

## How DEQ Regulates Electronics Waste

This fact sheet summarizes DEQ's guidance for electronic waste, known as e-waste, handling facilities.

### What is E-waste?

E-waste includes electronic devices that are used at home and work that may contain toxic or hazardous substances such as lead or mercury that the owner has discarded or intends to discard. These devices include televisions, computer monitors, computers, printers, facsimile machines, copying equipment, calculators, VCRs, cell phones, telephones, radios, DVD players, portable DVD players with video screens, and any other or future types of equipment that are designed primarily to store or convey information electronically, and any new accessories to such equipment.

### Why recycle e-waste?

E-waste contains recoverable materials that can be re-used or transformed into new products. Re-using these materials promotes sustainability by reducing use of virgin materials needed to make electronic equipment. By recovering metals and plastics from computers and printers, manufacturers reduce the amount of metals and petroleum products extracted from the earth to make new electronic equipment. Recovery and re-use of these materials reduces greenhouse gases. If done properly, recovery can help prevent water and air pollution from mining activities and reduce energy consumption.

### What are the hazards?

Improperly collecting, sorting, processing, and storing e-waste can put people and the environment at risk. Most e-waste contains materials toxic to humans, plants and animals. Depending on the type, amount and exposure time, some of these toxic materials can cause cancer in humans, and create significant water and air pollution.

- **Mercury** is linked to brain and kidney damage, and impacts fetal development. **Flat panel displays** usually contain mercury.
- **Lead** inhibits mental development of babies and children and is toxic to the kidneys, nervous and reproductive systems. **Cathode Ray Tube, also known as CRT, and CRT monitors**

**and televisions, and solder on circuit boards usually contain lead.**

- **Cadmium** is linked to kidney damage, and harms fragile bones. **Chips on circuit boards, infrared detectors, semiconductors and older CRTs usually contain cadmium.**



*CRT televisions stored inside a building and on pallets at an e-waste collection facility.*

- **Barium** can cause brain swelling, muscle weakness and damage to the heart, liver, and spleen. **Front panels of CRTs usually contain barium to protect users from radiation.**
- **Plastics**, when burned, can create dioxin, a known carcinogen. **Circuit boards, covers, and cables usually contain plastics.**
- **Brominated flame retardants** used in **plastic housings** in electronic equipment are a likely cause of reproductive problems and can potentially harm a developing fetus. Some countries and states have banned brominated flame retardants.

### How does DEQ regulate e-waste?

DEQ requires all facilities that handle e-waste to know and understand any hazardous waste requirements that apply to them. These e-waste facilities include those that collect and store; take apart by disassembling, dismantling or remanufacturing; shred, grind or otherwise intentionally break apart; or transform by melting or smelting any e-waste. Any e-waste taken apart, broken up, ground up or otherwise modified may become hazardous waste if not recycled.



State of Oregon  
Department of  
Environmental  
Quality

Land Quality Division  
Solid Waste Program  
and Hazardous Waste  
Program

811 SW 6<sup>th</sup> Avenue  
Portland, OR 97204  
Phone: (503) 229-5696  
(800) 452-4011  
Fax: (503) 229-6762

[www.oregon.gov/DEQ](http://www.oregon.gov/DEQ)

*DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.*

**If a facility accidentally breaks CRTs**, the facility must complete a hazardous waste determination to determine if the broken CRTs have become hazardous waste. **If a facility grinds, shreds or breaks apart CRTs, computers, circuit boards or other e-waste** and the residual is not recycled, the facility must complete a hazardous waste determination to learn if the residual is hazardous waste.

A facility that handles e-waste may be a regulated small quantity or large quantity generator of hazardous waste and need to dispose of e-waste that designates as hazardous waste at a landfill permitted to accept hazardous waste.

DEQ will determine if a facility that collects, stores and handles e-waste needs a solid waste permit based on each type of facility.

### **How should facilities collect and store e-waste?**

E-waste facilities should collect and store e-waste so the waste does not come in contact with rain water, storm water or flood waters and is not exposed to extreme temperatures or wind. Facilities must store whole units indoors on pallets or in boxes to prevent accidental breakage. If a facility that collects e-waste already has a solid waste permit, DEQ will amend the permit to address e-waste handling. If the collector does not have a solid waste permit, DEQ will not require one unless a complaint response or site visit uncovers environmental concerns that are not addressed. DEQ may require a transfer station or material recovery facility permit if the facility does not address environmental concerns.

### **Dismantling, disassembling and/or remanufacturing**

Many hazards in e-waste are harmless to people as long as devices are left intact. Facilities that process e-waste by taking apart devices increase health risks to staff and customers and increase the potential for environmental contamination. A facility that DEQ determines presents an environmental risk must get a DEQ solid waste material recovery facility permit.

Facility operators need to provide appropriate protective equipment to staff and avoid exposing e-waste to the environment. Facility operators must account for all of the disassembled component pieces.

E-waste components should not be exposed to rain, wind or other conditions. Such exposure could spread potentially harmful dust into the environment. Facilities must put in place contingency plans for handling inadvertently

broken CRTs, even if they do not plan to break, shred, or grind CRTs on site.

DEQ will evaluate all e-waste dismantling, disassembling, and remanufacturing facilities to determine if a solid waste permit is needed.

### **Breaking, shredding, or grinding CRTs or other e-waste**

A facility that breaks, shreds, or grinds CRTs or other e-waste must have a DEQ solid waste material recovery facility permit.

These facilities are potentially exposing staff, customers, and the environment to hazards in a form that could be easily ingested, inhaled, and transported into the environment. The DEQ Air Quality Program must assess all shredding or grinding equipment to determine whether an air quality permit is required. Machines must have adequate controls to prevent dangerous emissions to the environment and exposure to staff.

### **Transforming e-waste**

DEQ may require a solid waste permit for a facility that transforms e-waste into other products through smelting, refining or other processes that could potentially discharge significant pollution into the air and water.

### **What happens to e-waste once it leaves a facility?**

When e-waste is sent for additional processing to another country, environmental impacts may be more harmful than the collection, storage, handling and processing done in Oregon or the United States.

Media stories have highlighted the risks of e-waste from the United States that is illegally dumped, burned, or processed in a manner that adversely affects workers, including children, in other countries.

DEQ recommends that a company find out where the materials go once shipped from their facility. A company is ultimately responsible for materials from its facilities that are not managed properly and become hazardous waste.

Companies must know about all overseas companies with which they contract, visit them, and ask questions about their permits and status with the EPA.

A company that ships materials overseas, should inquire with the local authorities as to whether or not the facility complies with applicable worker safety and environmental laws.



**Where can companies get help and/or more information?**

DEQ E-waste Recycling Web Page:  
[www.deq.state.or.us/lq/electronics.htm](http://www.deq.state.or.us/lq/electronics.htm)

**DEQ Technical Assistance**

- Northwest Region  
Audrey O'Brien  
503-229-5072
- Western Region  
Brian Fuller  
541-687-7327
- Eastern Region  
Lissa Druback  
541-298-7255 ext. 222

**Oregon Hazardous Waste Program**

For information on management of hazardous waste,  
[www.deq.state.or.us/lq/hw/hwmanagement.htm](http://www.deq.state.or.us/lq/hw/hwmanagement.htm)

**Oregon E-cycles Program**

For information about participating in the DEQ electronics recycling program, call 503-229-5830 or visit [www.oregoncycles.org](http://www.oregoncycles.org)

**Oregon OSHA**

For information about worker safety, personal protective equipment or to request a consultation, call 503-378-3272 or 800-922-2689.

**EPA Region 10**

For more information on federal regulations including e-waste exports call 800-424-4EPA.

**Metro**

For more information about recycling or to be listed as a recycler in the Portland region call 503-234-3000 or visit [www.oregonmetro.gov/index.cfm/go/by.web/id=525](http://www.oregonmetro.gov/index.cfm/go/by.web/id=525).

**Alternative formats**

Alternative formats (Braille, large type) of this document can be made available. Contact DEQ's Office of Communications & Outreach, Portland, at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696. People with hearing impairments may call 711.