

**OREGON E-CYCLES
ENVIRONMENTAL MANAGEMENT PRACTICES**



State of Oregon
Department of
Environmental
Quality

Oregon’s Electronics Recycling Law enacted in 2007 (House Bill 2626) creates and finances a statewide collection, transportation, and recycling system for desktop computers, portable computers, monitors, and televisions (covered electronic devices or CEDs). Manufacturers of CEDs sold or offered for sale in Oregon must either manage their own collection and recycling programs under a plan approved by DEQ or participate in the State contractor program established under this new law. These programs must use environmentally sound management practices for the collection, transportation, and recycling of CEDs.

“Environmentally sound management practices” are defined as:

[P]ractices that comply with all applicable laws, including but not limited to adequate record keeping, tracking the fate of recycled materials, performance audits and inspections, provisions for reuse and refurbishment, compliance with worker health and safety requirements, maintaining liability insurance and financial assurances.

This document describes environmentally sound management practices for collection, transportation, and recycling services provided under the State contractor program. These practices will also serve as guidance to DEQ staff evaluating the plans and services of manufacturer-run programs. Manufacturers’ Environmental Management Practices that substantially incorporate these elements will be presumptively approvable by DEQ.

Oregon E-Cycles Environmental Management Practices

The table below lists responsible management strategies (Section 1) and specific practices for the collection (Section 2), transportation (Section 3), and recycling (Section 4) of electronic waste.

	PRACTICE	APPLICABLE ACTIVITY
	SECTION 1: RESPONSIBLE MANAGEMENT STRATEGIES	
	a) Consider and incorporate where practical the hierarchy of solid waste management for CEDs and CED components. <ol style="list-style-type: none"> 1) Reuse and refurbish – Screen for whole units at the point of collection. 2) Recycle – <ol style="list-style-type: none"> I. As appropriate, dismantle, and/or mechanically process, and separate CEDs, CED components, and materials into separate streams based on principles of effective (value generating and waste minimizing) for safe recovery of materials. II. Send separated materials for recovery of raw materials at facilities that use technologies and processes that have been determined to be protective of health, safety, and the environment. 	

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	<p>3) Energy Recovery and Disposal – Manage any residual that cannot safely or technically be reused, refurbished, or recycled by further separating for energy recovery or disposal in a safe manner in accordance with applicable laws.</p> <p>b) Periodically evaluate management strategies to incorporate new, more effective technologies and continuously improve practices and processes where feasible within the context of the hierarchy.</p>	
	SECTION 2: COLLECTION	
1.	Fees	Collection
	<p>CEDs collected for the OERP must be collected from covered entities free of charge except for the following services: Premium services as described in an approved plan to cover the costs not paid by the State contractor or manufacturer program.</p>	
2.	Legal requirements	Collection
	<p>In addition to the requirements in this document, collectors must:</p> <p>a) Not dispose of whole CEDs through landfilling or incineration, beginning January 1, 2010.</p> <p>b) Comply with all applicable local, state, and federal requirements, including but not limited to environmental, health, and safety requirements;</p> <p>c) Notify DEQ if their facility receives a fine or notice of violation that is not corrected within 30 days; and</p> <p>d) If exporting, comply with all legal requirements that are applicable to the importation, operations, and transactions of each transit and recipient country and document its downstream vendors' adherence to such legal requirements.</p>	
3.	Service standards	Collection
	<p>When providing collection services for the OERP, the collector must:</p> <p>a) Staff the site during operating hours;</p> <p>b) Provide covered storage areas so that the collected CEDs are protected from the weather;</p> <p>c) Handle and store CEDs to minimize breakage; (A) Cleanup spilled and broken CEDs immediately; manage according to established solid waste management laws and regulations; (B) Adhere to good housekeeping standards, including keeping all storage areas clean and orderly.</p> <p>d) Make available CED recycling information that is provided by the program(s) for which the collector is providing services or from the DEQ; and,</p> <p>e) Cooperate, when needed, with CED sampling efforts conducted by the State contractor and manufacturer recycling programs.</p>	
4.	Reuse and refurbishment	Collection

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	<p>When screening CEDs for reuse or refurbishment, collectors must:</p> <ul style="list-style-type: none"> a) Post, in a readily visible location, information that informs covered entities that the CEDs are screened for reuse or refurbishment; b) Follow the generator's preference if the covered entities indicate they do not want their CEDs reused or refurbished; c) Triage and screen appropriately for reuse or refurbishment; d) Track separately the number of screened units which are sent for reuse and refurbishment; e) Ensure that CEDs designated for reuse and refurbishment are packaged in a manner that minimizes damage them during transportation; and f) Obtain written certification from the vendor(s) that the screened units are going for reuse and refurbishment and that the unusable units will be recycled using environmentally sound management practices as described herein. g) Store whole products, components, and equipment destined for reuse or refurbishment in a manner that: <ul style="list-style-type: none"> I. Protects them from adverse atmospheric conditions and floods; II. Is secure from unauthorized entrance; and III. Is in clearly labeled containers and/or storage areas. 	
5.	Recordkeeping	Collection
	<p>Comply with applicable state and local recordkeeping requirements, including Oregon Material Recovery Survey reporting requirements (OAR 340-090-0100), and any CED reporting and tracking requirements for the OERP.</p> <ul style="list-style-type: none"> a) Track CEDs, either by weight or number of units, coming from covered entities separately from non-covered entities. b) Track and maintain documentation where outgoing CEDs are sold, shipped or transferred. 	
6.	Authorizing access	Collection
	<p>A collector must allow access to DEQ or their authorized third party representative for purposes of conducting sampling/counting to determine return share or assessing compliance with these EMPs.</p>	
7.	Multiple programs	Collection
	<p>A collector may provide service to more than one program. The collector must maintain records of the number or weight of CEDs collected separately for each program.</p>	
8.	Insurance	Collection
	<p>Possess adequate comprehensive or commercial general liability insurance to cover potential risks and liability associated with the</p>	

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	nature and size of the collector's operations.	
9.	Site management	Collection
	Accumulating CEDs, components, or materials derived from CEDs that are in need of further off-site processing for more than 180 days without recycling at least 75% of what was accumulated at the beginning of that period may be considered speculative accumulation and operating a storage or disposal facility under OAR Chapter 340, Divisions 93 – 97 and may require a solid waste or hazardous waste permit.	
	SECTION 3: TRANSPORTATION	
1.	Legal requirements	
	Ensure that all transportation of CEDs and CED components complies with all applicable transport laws and rules.	Transportation
	SECTION 4: RECYCLING	
1.	Legal requirements	Recycling
	<ul style="list-style-type: none"> a) Comply and maintain compliance with all applicable federal, state, and local environmental, health, and safety legal requirements. b) If exporting, comply with and be able to document compliance with all laws of the transit and recipient countries applicable to operations and transactions in which it engages. c) a) and b) above include, but are not limited to, applicable legal requirements relating to: <ul style="list-style-type: none"> 1) Waste and recycling processing, storage, handling, and shipping; 2) Air emissions and waste water discharge, including storm water discharges; 3) Worker health and safety; and 4) Transboundary movement of electronic equipment, components, materials, waste, or scrap for reuse, refurbishment, recycling, or disposal. d) Upon request from a customer, make available to the customer information about any fines, regulatory orders, or violations received in the previous three years related to the requirements outlined in the EMPs. For any subsequent fines or regulatory orders, make that information available within 60 days after any subsequent fines or regulatory orders are issued. 	
2.	Environmental, health, and safety management systems (EHSMS)	Recycling
	<ul style="list-style-type: none"> a) Develop, document, implement, and update at least annually an EHSMS. The written EHSMS includes the following: <ul style="list-style-type: none"> 1) Written goals and procedures to systematically manage environmental, health, and safety matters. 2) Use a “plan, do, check, act” model that identifies environmental and health risks and requirements, 	

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	<p>implements operational controls, and provides corrective action procedures.¹</p> <p>3) Plan for responding to and reporting exceptional releases, accidents, spills, fires, explosions, and other out-of-the-ordinary events that pose risks to worker safety, public health, or the environment. Provide plan to all appropriate emergency responders.</p> <p>4) Procedure for identifying and evaluating the environmental, health, and safety impacts of downstream vendors and for using this information in the selection of downstream vendors.</p> <p>5) Consistency with generally recognized standards that cover environmental and worker health/safety management such as ISO 14001, the International Association of Electronics Recyclers (IAER) certification standard, or the Recycling Industry Operating Standard (RIOS), or a similarly rigorous in-house standard.</p> <p>b) Ensure all workers understand and follow the portions of the EHSMS relevant to the activities they perform.</p>	
3.	Recordkeeping	Recycling
	<p>a) Maintain business records sufficient to demonstrate the material flow of the CEDs, components, and materials that pass through the recycler's facility. This can be done by:</p> <p>1) Maintaining commercial contracts, bills of lading, or other commercially-accepted documentation for all transfers of CEDs, components, and materials into and out of the facility, including brokering transactions.</p> <p>2) Keeping documentation for at least three years.</p>	
4.	On-site operating practices	Recycling
	<p>a) General</p> <p>1) Possess the expertise and capability to process each type of equipment, component, and material it accepts in a manner protective of worker safety, public health, and the environment.</p> <p>2) Use safe materials handling, storage, and management practices, including good housekeeping standards and keeping all work and storage areas clean and orderly.</p> <p>3) Comply with all applicable federal and state OSHA standards.</p> <p>4) Designate an employee or consultant to coordinate and</p>	

¹ Elements of this model include: Plan – (a) Identify environmental and worker health/safety impacts and legal and regulatory requirements; (b) Establish environmental goals, objectives, and targets; (c) Plan actions that work toward achieving identified goals; (d) Plan for emergency preparedness and response; and (e) Identify management support. Do – (a) Establish roles and responsibilities for the EHSMS and provide adequate resources; (b) Ensure staff are trained and capable of carrying out responsibilities; and (c) Establish a process for communicating about the EHSMS. Check – (a) Monitor key activities and track performance; (b) Identify and correct problems and prevent recurrence; and (c) Provide a measurement system. Act – (a) Conduct annual progress reviews; (b) Act to make necessary changes to the EHSMS; (c) Create and implement an action plan for continual improvement.

	<p>promote worker health and safety.</p> <p>5) Use a certified scale to weigh CEDs that are reported as recycled through the OERP.</p> <p>b) Workforce and environmental protection</p> <p>1) Conduct on an ongoing basis a hazards identification and assessment of occupational and environmental risks that exist or could reasonably be expected to develop at the facility. Such risks, for example, could result from sources such as emissions of and/or exposure to substances,² noise, ergonomic factors, thermal stress, substandard machine guarding, cuts and abrasions, etc. The hazards identification and assessment is captured in writing and incorporated as a component of the EHSMS.</p> <p>2) Manage the hazards and minimize the releases identified using an appropriate combination of strategies, including but not limited to the following:</p> <p>I. Engineering controls such as:</p> <ul style="list-style-type: none"> a) Substitution (e.g. replacing a toxic solvent with one less toxic), b) Isolation (e.g. automating a process to avoid employee exposure), or c) Ventilation and, if appropriate, capture (e.g. fume hood), d) Dust control, capture, and clean up, and e) Emergency shut-off systems, and f) Fire suppression systems, <p>II. Administrative and work practice controls including appropriate combinations of:</p> <ul style="list-style-type: none"> a) Regular, documented health and safety training that covers information from the hazardous assessment, safe management handling, spill prevention, engineering controls, equipment safety, and use and care of personal protection equipment; with training for new hires and refresher courses for all employees that is understandable to them given language and level-of-education considerations, b) Job rotation as feasible given workforce size, c) Safe work practices, d) Medical surveillance, 	
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² Risks posed by exposure to substances may arise in a variety of situations – sometimes involving substances that do not under ordinary conditions pose a risk to worker safety or the environment. Substances, for example, may include mercury, lead, beryllium, cadmium, PCBs, some phosphor compounds, certain brominated flame retardants (i.e. polybrominated biphenyls, pentabrominated diphenyl ether, and octabrominated diphenyl ether), silica dust, chlorinated or brominated dibenzodioxins and dibenzofurans, and hexavalent chromium.

	<p>e) Safety meetings.</p> <p>III. Personal protective equipment, such as respirators, protective eyewear, cut-resistant gloves, etc. as appropriate for the risks involved and the tasks being performed.</p> <p>Incorporate hazard management strategies as a component of the EHSMS.</p> <p>3) Use monitoring and sampling protocols to provide assurances that the practices employed are effectively and continuously managing the risks identified. This includes complying with all applicable Federal or State OSHA standards and permissible exposure limits (PELs) for sampling and/or monitoring.</p> <p>4) Treat the workforce, including volunteer workers, temporary workers, and anyone else performing activities in a recycling facility, using the standard of care described in section 2) of this provision.</p> <p>5) Designate a qualified employee or consultant to coordinate promotion of worker health and safety. This individual is identified to all employees and two-way communication is encouraged between employees and this individual regarding potential hazards and how best to address them.</p> <p>c) Materials separation and processing</p> <p>1) Materials of concern include the following:</p> <ul style="list-style-type: none"> a. Any mercury bearing lamps or devices or PCBs; b. Batteries; c. Cathode ray tubes (CRTs) and leaded glass; and d. Circuit boards <p>2) Separate CEDs and CED components that are or contain materials of concern that would pose risk to worker safety, public health, or the environment during subsequent processing; or</p> <p>3) If processed prior to removal, store processed materials of concern in containers sufficient to prevent a release to the environment or threat to human health, and handle them in a manner consistent with the regulatory requirements that apply to the items, or any substances contained in them, in a secured, sheltered enclosure with an appropriate catchment system as warranted. Cover or otherwise effectively separate battery terminals during storage and shipment to prevent short circuiting.</p> <p>d) Storage</p> <p>1) Store materials of concern as described in c) above in a manner that:</p> <ul style="list-style-type: none"> I. Protects them from adverse atmospheric conditions and floods and, as warranted, includes a catchment system; 	
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	<p>II. Is secure from unauthorized entrance; and III. Is in clearly labeled containers and/or storage areas.</p> <p>2) Store whole products, components, and equipment destined for reuse in a manner that:</p> <p>IV. Protects them from adverse atmospheric conditions and floods and, as warranted, includes a catchment system;</p> <p>V. Is secure from unauthorized entrance; and VI. Is in clearly labeled containers and/or storage areas.</p> <p>e) Through training and preparation be able to immediately implement response practices designated in the facility's EHSMS to report and address any releases that could pose a risk to worker safety, public health, or the environment including emergencies such as accidents, spills, fires, and explosions.</p> <p>f) Manage materials of concern both on-site and in the selection of downstream vendors to which materials of concern, or whole or shredded equipment or components containing materials of concern, are sent using the practices described in this subsection 4.</p>	
5.	Separation and recycling of materials	Recycling
	<p>a) Dismantle, separate, or mechanically process, as appropriate, the CEDs and components from which raw materials are to be recovered into separate "streams" as appropriate to generate value, minimize waste, and enable safe management through to final disposition.</p> <p>b) Conduct due diligence, or use documented due diligence that others have performed, on each downstream vendor sent materials for recovery by obtaining a written contractual commitment, or a written certification from the vendor, or other certified documentation, such as an audit report prepared by a certified auditor, that they have verifiable records demonstrating they meet the EHSMS practices outlined in subsection 2, and are in compliance with its environmental and worker safety legal obligations.</p> <p>c) Accumulating CEDs, components, or materials derived from CEDs that are in need of further off-site processing for more than 180 days without recycling at least 75% of what was accumulated at the beginning of that period may be considered speculative accumulation and operating a storage or disposal facility under OAR Chapter 340, Divisions 93 – 97 and may require a solid waste or hazardous waste permit.</p>	
6.	Management of residuals from CED recycling.	Recycling
	<p>b) Direct materials with high BTU value to energy recovery only if the energy recovery facility is designed to safely manage any "materials of concern" and the substances</p>	

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	<p>they contain.</p> <p>c) Materials and residuals from processing that cannot be reused or recycled may be disposed of at solid waste landfills or incinerators, and the landfill or incinerator receiving the material is operating in compliance with all applicable permits and laws, and the materials are not determined to be a hazardous waste, requiring management at a hazardous waste facility.</p> <p>d) If the stream being managed contains any materials of concern, ensure any by-products or wastes produced at the facility are managed safely.</p>	
7.	Due diligence downstream	Recycling
	<p>a) Implement practices that establish and maintain a written record, such as shipping documents, database extracts, or other documents that identify where any CEDs, components, or materials (including materials of concern) that are recycled from the time the equipment, components, or materials leave the facility through to the point at which materials become a single material commodity suitable for final processing.</p> <p>b) Obtain from each downstream vendor where materials and materials of concern are sent, a written contractual commitment and verifiable business records or a third-party audit, or use documented due diligence that others have performed, verifying that the downstream vendor conforms to the following practices in this document:</p> <ol style="list-style-type: none"> 1) Legal requirements in subsection 1. 2) EHSMS in subsection 2. 3) Recordkeeping in subsection 3. 4) Operating practices in subsection 4. 5) Separation and recycling of materials in subsection 5. 6) Management of CED components and materials that are not reused or recovered in section 6. <p>c) Obtain a written statement from immediate downstream vendors where CEDs, components, materials, or materials of concern are sent that those vendors maintain written documentation of where materials go when they leave their facility in order to assure a downstream chain of documentation is in place.</p> <p>d) Maintain access to the downstream chain of documentation through to the point at which CEDs, components, materials, and materials of concern become a material suitable for final processing and review downstream vendors' conformity to the practices listed in b) above. Check conformity at least every two years and more frequently if changes in circumstances warrant.</p>	
8.	Insurance	Recycling
	a) Possess adequate comprehensive or commercial general	

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	<p>liability insurance to cover potential risks and liability associated with the nature and size of the recyclers' operations including coverage for:</p> <ol style="list-style-type: none"> 1) Bodily injury, 2) Property damage, 3) Pollutant releases, 4) Accidents, and 5) Other emergencies 	
9.	Closure plan and financial responsibility	Recycling
	a) Prepare and keep current a written plan for facility closure and a sufficient financial instrument (e.g. bonds, trust fund, or letter of credit) that assures proper closure of the facility and assures against abandonment of any CEDs, components, or materials at the facility.	
10.	Data sanitization/destruction	Recycling
	<ol style="list-style-type: none"> a) Data sanitization or destruction is not required. b) If a recycler does sanitize or destroy data on hard drives and other data storage devices for its customers, adherence to the National Institute of Standards and Technology (NIST) Guidelines for Media Sanitation or certification by the National Association of Information Destruction (NAID) or other generally-accepted programs is recommended. c) If a recycler does sanitize or destroy data on hard drives and other data storage devices for its customers, the recycler should document data destruction processes and procedures. 	
11.	Facility security	Recycling
	<ol style="list-style-type: none"> a) Provide a functioning security program that controls access to all or parts of the facility in a manner appropriate given the type of equipment handled and the needs of the customers served. b) The program, for example, may include such things as photo ID, visitor logs, video surveillance, locked doors, receptionist, security guards, perimeter fencing, securing dock and bay areas when not in use, locking gates and doors to storage and processing areas, and adequate lighting inside and outside of facility. 	

DEFINITIONS

Collection: Means receiving, sorting, screening and preparing for transportation CEDs from covered entities. Collection does not include recycling, reuse, or refurbishment activities.

Collector: Means an entity that conducts and is responsible for collection activities.

Covered Electronic Device (CED): Includes:

- a) Computer monitor of any type with a viewing area greater than four inches measured diagonally;
- b) Desktop or portable, including a notebook, computer; and

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- c) Television of any type with a viewing area greater than four inches measured diagonally.

Does not include:

- a) Any part of a motor vehicle;
- b) Any part of a larger piece of equipment designed and intended for use in an industrial, commercial, or medical setting, such as diagnostic, monitoring, or control equipment;
- c) Telephones or personal digital assistants *unless* they contain a viewing area greater than 4 inches measured diagonally; and
- d) Any part of a clothes washer, clothes dryer, refrigerator, freezer, microwave oven, conventional oven or range, dishwasher, room air conditioner, dehumidifier, or air purifier.

Downstream Vendor: Any entity to which a collector or recycler transfers used or end-of-life CEDs, components, or materials for demanufacturing, processing, materials recycling, energy recovery, and disposal.

Materials of Concern: Include each of the following, and any CEDs or component, or any aggregate material(s) derived from end-of-life CEDs or components (e.g. shredded, granulated, or mixed materials) containing:

- a) Any devices, including fluorescent tubes, containing mercury or polychlorinated biphenyls (PCBs)
- b) Batteries
- c) Cathode Ray Tubes (CRTs) and leaded glass
- d) Circuit boards

These items are included because of their potential for improper handling or management that could result in risk to worker safety, public health, or the environment.

Recycler: Means someone who is conducting recycling activities for the OERP.

Recycling: Means processing through disassembling, dismantling, shredding, transforming, or remanufacturing CEDs, components, and by-products into usable or marketable raw materials or products in a manner such that the original products may lose their identity. Recycling does not include collection, direct reuse of CEDs, refurbishing, energy recovery, or disposal.

Refurbish: Means to repair a used CED in order to restore or improve it so that it may be used for the same purpose for which it was originally designed.

Reuse: Means any operation by which a CED or component of a CED changes ownership and is used, as is, for the same purpose for which it was originally purchased.