



DEQ

State of Oregon
Department of
Environmental
Quality

Directive

Title:	E-Waste Handling Facility Permitting & Compliance	FORM C
Original Author:	Audrey O'Brien	Pages:4
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Approval:	<i>Wendy Wilson</i>	

Scope:

This directive defines e-waste, categorizes e-waste handling facilities, describes potential environmental concerns at these facilities, determines when an e-waste handling facility needs a solid waste permit, describes what should be in the permit, and outlines inspection and technical assistance guidelines.

Purpose/Need:

The purpose is to address potential environmental concerns at e-waste handling facilities and coordinate permitting and compliance work done by solid waste and hazardous waste staff.

This directive applies to e-waste handling facilities but does not apply to transporters of e-waste (regulated by ODOT, local hauling franchises, etc.). Facilities that only repair electronics for resale are not defined as handling waste. This IMD is not intended to address some types of electronic waste such as white goods (household appliances containing circuit boards). These materials must still be managed appropriately to address potential hazardous waste or other environmental concerns. If some time in the future DEQ determines that white goods require more scrutiny, DEQ will amend this IMD or create a new one.

Legal Authority:

ORS 459, 465, and 466; OAR 340-093, 095-097, 102. See Attachment A, Guidance for Inspectors Regarding Management of Electronic Waste, for details on relevant statutes and administrative rules.

Discussion:

Electronics waste recycling is a growing sector in Oregon. The electronics waste stream is expected to grow due to increasing electronics in the marketplace as well as Oregon's E-cycle program initiated in January 2009 and the landfill ban on covered electronic devices slated to go into effect in January 2010. Since electronics contain hazardous materials such as lead, mercury and cadmium, storage and handling must meet solid and hazardous waste requirements to protect human and environmental health. This sector has been under scrutiny for sham recycling. HW and SW inspectors have discovered several instances of mismanagement of e-waste through complaints. In addition, DEQ has not had a systematic, consistent approach to solid waste permitting and inspecting e-waste facilities and to hazardous waste regulation of small and large quantity generators who generate hazardous waste from e-waste. This IMD identifies a methodical approach that DEQ staff will use to address potential threats to Oregon's environment and human health regarding the safe collection and handling of e-waste.

Directive:

Definition of e-waste: E-waste is defined as electronic devices used in the work-place and at home that have been discarded or are intended to be discarded by the owner. These devices may contain toxic or hazardous substances such as lead or mercury. E-waste includes 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 existing or future types of equipment that are designed primarily to store or convey information electronically and any accessories to such equipment.

Categories of e-waste handling facilities: DEQ is categorizing e-waste handling facilities by their activities. Environmental concerns increase as facilities carry out more activities. The categories are listed in order of increasing potential for environmental concern.

Collector: A collector takes e-waste in and prepares it for shipping out with minimal handling and may store it for some period of time.

Disassembly, dismantling and remanufacturing (DDR): A DDR facility disassembles devices by taking them apart, dismantles devices by popping rivets, breaking or cutting components apart, or reconfiguring them, and/or remanufactures devices by mining them for parts or putting devices back together using parts from various units. Residual waste is sent for disposal or additional recycling.

Shredding, grinding, or breaking CRTs and other e-waste: These facilities intentionally break CRTs, computers and other e-waste most often through grinding or shredding for the purpose of material recovery. Residual waste is sent for disposal or additional recycling. Shredding for purposes of disposal may require a SW treatment permit.

Transformers: These facilities use processes such as smelting or refining to recover materials.

Environmental concerns according to e-waste categories:

Environmental Concerns & Regulatory Compliance	Collectors	DDRs	Shredder or Grinder	Transformer
Exposure to stormwater contributing to water quality impacts	X	X	X	X
Exposure to elements that could result in breakage and exposure to hazardous substances or water quality impacts	X	X	X	X
Fire hazards	X	X	X	X
Vectors (similar to those seen at landfill or other disposal sites) such as rats, mice, insects, birds, or bats. These vectors could cause exposure to diseases or viruses harmful to humans or other animals. If materials accumulate water, they may become breeding grounds for mosquitoes.	X	X	X	X
Inadvertent breakage may create HW that must be handled & disposed of properly	X	X	X	X
Security of the facility	X	X	X	X
If the facility activities generate HW, HW may not be appropriately or adequately labeled or there may be no labeling.	X	X	X	X
Volume of material stored: Speculative accumulation is treated slightly differently between SW and HW. For SW purposes, speculative accumulation occurs if material is onsite longer than 6 months. For HW purposes, speculative accumulation occurs when <75% of material on site has been sent for recycling since the start of the calendar year and no markets are identified for the materials.	X	X	X	X
Lack of appropriate documentation to substantiate recycling activities. Minimum required is where, what, how much, and when e-waste was received and where it went, how, and to whom.	X	X	X	X
If CRT's are shipped out of the country for recycling, the facility needs to inform EPA and receive EPA confirmation. If shipped out for reuse, facility needs to notify EPA.	X	X	X	X
Possible illegal disposal of source separated recyclables or sham recycling	X	X	X	X
Potential for creating lead or other metal dust		X	X	X
Possible air or wastewater discharges		X	X	X
Other toxic dust, gels, or liquids		X	X	X
Could become HW generator by activities at facility		X	X	X
More likely breakage, shredding/grinding or transforming activities that could cause air quality or water quality problems			X	X
Fluff or dust from grinding or transforming may create HW &			X	X

require HW characterization				
May have sufficient air emissions to need an air quality permit			X	X
May have offsite dust			X	X
Generation & disposal of non-recyclable residues from processing source separated recyclables		X	X	X

Solid waste permit determinations: DEQ has determined permit needs based on each type of facility.

Collector: If the collector has a solid waste permit already, it will be amended 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. A transfer station or material recovery facility (MRF) permit may be issued if the facility does not address environmental concerns. (OAR 340-093-0050(3)(f))

DDR: If a DDR has a solid waste permit, it will be amended to address e-waste handling. If a DDR does not have a solid waste permit, DEQ will evaluate each facility and will require a MRF permit if, after considering all of the following criteria, DEQ staff determine the facility's activities have potential for environmental impact.

- (1) The facility processes more than 100 tons of e-waste per year.
- (2) The facility processes or stores e-waste outside or not under cover and near waterways or wetlands or near a public drinking water supply. Tarping is not considered cover sufficient to protect e-waste from environmental exposure. Materials are exposed to ambient conditions including precipitation, flooding, wind, or other atmospheric conditions.
- (3) The facility is near or in a residence, school, daycare facility, park, or playground or any other locations where children are regularly present. Schools using computer repair and recycling activities as an education tool may not need a permit.
- (4) The facility has had a notice of noncompliance, warning letter, pre-enforcement notice, or penalty order for a WQ, HQ, or SW violation in the past five years, unless the facility is under new ownership and violations occurred under past owners.

Shredder or Grinder: A shredder or grinder will need to get a solid waste MRF permit.

Transformer: DEQ will evaluate each transforming facility on a case-by-case basis to determine if SW MRF or treatment permit is needed. Environmental concerns may be adequately addressed under an AQ or WQ permit or existing facilities may comply with all HW requirements.

New SW permits: DEQ will communicate the requirements for a new permit to existing unpermitted e-waste facilities starting in April 2009 and will work with these facilities in a technical assistance role to help them apply for permits and make sure they are managing e-waste appropriately. By January 1, 2010, any existing or new facility not currently accepting e-waste that wants to start accepting e-waste and meets the criteria requiring a SW permit, must obtain a new permit or obtain a permit amendment before accepting e-waste.

DEQ has prepared a draft permit template and draft operations plan template that are attached to this IMD. In addition to typical solid waste requirements for safe management, storage, and processing, the SW permit will include:

1. Generic HW requirements, downstream due diligence for all e-waste recyclers that generate HW, and e-waste specific requirements.
2. The landfill ban for E-Cycles Program covered devices (televisions, computers, laptops, monitors).
3. An operations plan to be reviewed by both SW and HW staff that includes any special waste management plan requirements to address spills, breakage or accumulation.
4. Facility closure plans
5. After 2009 rule changes become effective that broaden the requirement for financial assurance, DEQ will require financial assurance for all facilities that shred, grind, or break CRTs and other e-waste. Other facilities will be evaluated on a case-by-case basis.
6. Record keeping and reporting requirements to avoid speculative accumulation and for material recovery survey purposes.

7. Other requirements appropriate for the specific facility.

Existing SW permits: Existing SW permits for collectors and DDRs will be modified to include any appropriate requirements identified above (DEQ does not know of any permitted shredders or transformers in Oregon). DEQ will determine if any permit changes warrant public comment.

Site visits: DEQ will decide priority order of site visits depending on the facility activities, whether it has or needs a SW permit, and its HW generator status. Regional SW and HW managers will consult and determine which program leads all site visits. Many visits during 2009 will be in a technical assistance mode, unless egregious violations of environmental requirements for e-waste are found. Beginning in 2010, site visits will shift to compliance inspections, although any type of facility may request HW TA at any time.

SW permitted facilities will be inspected at least annually (collectors, DDRs, and shredders/grinders).

Non permitted facilities will be inspected periodically according to the priority assigned to the facility (considering, for example, their HW generator status) and DEQ workload and resources available. Regional managers will confer and agree on which program, HW or SW, takes lead, if inspections will be joint inspections, whether TA staff or inspectors will do site visits, etc. At unpermitted DDRs, HW will lead inspections but will consult with SW. These facilities may warrant a joint inspection to determine whether they need permits. For collectors that do not have an existing permit but are in the Oregon E-Cycles Program, DEQ will rely on plan representative audits to determine if site visit follow-up is needed. These will be lower priority for DEQ inspections. Collectors not participating in the Oregon E-Cycles Program will be higher priority for DEQ inspections or site visits. DEQ intends to conduct a site visit at each of these facilities by 2011.

Inspector guidance. Hazardous Waste, Solid Waste and E-Cycles staff and inspectors will share and exchange information and consult one another on facilities and compliance information." SW and HW inspector guidance about the types of e-waste facilities and the kinds of violations to look for during site visits is Attachment A to this IMD. DEQ's enforcement guidance covers these violations. This IMD does not intend to enforce the Oregon E-Cycles Program, so no E-Cycles Program-specific violations are identified in the guidance.

Implementation Plan and Schedule:

Implementation of this IMD will start upon signature and will follow the attached implementation plan and schedule.

Review Schedule:

The periodic review schedule will apply.

Contact Person:

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Disclaimer:

This directive is intended solely as guidance for DEQ employees. It does not constitute rulemaking by the Environmental Quality Commission and may not be relied upon to create an enforceable right or benefit, substantive or procedural, enforceable at law or in equity, by any person. DEQ may take action at variance with this policy.

Attachment A

Guidance for Inspectors/TAs Regarding Management of Electronic Waste

This guidance is intended to be used by solid waste and hazardous waste inspectors or technical assistance staff when they inspect/visit electronic waste facilities that collect; dismantle, disassemble, or remanufacture (DDR); or shred, grind, or break CRTs or other types of e-waste. This guidance summarizes existing solid waste and hazardous waste regulations applicable to facilities that collect or handle e-waste. It also references common but not necessarily all air quality and water quality requirements that may apply to these facilities. It does not include requirements for the Oregon E-Cycles Program, which is monitored through a state contractor program and manufacturer programs and third-party audits. However, DEQ SW and HW inspectors will be inspecting some facilities participating in Oregon E-Cycles to verify that they are complying with solid waste and hazardous waste requirements that apply because they are handling e-waste. Information about Oregon E-Cycles, including a list of facilities participating in the program, can be found at www.deq.state.or.us/lq/ecycle/index.htm.

Before using this guidance, please review the information in the e-waste directive (IMD) that defines e-waste and the types of facilities you may inspect and provides other guidance on the collection and handling of e-waste.

Hazardous waste, solid waste, and Oregon E-Cycles staff and TAs/inspectors will share information and consult one another on facilities and compliance information. A checklist is being created for use when conducting site visits.

Requirements that apply to all e-waste facilities

Regulation	Details
Various	All facilities that collect, store, or process e-waste must comply with applicable local, state, and federal regulations, including applicable SW & HW regulations as well as other environmental, health, and safety regulations.
Speculative accumulation/illegal storage of HW w/o permit, ORS 466.095(a) – Pursuant to 40 CFR 261.2(c)(4) and 261.1(c)(8)	A material that a facility intends to recycle that would otherwise be a HW is “accumulated speculatively” – if it is accumulated before being recycled unless the person accumulating it can show that the material is potentially recyclable and has a feasible means of being recycled; and that during the calendar year (commencing Jan 1) the amount of material that is recycled, or transferred to a different site for recycling, equals at least 75% by weight or volume of that material accumulated at the beginning of the period. Through photographs and documentation, inspectors should note whether the collection of e-waste stored on site is timely and appropriately recycled. If e-waste is accumulated speculatively, SW and HW regulations will apply. Inspectors/TA staff may be able to verify speculative accumulation by records requests after one site visit. However, if no records are available, inspectors may need to conduct multiple site visits to appropriately verify speculative accumulation by documenting amounts through repeated site visits (photographs, etc.).
Speculative Accumulation of SW, Operating a disposal site without a SW permit, OAR 340-093-0050(1)	Per SW policy, if material is accumulated for more than six months, the facility is considered a disposal site. The material must be removed or the owner must apply for a SW permit. Under this policy, a SW

Regulation	Details
	<p>speculative accumulation violation may be documented earlier than a HW one. The same feasible recycling and 75% recycled amount exemptions apply as noted above for HW. If speculative accumulation of SW is documented, the violation is creating, operating, or maintaining an illegal solid waste disposal site.</p>
<p>Illegal disposal of SW, OAR 340-093-0040(1)</p>	<p>If disposal of residuals or recyclable materials is documented on-site (speculative accumulation or otherwise), illegal disposal of solid waste is the violation.</p>
<p>Hazardous waste determination (HWD), OAR 340-102-0011(2)</p>	<p>A person who generates a residue as defined in OAR 340-100-0010 must determine if that residue is a hazardous waste using the following method: (a) Persons should first determine if the waste is excluded from regulation under 40 CFR 261.4 or OAR 340-101-0004; (b) Persons must then determine if the waste is listed as a hazardous waste in Subpart D of 40 CFR Part 261. This includes conditionally exempt generators (Pursuant to 40 CFR 261.5(g)(1). Performing a HWD is one of the thresholds for qualifying as a CEG). Any materials taken from e-waste components as defined above that do not go to recycling but are disposed of instead will require a HWD. Wastes of concern include (all of the following would be HW violations if the materials fail a HW determination): Lead dust contaminated plastic or other materials, fire retardant contaminated materials and broken CRT glass. Facilities that generate a residual, including shredding fluff as a result of their processing, shredding, or grinding of e-waste have generated a new waste and must perform a HWD on the residual. The inspector/TA staff should evaluate</p>

Regulation	Details
	<p>the sampling protocol being used by the facility as part of the evaluation of the HW Determination. If the residual is recycled, it may be excluded from HW regulations. If the residual is HW and is not recycled, it is subject to the generator requirements of 40 CFR 262.34. (Note that CEG and SAA regulations may apply). In addition , any facility that has violated the speculative accumulation requirements for HW must conduct a HWD on the e-waste if they cannot do so by knowledge of process.</p>
<p>Illegal disposal of HW without a permit, ORS 466.100(1) and (2)</p>	<p>If a facility does not comply with HWD requirement or through speculative accumulation or regular generation, the facility becomes a SQG (220 lbs per month HW or 2200 lbs accumulated at any one time) or LQG, then the facility must dispose of HW at a Subtitle C landfill. If they do not, then they have illegally disposed of HW without a permit.</p>
<p>Illegal disposal of source separated recyclables, ORS 459A.080 & OAR 340-090-0090</p>	<p>ORS 459A.080(3) prohibits a person from mixing source separated recyclable material with solid waste "in any vehicle, box, container or receptacle used in solid waste collection or disposal."</p> <p>OAR 340-090-0090(2) more specifically provides that "no person shall dispose of source separated recyclable material which has been collected or received from the generator by any method other than reuse or recycling except for used oil and wood waste which may be collected and burned for energy recovery."</p>
<p>Labeling requirements, 40 CFR 262.34</p>	<p>If HW is stored or managed, the labeling and management requirements of 40 CFR 262.34 apply. For DDRs this will likely apply to e-waste that has been speculatively accumulated or hazardous non-</p>

Regulation	Details
	recycled debris or other material related to DDR activities.
<p>CRT policy violations (interim policy in effect until DEQ adopts EPA rule in June 2009). Applies to e-waste from large or small quantity generators. Facilities will need to separate e-waste received from household hazardous waste generators (HHW) and conditionally exempt generators (CEG) from small/large quantity generators (SQG/LQG).</p>	<p>CRTs that are not being recycled and are broken must have a HW determination made if they came from either small or large quantity generators. If the HW determination results in a CRT failing the HW characteristic for lead, it must be labeled, dated, and follow other HW requirements according to the appropriate generator status.. If a CRT that is being recycled is later determined to be unusable, a HW determination is needed if the CRT was received from a small or large quantity generator or if the facility failed to separate HHW/CEG from SQG/LQG waste. DEQ intends to adopt these federal rules during 2009. The EPA CRT rules require that CRTs must be recycled to avoid HW requirements. The CRT user who decides the CRT cannot be used any longer must know the final recycling destination of the CRT.</p> <p>CRTs to be recycled must be accumulated in a manner that minimizes breakage and is protective to the environment. Any residuals from breakage must be managed in suitable, closed containers that do not leak and cannot be easily crushed to prevent releases of hazardous constituents into the environment. Cardboard Gaylord boxes would not be suitable containers for broken, ground or crushed CRTs. Containers holding broken CRTs must be labeled with words "Broken CRTs for recycling." If not recycled, CRTs must be managed as potential HW. If broken CRTs are exposed to the environment, then HW regulations apply.</p>

Regulation	Details
	Shredders/grinders and transforming facilities must conduct all dismantling or processing inside a building and have applicable permits. Residuals or waste materials generated from the management of CRTs that are destined for disposal or not destined for recycling must be managed as potential HW. A HWD must be performed and if the materials designate as HW, then all applicable HW generator requirements apply.
Water quality concerns: channelized discharges to surface water or wetlands; potential underground injection control points; stormwater sheet flow runoff; construction runoff; discharge to wastewater treatment systems.	Note any water quality concerns and refer to the appropriate program or government. Check with WQ program about possible UIC discharge without a permit. Check with local government or DEQ WQ program about surface WQ discharge without NPDES or WPCF permit or potential violations for not treating wastewater before discharging.
Landfill ban, ORS 459A.305(12)(b)(A) and (5)(a) Each disposal site operator shall establish and implement, in accordance with any permit requirements established by the Department of Environmental Quality, a program reasonably designed to prevent acceptance of covered electronic devices for disposal. If an operator operates the disposal site in conformity with the program, the operator is presumed to have complied with the provisions of this section that prohibit knowingly accepting covered electronic devices for disposal."	Electronic devices covered by Oregon E-Cycles may not be disposed of in landfills, starting Jan. 2, 2010. Covered devices are televisions, computers, laptops, and monitors. If the inspector sees a CED disposed, the inspector will need to evaluate the facility's program to determine whether the operator is following a DEQ approved program designed to prevent acceptance of CEDs for disposal.
Offsite dust violation, OAR 340-208-0450; new emission equipment without Notice of Intent to Construct filed with DEQ AQ program, OAR 340-0210	Note any visible offsite dust issues and refer to DEQ's AQ program for follow up or for help with response. No facility is allowed to have visible offsite dust from their facility operations after DEQ documents the first occurrence and tells the facility to correct the

Regulation	Details
	<p>problem. If DEQ inspectors/TA staff observe offsite dust after a facility has been told to correct this problem, DEQ may refer ongoing offsite dust violations for penalty.</p> <p>Any newly installed or recently installed emission units should have been reviewed by DEQ's AQ program under the Notice of Intent to Construct program. If the equipment has not been evaluated by AQ, refer the concern and the facility to appropriate AQ staff for follow up.</p>
Failure to file material recovery survey, OAR 340-090-100(5)	Materials collected for recycling from households and commercial establishments must be reported annually on the material recovery survey. Check with SW HQs to see if the company is filing or needs to file.
Lack of appropriate documentation for management of HW	If e-waste is not being recycled or speculatively accumulated and it designates as HW, then all the appropriate documentation is needed based on the generator status of the facility. This would include recordkeeping, notification requirements, documentation of appropriate training, labeling requirements and all the appropriate documentation for safe management and disposal of HW for either SQG or LQG or proof that the facility is a CEG or only handling HHW. Documents that inspectors/TA staff should check for include: receipts for incoming e-waste, bills of lading or shipping receipts that document where, to whom and when e-waste is shipped offsite, landfill disposal receipts or records of disposal, and HW manifests if needed.
Worker health and safety issues, various regulations	Inspectors/TA staff should be aware of regulations that address worker exposures to hazardous

Regulation	Details
	<p>materials and hazardous wastes. These regulations require recyclers who perform authorized treatment to ensure that workers/handlers who process the electronic devices are thoroughly familiar with the hazards associated with such processing and that they have access to the proper procedures and protective equipment necessary to conduct the processing safely. In addition, the regulations require handlers who process e-waste to comply with all applicable worker health and safety laws and regulations including: OR OSHA, DOT, and the Fire Marshal. If inspectors/TA staff identify poor housekeeping practices such as dust is present and uncontrolled, staff should refer the facility to OR OSHA for consultation or make a referral to OR OSHA. If DEQ staff visit the facility in a TA mode, then recommend the facility contact OSHA's consultant program which provides TA to facilities.</p>
Fire safety concerns	<p>Staff should consider a referral to the Fire Marshal if chemicals and hazardous materials are stored on-site in large volumes or the quantity of e-waste seems disproportionate for the building.</p>

Requirements that apply to e-waste facilities that have SW permits.

Regulation	Details
Violating permit or operations plan conditions, OAR 340-093-0050(6) and (7). OAR 340-096-0040	<p>Permit requirements are identified in OAR 340-093 and 096 and may vary depending upon the type of permit issued. DEQ anticipates that collectors if required to have a permit will have a SW transfer station or material recovery facility permit. DDRs will most likely have SW material recovery facility permits. Shredders/grinders will most likely have a material recovery facility permit or possibly a SW treatment permit. A transformer will be evaluated to determine if existing permits adequately address environmental concerns. If a SW permit is needed, it may be a material recovery facility permit or a treatment permit.</p> <p>Permit requirements will include DEQ approval of site characterization, plans and specifications, operations plans, any required financial assurance, and other requirements designed to assure safe handling, management and disposal of e-waste to avoid environmental and human health impacts. E-waste facilities are disposal sites as defined by ORS Chapter 459, and are also subject to the requirements of OAR Chapter 340, Divisions 93, 95 and 97 as applicable.</p>
Exceeding permit or operating plan limits, OAR 340-093-0050(6)-(7)	Permits may include limits on the amounts of materials stored, processed or managed on site. These limits may be exceeded if the facility speculatively accumulates e-waste on site.

Note: If an inspector documents violations of SW permit conditions, the inspector should check if the permit condition is established to carry out a specific rule requirement. Enforcement of rule violations can be addressed through warning letters or pre-enforcement notices that refer violations for penalty orders. Permit condition violations that are not also rule or statutory violations require notices of permit violations which take significantly more time to complete.

Specific Exemptions that may apply to e-waste facilities:

Each participating facility will need to very carefully manage their recycling programs to ensure that the e-waste does not speculatively accumulate or become discarded so that HW requirements are triggered.

Some household hazardous waste facilities may act as E-cycles collection facilities only. Those facilities are not subject to HW regulation if the covered electronic devices are handled properly because there is an assumption in the law that the covered electronic devices are coming from households or small businesses so they are treated as household hazardous waste or conditionally exempt generator waste. However, in order to maintain the household hazardous waste designation the Collection/Storage/Processing facility will have to keep that household E-cycles e-waste segregated from E-waste from other sources.