You can:

- *Save money by reducing labor and waste disposal costs.* Labor is the greatest cost for parts cleaning. Using a spray cabinet can reduce your labor by 75 percent. Time spent cleaning can be spent on other tasks. Aqueous solutions generally last longer and don't need to be changed out as frequently as traditional solvents. Solution life span can vary depending on use. Some aqueous-based brake washing or microbial-based solutions can last for two to three years before changing out the spent solution. The life span of the solvent can be extended by oil skimming and filtration.
- *Reduce the amount of hazardous waste generated and stored on-site.* The spent solution may be able to be disposed of as non-hazardous waste. This could change your generator status (from LQG to SQG or CESQG), reduce your regulatory obligations (paperwork, training requirements, etc.) and your long-term liability. Be aware, depending on what you clean and the length of time you use the solution, that heavy metals can accumulate in the solution and cause the spent solution to be characterized as a hazardous waste.
- *Reduce employee exposure to hazardous chemicals.*
- *"Green" your company's public image.*

More information including a summary of aqueous cleaning units is found at [U.S. EPA](#) fact sheet "[Aqueous Parts Cleaning](#)" (see list of references).

How Much Will it Cost You to Switch to Aqueous Parts Washers?

U.S. EPA has developed a worksheet to help you calculate the cost of replacing solvent cleaning units with one or more types of aqueous units. The worksheet is attached to the fact sheet "[Aqueous Parts Cleaning - Best Environmental Practices for Fleet Maintenance](#)," November 1999. A sample calculation using the worksheet is provided.

What is the Payback Period for Switching to an Aqueous Unit?

U.S. EPA's fact sheet, "[Case Studies in Aqueous Parts Cleaning- Best Environmental Practices for Auto Repair Shops](#)," November 1999, highlights nine auto repair shops that successfully switched from solvent to aqueous-based parts washers. Payback periods range from three months to 4.7 years for switching to aqueous cleaning. There also is a vendor/supplier list at the end of the fact sheet.

Tips to help you evaluate making the switch to an aqueous based unit:

- *Remember to ask vendors/suppliers to demonstrate and let you use the aqueous unit on a trial basis before purchasing.*
- *Ask your supplier for a list of satisfied customer references.*

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Success Stories

Several companies have made the switch to aqueous parts washers. Below are a few success stories.

Microbial or Bio-remediating Units

The Texas Army National Guard purchased 10 microbial parts washers to use at various maintenance shops and equipment training sites. The parts washers have a built in heater to keep the fluid at 105° F and have a filter to trap the larger pieces of grime. The filter also needs to be replaced periodically to replenish the microbe colony. The system eliminated the need to haul away contaminated cleaner. The per unit cost was approximately \$1400. The system paid for itself after reducing purchase and disposal of as little as 100 gallons of solvent.

The Illinois National Guard purchased a microbial parts washer to clean automotive parts to remove varnish, dirt, oil and grease. They saved money by not having to dispose of a spent solvent, however, they did incur costs to dispose of the filters that had to be disposed of hazardous waste because of heavy metal concentrations.

Aqueous Spray Cabinets and Immersion Units

The Chillicothe Paper Corp. (formerly Mead Corporation, Chillicothe Operations) is an integrated pulp and paper mill. Chillicothe Paper uses many parts washers that are located throughout the plant to clean oil, grease and dirt from metal equipment during maintenance.

Chillicothe Paper replaced 36 solvent-based parts washers with 17 aqueous-based cabinet and immersion cleaning units. Since installing the aqueous units, Chillicothe Paper reduced solvent use by 3,000 gallons per year, eliminated 33,000 pounds of hazardous waste and decreased VOC emissions to the air by 34 tons per year.

Because the new washers only use soap and water, employees are not exposed to the liquid solvent or solvent vapors during the cleaning process. Chillicothe Paper had leased the old solvent parts washers for \$50,000 per year. This included the solvent, solvent disposal, and monthly servicing. By comparing the annual solvent cost of \$50,000 per year, with the purchase of the new parts washers at \$117,000, and current soap costs of \$8,000 per year, the project had a calculated payback of approximately 2.5 years. These calculations do not take into account the extra savings in labor.

The company's employees like the aqueous-based cleaning units because they are fully automatic, freeing employees to do other work. The old cleaning method was much more labor intensive because each part had to be scrubbed with a brush and solvent. Added labor savings resulted from reduced paperwork because employees no longer deal with large volumes of solvent. The aqueous cleaning units also reduced the explosion and fire hazard previously posed by the solvents.

Chillicothe Paper was a large quantity generator (LQG) for many years, but is now a small quantity generator (SQG) of hazardous waste. This change in generator status significantly reduced the company's regulatory obligations for reporting and training requirements.

Tips to Maximize and Maintain Your Aqueous Solution Life:

- *Filter the solution.* Cartridge filters can be used to remove solids as small as 50 microns.
- *Skim the oil.* Removing free-floating oil reduces the amount of oil residual left on the part and extends the life of the solution. Microbial units don't need an oil skimmer because the microbes degrade the oil.
- *Accept solution discoloration.* Don't change your solution because it "looks dirty." Many solutions turn gray or brown with use, but can still clean parts.
- *Change the solution only when cleaning performance declines.* Don't change it on a "schedule."

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- *Maintain the solution's concentration.* Use a test kit (from your vendor/supplier) to measure the solution's concentration to determine when you should add chemicals.
- *Evaluate using micro filtration.* This recycles the solution and some vendors offer this as an on-site service, eliminating waste solution generation and disposal.

Tips to Maximize and Maintain a Microbial or Bio-remediating Aqueous Unit:

- *Maintain the temperature.* Microbes require a heated environment. Don't unplug the unit, even at night.
- *Don't contaminate the solution with aerosols or other contaminant sources.* They can harm the microbes.
- *Let microbes adjust and adapt to new soils.* If the microbes don't effectively clean at first, be patient. After the microbes digest the new solids, the cleaning performance should improve.
- *Don't pour oils or "soils" into the unit.* A sudden overload of contaminants may harm the microbes. Very "dirty" or soiled parts should be pre-cleaned with a rag.
- *Monitor your unit's sludge and oil accumulation.* Solids will accumulate on the bottom, decreasing cleaning performance, and must be removed periodically (every several years). Significant oil accumulation can suffocate microbes and should be skimmed off.

If you have additional questions regarding parts washers, please contact your *district* inspector. Our hazardous waste inspectors offer technical assistance to businesses by helping them identify ways to generate less waste. If you would like to learn more about Pollution Prevention (P2) go to: www.epa.state.oh.us/ocapp/ocapp.html

References:

Aqueous Parts Cleaning -Best Environmental Practices for Fleet Maintenance, U.S. EPA Fact Sheet, 1999, 10 pp. at: www.epa.gov/region09/cross_pr/p2/autofleet/fleetclean.pdf
Aqueous Brake Washers-Best Environmental Practices for Fleet Maintenance, U.S. EPA Fact Sheet, 1999, 3 pp. at: www.dtsc.ca.gov/PollutionPrevention/VSR/vsrfactsheets/Brakewash02.pdf
Case Studies in Aqueous Parts Cleaning- Best Environmental Practices for Auto Repair Shops, November 1999, 4 pp at: www.dtsc.ca.gov/PollutionPrevention/VSR/vsrfactsheets/CasestudiesAuto02.pdf

Case Study references:

Texas Army National Guard Case study:

www.3di.com/gbof/downloads/success_stories/mat_res_waste22.pdf

Illinois National Guard Case Study: www.wmrc.uiuc.edu/main_sections/tech_assist/il_dod_env_part_case_studes.cfm#smart_washer

Chillicothe Paper: www.epa.state.oh.us/opp/p2regint/meadsep.html

Other Resources:

Training developed in 2004 for industrial parts cleaners is available on Ohio EPA's Office of Compliance Assistance and Pollution Prevention (OCAPP) Web site at: www.epa.state.oh.us/opp/partscleaningweb_files/frame.htm

OCAPP 1995 Fact Sheet: Extending the Life of Aqueous Cleaning Solutions, at: www.epa.state.oh.us/opp/solvents/fact31.html



Ask the Inspector

Q. What am I required to do before I ship my hazardous waste off-site?

A. Prior to shipping hazardous waste off-site, both small quantity generators (SQGs) and large quantity generators (LQGs) must prepare a *manifest*. Conditionally exempt small quantity generators (CESQGs) are not required to prepare a manifest. Manifests are multiple-copied tracking documents that accompany hazardous waste shipments. The manifest acts as a chain of custody for the hazardous waste from the point at which it leaves your facility until it reaches its final destination.



Each person who transports, stores, treats or disposes of waste must sign and retain a copy of the manifest. This provides a traceable link between your business and the designated facility. Once the hazardous waste reaches its final destination, the person receiving your waste returns a signed copy of the manifest to you. Be sure to provide enough copies of your manifest so that each transporter has a copy for its records. The designated facility must have two copies, one for its records and one that is to be returned to you.

If you are an SQG and do not receive a copy of the manifest signed by the designated facility within 60 days of the date your hazardous waste was accepted by the first transporter, you must send a manifest *exception report* to [Ohio EPA](#).

If you are an LQG and do not receive a copy of the signed manifest within 35 days from the date your waste was accepted by the first transporter, you must contact the transporter and/or the designated facility to determine what happened to your hazardous waste. LQGs must send a manifest exception report to Ohio EPA if a copy of the signed manifest is not received within 45 days from the date your hazardous waste was accepted by the initial transporter.

Exception reports must include a readable copy of the manifest for which you do not have confirmation of delivery. If you are an LQG, you also must send a cover letter signed by you or your representative that explains the efforts taken to locate the hazardous waste and the results of those efforts. If you are an SQG, you are not required to send a signed cover letter, but must provide some indication that you have not received confirmation of delivery from the designated facility (this can even be written on a copy of the manifest *sent to Ohio EPA*).

If you are an SQG and have a tolling agreement with recycling facilities, you do not need to manifest your hazardous waste. However, to meet this exemption, your hazardous waste must be reclaimed under a contractual agreement where the type of waste and frequency of shipments are specified in the agreement and the vehicle used to transport the waste to the recycling facility and to deliver regenerated material back to your facility is owned and operated by the waste reclaimer. Additionally, you must keep a copy of the reclamation agreement in your files for at least three years after termination or expiration of the agreement.

In addition to preparing this form for hazardous waste shipment as an SQG or LQG, you must meet the packaging, labeling, marking and placarding (pre-transportation) requirements before transporting or offering your hazardous waste for transport off-site. These hazardous waste generator *pre-transportation requirements* are found in OAC Chapter [3745-52](#).

Note: U.S. EPA has established new requirements by revising the Uniform Hazardous Waste Manifest regulations and the manifest and continuation sheet forms used to track hazardous waste from a generator's site to the site of its disposition. This new rule became effective September 6, 2005. For more information, see [Federal Register, March 4, 2005 \(Volume 70, Number 42\)](#).

Packaging

Before you ship your hazardous waste off-site, OAC rule [3745-52-30](#) requires that you package the hazardous waste as required by the U.S. Department of Transportation (DOT) regulations found in 49 Code of Federal Regulations (CFR) Parts 173, 178, and 179. Packaging for any hazardous waste must be sufficient to ensure containment of the material throughout the entire transportation cycle.

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Labeling

Before you ship your hazardous waste off-site, OAC rule [3745-52-31](#) requires you to label each package of hazardous waste as required by DOT regulations found under [49 CFR Part 172](#). All packages of hazardous waste must be labeled with the primary hazard label. Primary hazard labels are used as identifiers on containers being used to ship hazardous waste. They are smaller versions of placards with the same or similar designs.

Marking

Before you ship your hazardous waste off-site, OAC rule [3745-52-32](#) requires you to mark each package of hazardous waste as required by DOT regulations found in [49 CFR Part 172](#). DOT requires that each package/container of hazardous waste be marked with the waste's proper shipping name and identification number.

Before you transport hazardous waste off-site, you must mark each container of 110 gallons or less with the following information displayed as required by [49 CFR 172.304](#):

"Hazardous waste-Federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, or the United States Environmental Protection Agency.
Generator's name and address _____ Manifest document number _____."

Placarding

Before you transport hazardous waste off-site, you must placard the transport vehicle or offer the initial transporter the appropriate placards according to DOT regulations found in [49 CFR Part 172](#). When required, hazardous wastes that are transported by highway or rail must be placarded with the Primary Hazard Class Placard and the Subsidiary Hazard Class Placard if required. Placards must be placed on all four sides of motor vehicles and rail cars containing hazardous waste.

For more information on your [generator requirements](#), see Chapter 3 of Ohio EPA's [Generator Handbook](#).



How Must I Manage the Waste from My Aqueous Parts Washer?

The use of an aqueous parts washer could save you money, as well as time. It also may result in limiting employee exposure to harmful chemicals. Aqueous parts washers sometimes use cleaning agents which rely more on physical mechanisms such as agitation and heating, to get parts clean. There will be environmental advantages when you are able to use less toxic cleaning agents.

Although some water-based parts washers may not contain solvents, each waste stream must be carefully evaluated to determine if it is classified as a hazardous waste. Waste evaluation requirements pertain to every waste stream generated by your business, including waste generated from aqueous parts washers. When evaluating waste from your parts washer, you must consider the cleaning agent used as well as the material being cleaned from the part.

[Ohio Administrative Code](#) (OAC) rule [3745-52-11](#) requires that you properly evaluate your waste to determine if it is hazardous waste. Clarification of how waste evaluation requirements may affect your business can be found in:

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DHWM's guidance documents and *Notifier* articles including:

- "I don't Generate Very Much Waste, Do I Need to Evaluate it?";
- *Letter to generators* about waste evaluation; and
- *Generator Handbook*;

The *Office of Compliance Assistance and Pollution Prevention* guidance documents including:

- *Identifying Your Hazardous Waste*; and
- *Managing Your Hazardous Waste: A Guide for Small Businesses*;
- Ohio's *hazardous waste rules*; or

By Contacting:

- Your *Ohio EPA District Office* Inspector;
- DHWM's *Regulatory Services Unit*; or
- The Office of Compliance Assistance and Pollution Prevention.

Waste streams generated from using any parts cleaner may include sludges, filters, spent cleaning solutions, and skimmed oil and grease. Skimmed oil and grease may be regulated by the used oil standards found at OAC chapter [3745-279](#) and may be taken off-site by a used oil recycler.

Under the generator treatment requirements you can use evaporators to reduce the volume of your hazardous waste. If there is a release of hazardous waste or hazardous waste constituents to the air or to the environment, it is considered disposal. A generator is not allowed to dispose of hazardous waste on-site without a permit. This limits the use of evaporators for hazardous waste treatment to aqueous waste that does not contain volatile hazardous constituents (VHCs) unless the VHCs are first removed by filtration or some other manner. Additional guidance is available on the use of evaporators in [Generator Treatment Guidance](#).

As mentioned, when you are evaluating your waste, be sure to consider the spent cleaning agent as well as the material you are cleaning from the part.

Because each process is unique, it's not possible to predict how waste from any particular business or process must be managed. The generator must evaluate each waste to determine how it must be managed.



My disposal company says my waste is exempt or excluded from the hazardous waste rules, what is my responsibility?

Under Ohio Administrative Code Rules [3745-51-02](#), [3745-51-04](#) or [3745-51-06](#), some hazardous wastes are excluded or exempt from regulation as hazardous waste. These rules are self - implementing. If you claim that your hazardous waste is excluded or exempt, you are responsible for maintaining information that demonstrates your waste meets the terms of the exclusion or exemption.

In some instances, the company you are sending your waste to may have asked us for a regulatory interpretation pertaining to the wastes they accept. This means they want to know if we agree that a certain type of waste being used in a specific way is excluded under the rules. When we receive these questions, we often ask the company to provide us with information that indicates that they have specifications for the types of materials they can use in their process. They may give us documents from specific waste streams to assist us in our determination. If the process the company describes meets the requirements in the rules for the exclusion or exemption, we will send them a letter confirming their interpretation of the rule. This process can also be executed in other states by their environmental agency.

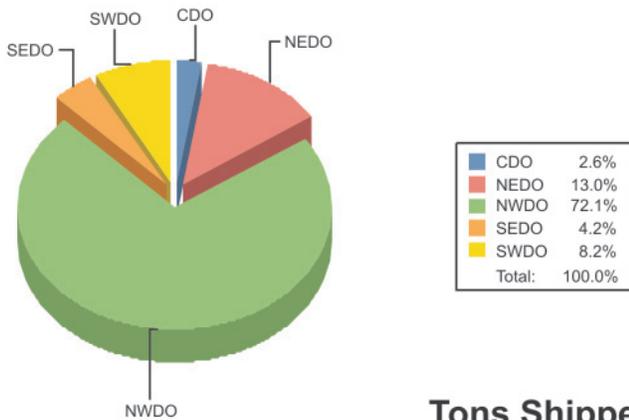
When a company approaches you about handling your hazardous waste as an excluded or exempt waste, you should ask them to provide you with an explanation of the rule that excludes it and any letters they have received from us or another state environmental agency so you can decide whether your waste meets the exclusion. If they do not have such a letter, you should consider contacting the [Regulatory Services Unit](#) at (614) 644-2917 to confirm that your waste would be excluded or exempt.

You also should be aware that all states do not have the same rules or interpretation of those rules. That means while your waste may be exempt or excluded in the state you are sending it to, it may still be regulated in Ohio.

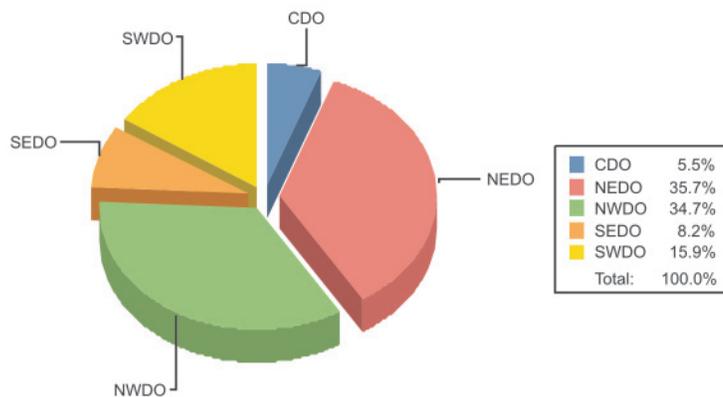
Annual Report Data

The two pie charts below are compiled from information reported to Ohio EPA by facilities who filed 2003 Annual Hazardous Waste Reports. The trend chart represents data from 1996-2003 Reports. Annual Reports must be filed by Large Quantity Generators and facilities with a Treatment, Storage, or Disposal permit. In 2003, the total amount of hazardous waste generated was 1,802,751 tons and the total shipped was 649,439 tons. To obtain more statistical information about Ohio's generation and management of hazardous waste, contact Paula Canter of DHWM's Information Services Unit at paula.canter@epa.state.oh.us

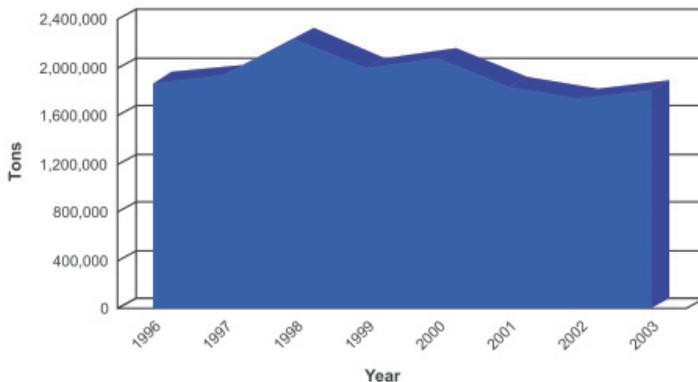
Tons Generated in each District Office



Tons Shipped in each District Office



Historical Hazardous Waste Generation from 1996 to 2003



Lamps

Across

3. Universal waste handlers include persons who _____, receive and store, but do not treat, dispose of or recycle universal waste generated elsewhere.

5. The universal waste rule prohibits handlers from _____ lamps.

9. Universal waste handlers are not required to _____ their off-site shipments.

10. A waste must be a _____ waste before it is defined as a universal waste.

11. Because most lamps exhibit the characteristic of _____ for heavy metals when disposed, they could be a hazardous waste.

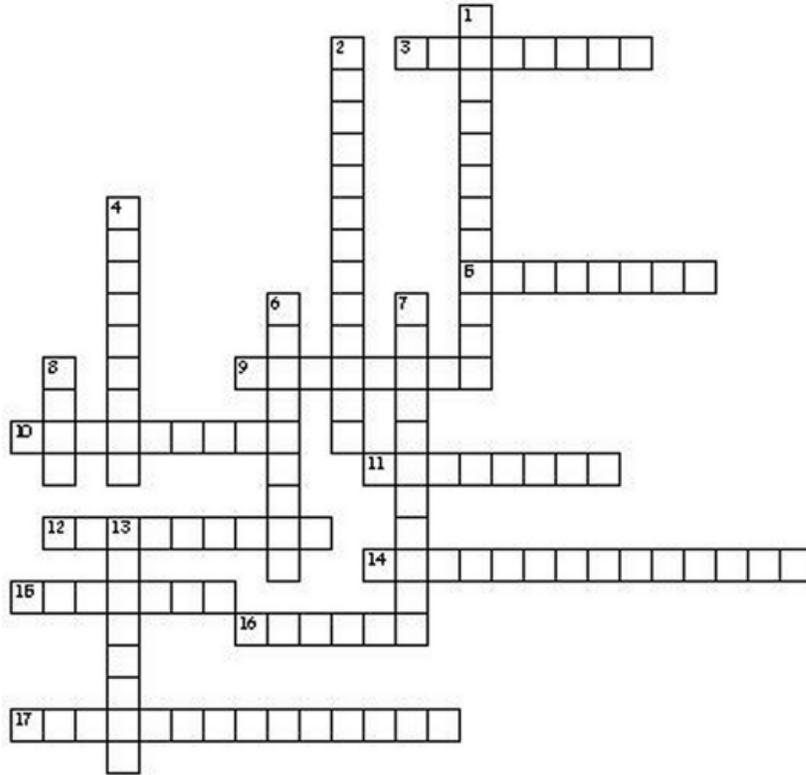
12. Some examples of acceptable packaging for fluorescent lamps include double- or triple-ply _____ containers with closed lids or packaging in which new lamps are shipped from the manufacturer.

14. The fluorescent lamp containers should never be labeled " _____ " unless being managed as such. (two words)

15. Fluorescent lamps may contain up to 40 mg of elemental _____, depending on the brand and manufacturer date.

16. Non-hazardous lamps still contain low amounts of heavy _____, such as mercury, that could potentially harm the environment.

17. For information about mercury containment and clean-up, contact your local _____ or call Ohio EPA's spill hotline at 1-800-282-9378. (two words)



Down

1. The term "lamp" applies generically to hazardous waste lamps including: _____, fluorescent, metal halide, neon, high-intensity discharge, high-pressure sodium and mercury-vapor lamps.

2. _____ universal waste handlers must notify Ohio EPA in writing and must obtain an EPA hazardous waste ID number prior to exceeding the 5,000 kg storage limit. (two words)

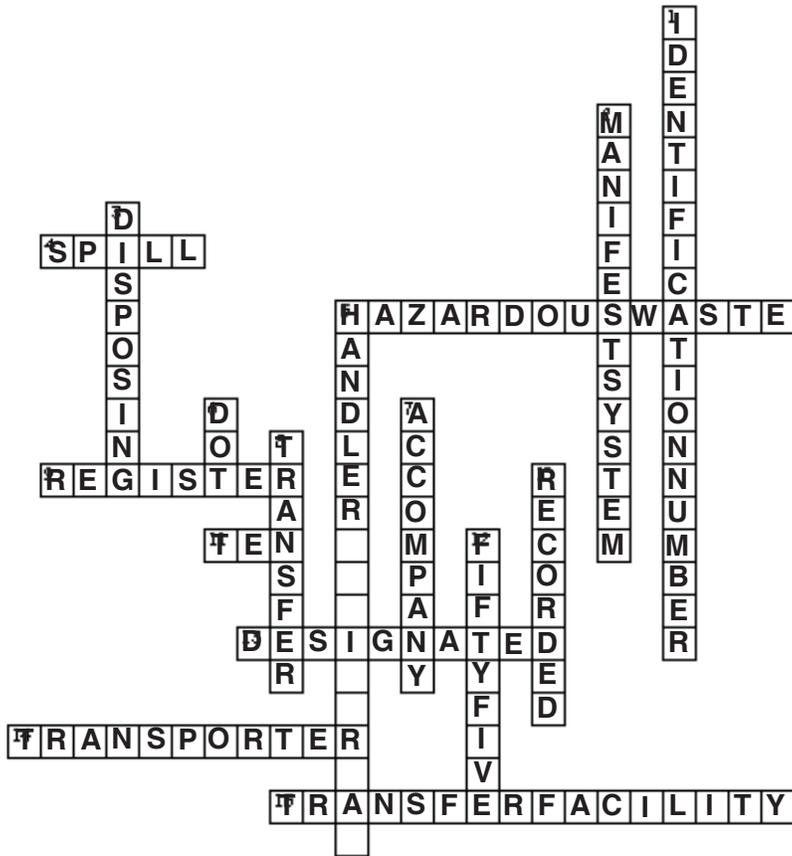
4. Non-hazardous lamps also can be managed as _____ wastes, though the universal waste compliance standards are not required.

6. Both small and large quantity universal waste handlers can _____ their universal waste lamps to either another universal waste handler or to a universal waste destination facility if they comply with the universal waste transporter requirements.

7. The list of universal waste includes certain suspended and recalled pesticides, mercury-containing _____, discarded batteries and now, fluorescent lamps.

8. If you are a universal waste handler, you may accumulate universal waste fluorescent lamps on-site for up to one _____ regardless of your status.

13. Hazardous lamps are now considered to be "spent materials" and remain hazardous waste even when _____, unless they are managed as universal wastes.



We apologize for the error in the answer key for 5 down.

Ohio Hazardous Waste

Notifier

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