

Electric lamps include fluorescent, high intensity discharge (HID), sodium vapor, mercury vapor, neon, metal halide, and incandescent lamps and cathode ray tubes (CRTs) from computers, televisions, etc. All generators of waste, except households, are responsible for determining if their waste lamps are hazardous under current state and federal regulations. This determination can be done by knowledge of the waste or by testing the waste. A number of electric lamps in common use contain mercury and lead as an essential component of their operation. Check the Material Safety Data Sheet (MSDS) or other manufacturer literature for information about your lamps' hazardous characteristics. Several manufacturers now market low-mercury and low-to-no-lead lamps and provide documentation that these lamps are not considered a hazardous waste.

The U.S. EPA adopted the Toxicity Characteristic Leaching Procedure (TCLP) in September of 1989 as the test to determine if a waste is toxic hazardous waste. Test results on lamps using the TCLP test are variable. Information from the Wisconsin Department of Natural Resources and the Minnesota Pollution Control Agency indicates that fluorescent lamps, sodium-vapor lamps, high- and low-pressure mercury vapor lamps, and HID lamps contain mercury in concentrations that exceed TCLP limits. Incandescent light bulbs and color CRTs from computers and televisions may contain lead in soldered bases and glass at levels that exceed the hazardous waste limit. Other tests occasionally indicated incandescent bulbs also had cadmium levels at hazardous waste levels. Black and white CRTs sometimes exceeded the lead limit. Mercury tests on lamps conducted by the National Electrical Manufacturers Association, however, indicate that the results are variable with some below the hazardous waste concentration. Regulated hazardous wastes have specific waste numbers. In Michigan, wastes containing mercury at concentrations of 0.2mg/L or more would be a D009 hazardous waste. Waste containing lead at concentrations of 5.0 mg/L or more would be a D008 hazardous waste. Waste containing cadmium at concentrations of 1.0 mg/L or more would be a D006 hazardous waste.

Waste found to have hazardous toxicity characteristics is subject to the hazardous waste management regulations [Part 111 of Michigan's Natural Resources and Environmental Protection Act, 1994 P.A. 451, as amended (P.A. 451) and Subtitle C of the federal Resource Conservation and Recovery Act (RCRA) of 1976, as amended, and any administrative rules or regulations promulgated pursuant to these acts]. The specific management requirements will depend on the company's hazardous waste generator status — large quantity (LQG), small quantity (SQG), or conditionally exempt small quantity generator (CESQG). An alternative to managing the used lamps as a hazardous waste is to manage them as a universal waste in compliance with R 299.9228 of the Part 111 Rules and 40 CFR Part 273. See the *Universal Waste* fact sheet for more information.

One of the reasons for the universal waste rule was to make it easier to recycle lamps. It is recommended that all electric lamps be recycled, including low mercury and lead lamps. In addition to recovering the mercury, recyclers may also recover the metal end caps, the phosphor powder, and the glass. See the attached list for companies offering recycling services.

**Hazardous Waste Generator Status Categories**

In ONE month, the total amount of ALL NONACUTE hazardous waste is generated at the following volumes:  
**LQG:** 1,000 kg (2,200 pounds) or more [and/or 1.0 kg (2.2 pounds) or more of acutely and severely toxic hazardous waste is generated.]

**SQG:** 100 kg (220 pounds) to less than 1,000 kg (2,200 pounds). Accumulation amount never meets or exceeds 6,000 kg (13,200 pounds).

**CESQG:** less than 100 kg (220 pounds). Accumulation amount never meets or exceeds 1,000 kg (2,200 pounds).

There are also storage time limits. Contact the DEQ Environmental Assistance Division at 800-662-9278 or your local DEQ Waste Management Division district office. Or download hazardous waste fact sheets from the Internet at [www.deq.state.mi.us/ead/pub](http://www.deq.state.mi.us/ead/pub) for more information.

*Caution: If you are considering relamping your facility, consider if the volume of lamp waste will change your generator status. If you handle them as a universal waste, it will not affect your status.*

Basically there are two recycling options available. One involves shipping the spent lamps to the recycler. If you are a Small Quantity Generator or Large Quantity Generator and are managing the spent lamps as a hazardous waste, you will need to hire a permitted and registered hazardous waste transporter and meet all the hazardous waste transportation requirements. If you are managing electric lamps as universal waste, you are not required to use a permitted and registered transporter or a manifest unless the lamps are being sent to or through other states that do not regulate them as universal waste. However, you still need to meet any applicable U.S. Department of Transportation (US DOT) hazardous materials requirements such as placarding, shipping papers, containers, etc. Hazardous materials include having one pound or more of mercury in one container. The number of bulbs to reach this mercury limit will vary depending on your brand of lamps and length of bulbs. Four-foot fluorescent lamps may contain between 15 and 50 milligrams of mercury per tube. More US DOT information can be found on the Internet at [hazmat.dot.gov](http://hazmat.dot.gov) or by calling the US DOT at 800-467-4922.

The second option involves the recycling company coming to your facility. Under this situation, the generator needs to manage the lamps either as a universal waste or hazardous waste while they are on-site. Once the recycler processes the lamps, they are responsible for any further hazardous waste management requirements, provided the recycler takes all residues when they leave the facility. If any residues, including crushing filters, are left at the facility, the generating facility is responsible for managing them properly.

**Waste lamps should be placed in the cardboard sleeve or box in which the replacement tubes or bulbs arrived, or any other appropriate container such as double- or triple-ply cardboard containers, and placed where they cannot be broken until they are shipped off-site or recycled on-site.** The containers must be kept closed and be structurally sound and adequate to prevent breakage. Some lamp recyclers provide containers. Most lamp recyclers only want to handle unbroken or uncrushed lamps. Once the lamps are crushed, they can no longer be managed as universal waste and must be managed as hazardous waste.

If you are considering crushing or recycling your own generated lamps on-site, discuss the requirements with your Department of Environmental Quality, Waste Management Division and Air Quality Division District Office staff. You may be required to obtain an air permit. A permit is not required from the Waste Management Division if the lamps are being recycled, but there are other regulations that must be met. These include proper container management and inspections, use of secondary containment, and emergency preparedness and prevention requirements. Any wastes generated from the crushing or recycling process, including the crusher filters, must be

characterized to determine if they are hazardous waste. There are additional lamp recycling requirements if you handle other companies' lamps.

Wastes found to be nonhazardous are subject to the state solid waste disposal regulations (Part 115 of P.A. 451). Electric lamps that are not considered hazardous waste and lamps generated by conditionally exempt small quantity generators may be disposed of in licensed landfills if approved by the landfill authority. However, there may be future liability concerns if the landfill becomes contaminated.

**TIP:** For safety's sake, be cautious if you have metal halide lamps. Some may "fail violently" at the end of their useful life. If it is a deep blue color, there is an increased risk of it failing. It is recommended that metal halides be shut off at least once a week, which usually allows them to fail at start-up rather than exploding or shattering. Direct questions to your lighting supply company.

### Capacitors and Ballasts

If you have waste capacitors and ballasts, determine if they contain polychlorinated biphenyls (PCBs) which are regulated under the federal Toxic Substances Control Act (TSCA). PCB articles regulated under TSCA include those items containing PCB concentrations of 50 ppm or greater and any leaking devices. Disposal of ballasts and capacitors containing less than 3 pounds of PCB fluid is generally not subject to the TSCA disposal requirements unless they are leaking. Prior to 1978, most ballasts were made with small capacitors containing PCB-insulating liquid. If you have ballasts manufactured before 1978 or your ballasts do not contain the statement "No PCBs," you should assume they contain PCBs unless you have:

- ✓ Documentation from the manufacturer that states they do not contain PCBs, or
- ✓ Chemical analysis that indicates they do not contain regulated levels of PCBs.

If the device is regulated under TSCA, then it is exempt from the hazardous waste regulations. If it is not regulated under TSCA, then it is necessary to determine if it would be a regulated hazardous waste and managed accordingly. PCBs themselves are not classified as hazardous waste, but the device may have lead, cadmium, chromium, or other D004 through D017 constituents at regulated concentrations.

EPA recommends recycling the devices. Nonhazardous waste and none-TSCA regulated devices may be disposed of in an approved landfill or chemical disposal facility. Check with the landfill if they will accept the devices. Pack the devices in a US DOT-approved drum with adequate absorbent such as sawdust or soil to absorb any liquid in the device, and label the container. If the devices contain liquids and are not regulated PCB articles, or are a liquid hazardous waste generated by a CESQG, either hire a

permitted liquid industrial waste transporter, or transport the devices in your own vehicle, and have them taken to an approved disposal site. Complete the DEQ waste manifest for each shipment hauled by a transporter and shipments greater than 55 gallons hauled by the generator. Use the waste code 026L for PCB-containing devices, or use the 029L waste code for other ballasts or capacitors containing non-PCB liquids on the manifest.

Generators may haul their own liquid waste in quantities of 55 gallons or less without a manifest if the following conditions are met:

- ✓ A record of the source and quantity of the waste and where the waste is being taken must accompany the shipment.

- ✓ The generator must obtain a signature from the facility accepting the waste and provide them a copy of the record and keep the record for at least 3 years.
- ✓ The disposal facility is managed according to the liquid industrial waste regulations.

If the devices are hazardous waste generated by a SQG or LQG, hire a permitted hazardous waste transporter and use the applicable waste codes on the manifest.

See the EPA Internet site at [www.epa.gov/pcb](http://www.epa.gov/pcb) for more information about PCB requirements including a list of disposal and storage facilities. Or call EPA Region V at 312-886-6878. Also see the DEQ fact sheet "PCBs in Fluorescent Light Fixtures" for information about handling leaking devices. It can be found on the Internet at [www.deq.state.mi.us/wmd](http://www.deq.state.mi.us/wmd) or call 800-662-9278 for a copy.

### ELECTRIC LAMP RECYCLING SERVICES

The following is a list of companies known to accept electric lamps at the time of this publication's printing. Many of the listed companies offer recycling services for other materials besides electric lamps such as other mercury-containing devices, ballasts, computers, and electronic equipment. Additional information can best be found by contacting the company directly. Or look in the DEQ *Recycled Materials Market Directory* which is available on the Internet at [www.deq.state.mi.us/ead/recycle](http://www.deq.state.mi.us/ead/recycle) or request a printed copy by calling 800-662-9278.

#### MICHIGAN COMPANIES

Battery Solutions Inc 38680 Michigan Ave Wayne MI 48184 734.467.9110 Email: <a href="mailto:csova@batteryrecycling.com">csova@batteryrecycling.com</a> <a href="http://www.batteryrecycling.com">www.batteryrecycling.com</a>	Enviro-Tech Compliance Services Inc. 27777 Franklin Rd Ste 108 Southfield MI 48034 800.229.3230 or 248.354.1772	Safety-Kleen Corp 2700 Mullins Court NW Grand Rapids MI 49504 616.453.7922 <a href="http://www.safety-kleen.com">www.safety-kleen.com</a>
CleanLites Recycling Inc 665 Hull Rd PO Box 212 Mason MI 48854 888.676.0044 or 517.676.0044 Email: <a href="mailto:clr_m@tir.com">clr_m@tir.com</a>	Full Circle Recyclers 1223 Clopton Bridge Rochester Hills MI 48306 248.651.6589 Email: <a href="mailto:waxell@evtc.com">waxell@evtc.com</a> <a href="http://www.evtc.com">www.evtc.com</a>	Safety-Kleen Corp 3899 Wolf Rd Saginaw MI 48601 517.753.3261 <a href="http://www.safety-kleen.com">www.safety-kleen.com</a>
Detrex Corp/Solvents & Environmental Services Division 12886 Eaton Ave Detroit MI 48227 313.491.4550 <a href="http://www.detrex.com">www.detrex.com</a>	Innovative Recycling and Waste Services 3013 Woodbury Blvd Walled Lake MI 48390 800.440.1641 or 248.960.5203 Email: <a href="mailto:irws@ix.netcom.com">irws@ix.netcom.com</a>	SQS Inc 7522 Baron Dr Canton MI 48187 734.459.3800
Detrex Corp/Solvents & Environmental Services Division 950 28 <sup>th</sup> St SE #A105 Grand Rapids MI 49508-1300 616.454.9269 <a href="http://www.detrex.com">www.detrex.com</a>	Metro Recycling Systems 7410 ME Cad Blvd # D Clarkston MI 48348 800.527.0057	Unlimited Recycling Inc 30370 School Section Rd Richmond MI 48062 810.784.4980 Email: <a href="mailto:chilo@home.msen.com">chilo@home.msen.com</a>
Drug and Laboratory Disposal Inc. 331 Broad St Plainwell, MI 49080 616.685.9824 Email: <a href="mailto:kevin@dld-inc.com">kevin@dld-inc.com</a> <a href="mailto:Brent@dld-inc.com">Brent@dld-inc.com</a>	Perennial/Global Recycling Technologies, Inc 29209 Northwestern Hwy PMB #518 Southfield MI 48034 248.358.5211 Email: <a href="mailto:jgriffpsi@aol.com">jgriffpsi@aol.com</a>	Valley City Environmental Services Inc 1040 Market SW Grand Rapids MI 49503 616-235-1500 Email: <a href="mailto:bvanstright@valleycityES.com">bvanstright@valleycityES.com</a>
Enviro Inc PO Box 1325 Birmingham MI 48012 800.237.5127 or 248.642.0220	Safety-Kleen Corp 700 Zimmerman Rd Mason MI 48854 517.676.6221 <a href="http://www.safety-kleen.com">www.safety-kleen.com</a>	

## OUT-OF-STATE COMPANIES

Heritage Environmental Services 7901 W Morris St Indianapolis IN 46231 800.827.0476 or 317.243.0811	Mercury Technologies of MN, Inc 1360 Holstein Dr Pine City MN 55063 800.864.3821 Email: mercotech@ecenet.com	Century Environmental Services 8488 W Hillsborough Ave #134 Tampa FL 33615 888.446.2144 or 813.814.9755
Lighting Resources Inc 498 Park 800 Dr Greenwood IN 46143 317.888.3889	Recyclights 401 West 86 <sup>th</sup> St Minneapolis MN 55420 800.831.2852 Email: enviro@recyclights.com www.recyclights.com	EnviroLight Inc 1967 West 9 <sup>th</sup> St Riviera Beach FL 33404 561.840.9111
Safety-Kleen Corp. 2217 Western Ave South Bend IN 46619 219.289.4510 Email: rpatzschke@safety-kleen.com www.safety-kleen.com	Eastern Environmental Technologies Inc 47 Purdy Ave Port Chester NY 10573 800.808.7227 Email: eet@erols.com www.easternenvironmental.com	P-3 Incorporated 2611 Sammonds Rd Plant City FL 33567 800.777.4635 or 813.707.8887 Email: onesource@P-3.com www.P-3.com
Environmental Recycling 527 E Woodland Circle Bowling Green OH 43402 800.284.9107 or 419.354.6110 Email: envrecycle@aol.com www.environmentalrecycling.net	Full Circle, Inc 509 Manida St Bronx NY 10474 718.328.4667 Email: fulcircle@evtc.com www.evtc.com	CleanLites Recycling 4455 S Pine St Spartanburg SC 29302 877.597.0044
Recyclights 4220 Perimeter Dr Columbus OH 43228 888.831.2851 or 614.276.3000 enviro@recyclights.com www.recyclights.com	Bethlehem Apparatus Co 890 Front St PO Box Y Hellertown PA 18055 610.838.7034 Email: bacohg@aol.com www.thomasregister.com/bethapp	Earth Protection Services, Inc 10 South 48 <sup>th</sup> Ave Ste 4 PO Box 23820 Phoenix AZ 85063-3820 800.588.7190 Email: earthpro@cyberhighway.net www.earthpro.com
Lamp Recyclers Inc PO Box 12027 Green Bay WI 54307-2027 800.558.1166	Mercury Recovery Services 700 Fifth Ave New Brighton PA 15066 724.843.5000 Email: info@mrs-inc.com www.mrs-inc.com	Salesco Systems USA Inc 5736 W Jefferson Phoenix AZ 85043 800.368.9095 or 773.836.1356 www.ssusa.com
Scientific Recycling 659 Commerce St Holmen WI 54636 800.917.1969 or 608.526.9777	Advanced Environmental Recycling Co Mercury Technologies International (MTI) 2591 Mitchell Ave Allentown PA 18103 800.554.2372 or 610.797.7608	Allied Technology Group 47375 Fremont Blvd Fremont CA 94538 510.490.3008 Email: reneefwatg@aol.com
Superior Special Services PO Box 1323 Fon Du Lac WI 54936-1323 800.556.5267 Email: amypaikowski@netscape.net www.superspecial.com	Global Recycling Technologies Inc 218 Canton St Stoughton MA 02072-2219 800.478.6055 or 781.341.6080 Email: bjenkins@grtonline.com www.grtonline.com	Waste Management Emelle Facility PO Box 55 Hwy 17 N Milemarker 163 Emelle AL 35459 800.652.5755
WRR Environmental Services Company 5200 State Rd 93 Eau Claire WI 54701 715.834.9624 Email: wrrstaff@wrres.com www.wrres.com	NSSI Box 34042 Houston TX 77234 713.641.0391 Email: nssi@nssihouston.com www.nssihouston.com	

The above list of recycling collectors, brokers, and processors was put together by the DEQ Environmental Assistance Division to provide information about potential markets for recyclable materials. The information is subject to change. The DEQ does not recommend or endorse the services or products of any particular company listed. The quality of service is not known or implied by this listing. Inclusion or omission from this list does not represent that a company is, or is not, in compliance with applicable state and federal environmental regulations. Other companies that are not listed may offer the services you need. As a generator of waste, you are ultimately responsible for its disposition. Use good judgement when contracting with any entity listed.

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