

e-Stewards® Standard  
for Responsible Recycling and Reuse  
of Electronic Equipment©

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Version 2.0

November 1<sup>st</sup>, 2013





# The e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment®

## Version 2.0

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This is the second edition of the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment® and will be known by that name followed by the qualifier “Version 2.0”. This Standard is available at [www.e-stewards.org](http://www.e-stewards.org).

Amendments issued since publication of the most recent version of the Standard are updated and only made available in the current Sanctioned Interpretation document on the e-Stewards website, at [www.e-stewards.org](http://www.e-stewards.org)

The e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment: Version 2.0® will cancel and replace the first edition (e-Stewards Standard for Responsible Recycling and Reuse® 1.0, July 15, 2009), eighteen months after the publication date of Version 2.0.

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## FOREWORD

The e-Stewards® Standard and accredited third party certification program were initiated at the request of leaders in the recycling and refurbishment industries, in order to better distinguish their businesses in a marketplace where some practices result in profound negative impacts on the global environment and human health, and fail to meet customers' needs for responsible recycling.

The development of this Standard was led by the Basel Action Network (BAN), a non-profit organization working globally to prevent the illegal and unjust trafficking of hazardous waste, based on the United Nations' *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*.

The ongoing work of preparing and revising the standard is accomplished using a multi-stakeholder process with leaders in the industry via the e-Stewards Leadership Council and its Technical Committee, as well as other experts, such as specialists in health and safety, batteries, and data security. In addition, global norms, as determined within Basel Convention forums, are considered baselines. A public comment process allows the public to provide input into the draft standard. All comments received are then reviewed and considered in preparation of the final standard.

The e-Stewards Standard is maintained and revised at appropriate intervals through an ongoing mechanism of formal multi-stakeholder revisions, as industry and technology advance and as further research identifies risks and hazards prevalent in this industry. Between major revisions of the Standard, the e-Stewards program administrator publishes the e-Stewards Sanctioned Interpretations as needed, found at [www.e-stewards.org](http://www.e-stewards.org), in order to clarify language or make formal changes in requirements. All Organizations seeking certification must meet requirements in both the e-Stewards Standard and the current Sanctioned Interpretations (if any).

This second edition, the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment: Version 2.0®, November 1, 2013, cancels and replaces the first edition (The e-Stewards Standard for Responsible Recycling and Reuse®: Version 1.0, July 15, 2009), eighteen months after the publication date of Version 2.0. However, all certification audits, including surveillance and re-certification audits, conducted after 6 months following the publication of Version 2.0 (i.e. after May 1, 2014) must be conducted against Version 2.0 of the Standard.

### Governance of Stewards certification program

The e-Stewards® Standard is owned and copyrighted by the Basel Action Network (BAN), a non-profit public interest group, for use in an accredited third party audited certification program. BAN is led by its board of directors with considerable guidance on this program from the e-Stewards Leadership Council and their Technical Committee. BAN and/or its licensed program administrator provide oversight of the accreditation and certification functions (conformity assurance), the Standard, and proper usage of the e-Stewards mark.

### Structure of e-Stewards conformity assurance program

The e-Stewards certification program is based on global standards for accreditation (ISO 17011) and certification bodies (ISO 17021), and invokes norms and guidance published by the International Accreditation Forum (IAF).



**Figure 1: Structure of e-Stewards Certification Conformity Assurance**

## INTRODUCTION

### Welcome to e-Stewards Certification

Welcome. In becoming an e-Stewards recycler, you join an elite group of businesses that are recognized as the world's best recyclers and asset managers of used Electronic Equipment. By becoming an e-Stewards recycler you also become part of a much larger e-Stewards community that is made up of many more stakeholders, including concerned consumers, environmental groups, enterprise companies, non-profits, universities, local governments, policy makers, and others that have learned that it does indeed matter *how* used Electronic Equipment is managed and traded--domestically and internationally. These stakeholders have joined together to help create, and now foster and spread, the e-Stewards certification and ethic into every neighborhood and country.

Beginning as a vital tool in the United States and Canada to promote much needed conformity with the Basel Convention - established international waste trade law - the e-Stewards Standard is now available for use all around the world. Certified e-Stewards recyclers range from non-profits to small family businesses to multi-billion dollar transnational companies. While e-Stewards recyclers and the greater e-Stewards community are a diverse group, they all share the common bond of a desire to be leaders. Such leadership embraces the notion of the "triple bottom line" that defines success not just in financial terms, but also by the kind of social and environmental legacy one leaves future generations.

### Purpose and value of the e-Stewards Standard

The e-Stewards® Standard is established and copyrighted by the Basel Action Network (BAN) for use in an accredited third party audited certification program. It was created in partnership with leaders in the recycling industry to provide rigorous, yet practical operational criteria for globally responsible recycling and refurbishing of Electronic Equipment.





The Standard is unique in that it requires consistent conformity by an entire corporate or organizational entity (e.g. with multiple facilities or assets), not just individual facilities within such an entity. In addition, the Standard provides a verifiable and operational framework with specific performance requirements to:

- ▶ Protect Customer Data and privacy,
- ▶ Protect occupational health and safety, and communities surrounding facilities,
- ▶ Prevent pollution, reduce environmental impacts, and facilitate efficient use of resources,
- ▶ Ensure fair labor practices, specifically excluding forced and child labor, and prison operations for managing hazardous e-waste,
- ▶ Require proper disposal of hazardous e-waste, specifically limiting it from solid waste disposal,
- ▶ Operate in conformity with international laws, treaties, and agreements throughout the Recycling Chain - in essence, preventing toxic waste exports from developed to developing countries, and
- ▶ Ensure that the above criteria are extended downstream of the e-Stewards recycler.

#### Value of the program for e-Stewards Organizations

e-Stewards certification has been available since 2010, and its history has demonstrated that Organizations implementing the e-Stewards management system see a positive impact on their businesses due to their increased ability to:

- ▶ Differentiate their services for customers seeking assurance that their electronics are being managed in an environmentally and globally responsible manner,
- ▶ Reduce worker exposures, injuries, and lost time,
- ▶ Identify and manage environmental, health, safety, and operational risks,
- ▶ Create opportunities for business improvement, improved compliance, and risk reduction, and
- ▶ Lay the groundwork for successful customer audits and regulatory inspections.

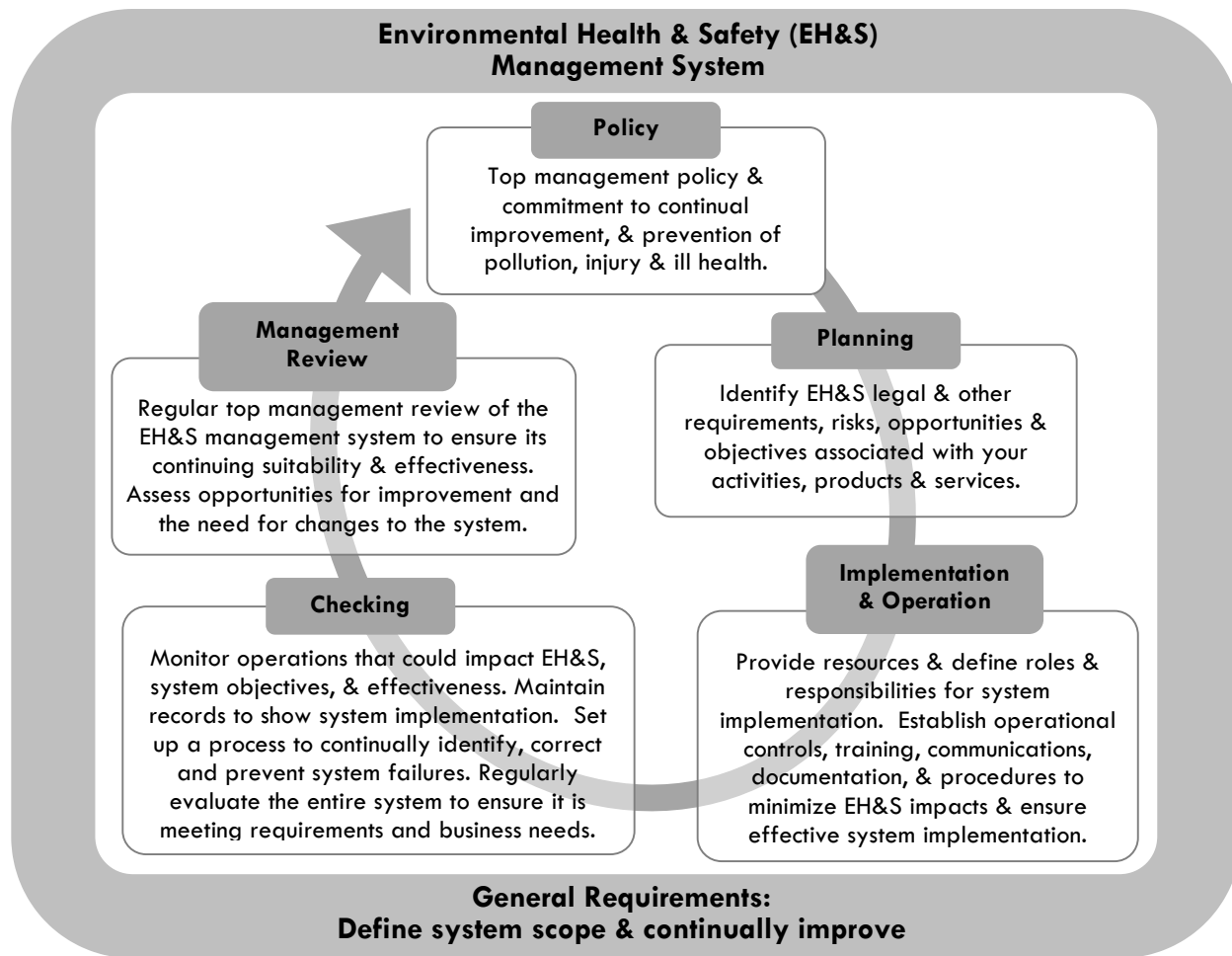
Due to the significant health and safety risks prevalent in the electronics recycling industry, in any country, this Standard has integrated essentially all of the concepts and elements of BS OHSAS 18001, the standard for occupational health and safety management systems. Therefore, even though the e-Stewards Standard does not require certification to BS OHSAS 18001, it should not be difficult to achieve this additional certification, should an Organization choose to obtain it.

#### Overview of environmental, health, and safety management systems

Environmental, health, and safety management systems have been designed to provide a business framework for ensuring that an Organization manages risk and maximizes business value.

In practice, the e-Stewards program provides businesses with a best practices framework to effectively manage the different types of risks it faces, whether they are environmental, health and safety, legal, operational, or customer related. Once established, this system provides a living tool for continually improving business performance.

The following Figure 1 provides a graphic illustration of the process for implementing an e-Stewards certified environmental, health, and safety management system (EHSMS).



**Figure 2 — Simplified overview of environmental, health, and safety management system**

**Appendix A numbering**

For ease of use, the subsection numbers in section 4 of the body of this Standard are reflected in the corresponding subsections in Appendix A. For example, 4.4.6.5 and A.4.4.6.5 both pertain to downstream accountability, and 4.5.1.2 and A.4.5.1.2 both deal with airborne hazards.

**Acronyms used in this Standard**

Key defined terms (see Glossary, section 3) frequently used as acronyms in this Standard:

<b>Acronym</b>	<b>Defined Term</b>
IDP	Immediate Downstream Processor
HEE	Hazardous Electronic Equipment
PCM	Problematic Components & Materials
PHPT	Potentially Hazardous Processing Technologies
HEW	Hazardous Electronic Waste



## ENVIRONMENTAL MANAGEMENT SYSTEMS - REQUIREMENTS WITH GUIDANCE FOR USE

### 1. Scope

*This International Standard specifies requirements for an environmental management system to enable an Organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the Organization subscribes, and information about significant environmental, health and safety, data security, and social accountability aspects. It applies to those Environmental and Stewardship Aspects that the Organization identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria, except as defined by e-Stewards requirements.*

*This International Standard is applicable to any Organization that wishes to*

- a) *establish, implement, maintain and improve an environmental management system in conformity with ISO 14001: 2004 and e-Stewards requirements,*
- b) *assure itself of conformity with its stated environmental policy, and minimize internal and customer risks associated with the environment, occupational health and safety, and data security,*
- c) *demonstrate conformity with this International Standard only by exercising option 4 below*
  1. *making a self-determination and self-declaration (not allowed under e-Stewards requirements), or*
  2. *seeking confirmation of its conformance by parties having an interest in the organization, such as customers (not allowed under e-Stewards requirements), or*
  3. *seeking confirmation of its self-declaration by a party external to the organization (not allowed under e-Stewards requirements), or*
  4. *seeking certification/registration of its environmental management system by an external organization, and specifically by an e-Stewards accredited certification body.*

*All the requirements in this International Standard are intended to be incorporated into any e-Stewards environmental management system. The extent of the application depends on factors such as the environmental policy of the Organization, the nature of its activities, products and services and the location where and the conditions in which it functions. This International Standard also provides, in Annex A<sup>1</sup>, informative guidance on its use.*

The e-Stewards Standard specifies minimum performance requirements for eligible Organizations in the electronics Recycling, asset recovery, Processing, and refining industries, inserted into the framework of the ISO 14001 environmental management system standard. This enables an Organization to develop policies and objectives which also take into account information about significant health and safety, data security, and social accountability aspects of its operation.

The term “environmental management system”, as used throughout this Standard, includes within its scope the environmental, occupational health and safety, data security, social accountability, and other performance requirements identified in this Standard. The scope of the management system also extends to Ancillary Sites owned and/or Controlled by the e-Stewards corporate entity (see Appendix B for more information on Ancillary Sites.)

<sup>1</sup> Annex A of ISO 14001 (guidance) is not provided in the e-Stewards Standard.



## 1.1 Application

### 1.1.1 Integration with ISO 14001: 2004

The e-Stewards Standard fully incorporates the requirements of the international environmental management systems standard, ISO 14001: 2004 © (ISO). It also includes industry-specific performance requirements which are fully integrated into ISO 14001 and are written for use internationally.

For the sake of clarity, regular font indicates the e-Stewards industry-specific performance requirements throughout this Standard, while *italic* font depicts the requirements of ISO 14001: 2004. The font style does not infer greater or lesser importance of the text. Conformance to this e-Stewards Standard requires that both sets of criteria be met in order to receive e-Stewards certification.

The textual requirements of ISO 14001: 2004 are reproduced in full in this Standard, including references to this document as an “International Standard.” Where this phrase is used in *italic* font, “*International Standard*” refers to ISO 14001: 2004, and may also refer to the e-Stewards Standard requirements.

### 1.1.2 New edition of Standard and Sanctioned Interpretations

This second edition of the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment: Version 2.0® (e-Stewards Standard) cancels and replaces the first edition, the e-Stewards Standard for Responsible Recycling and Reuse®: July 15, 2009 (Version 1.0), eighteen months after the issue date of Version 2.0.

In addition, between major revisions of the Standard, the e-Stewards program administrator publishes the e-Stewards Sanctioned Interpretations as needed, found at [www.e-stewards.org/files/SI/e\\_Stewards\\_Sanctioned\\_Interpretation\\_V2.pdf](http://www.e-stewards.org/files/SI/e_Stewards_Sanctioned_Interpretation_V2.pdf), in order to clarify intentions and/or make formal changes in requirements. All Organizations seeking certification must meet (be audited to) requirements in both the current e-Stewards Standard and the current e-Stewards Sanctioned Interpretations.

### 1.1.3 Geographic scope of the e-Stewards certification program globally

e-Stewards certification is available to Recycling entities and their facilities in any country where e-Stewards accreditation and certification bodies are allowed to work. If, however, the candidate entity/facility(s) is located in a country that is not an OECD, EU, or EFTA member country, then their potential e-Stewards certification body(s) must first notify the e-Stewards program administrator of the application to the certification body (CB), and the CB must receive written approval from the program administrator prior to proceeding with a contract for facility certification in any of these countries (i.e. outside of OECD, EU, and EFTA member countries).

### 1.1.4 Eligibility for certification

e-Stewards certification is currently available to entities with facilities that perform significant Recycling of Electronic Equipment, including but not limited to refurbishers, asset managers, dismantlers, shredders, and Materials Recovery operations. Such entities may be owned by for-profit, not-for-profit, non-profit, or public entities. e-Stewards certification is currently not available to Intermediaries, such as Brokers, logistics companies, or entities that only collect Electronic Equipment and/or perform software data sanitization without conducting other Recycling operations (see definition of Recycling). End Processors may contact the e-Stewards program administrator to explore eligibility.



### 1.1.5 Facilities required to become certified

**Corporate certification:** The e-Stewards certification program requires certification of all Recycling facilities located within one country and owned (fully owned or owning a controlling interest) by a corporate, organizational, or government entity. While individual Recycling facilities may receive a site certification, all multi-sited e-Stewards entities shall eventually possess e-Stewards certification of all its eligible Recycling site, as well as all its electronics Recycling subsidiaries, regardless of brand. (See Appendix B for more information.)

**Ancillary Sites:** In addition, all Ancillary Sites associated with a Recycling facility shall be included within the Organization's documented management system. (See Appendix B for more information.)

**Separate electronics Recycling companies with same ownership:** In addition, if the top management or owner(s) of an e-Stewards entity also owns or owns a controlling interest in a separate electronics Recycling entity, all of these Recycling entities and facilities are also required to become e-Stewards certified. (See Appendix B for further details.)

### 1.1.6 Defined terms

e-Stewards-specific terms and requirements defined in the glossary are capitalized throughout this document. ISO-defined terms are not capitalized.

### 1.1.7 Use of the terms "shall" and "should"

The term "shall" is used in this document to indicate those provisions which are mandatory. The term "should" is used in this document to indicate a recognized means of meeting a mandatory requirement of the Standard. An Organization may meet a "should" requirement in an equivalent way, provided that equivalence can be demonstrated to the satisfaction of the Organization's e-Stewards certification body.

### 1.1.8 Requirements in footnotes and appendices

This document contains both footnotes and a number of appendices which contain requirements for those Organizations seeking or maintaining certification. Appendix D does not contain requirements, and is provided for guidance.

### 1.1.9 Hierarchy of legal compliance and voluntary conformity with Standard

Where requirements in this Standard conflict with legal requirements, or the Organization is required by law to manage electronic equipment in specific ways, the law will prevail. However, where this voluntary Standard is not in conflict with laws, the e-Stewards requirements shall be implemented; for example, the e-Stewards definition of Hazardous Electronic Waste and export restrictions go beyond laws in some countries, and thus shall prevail for all e-Stewards Organizations, except where in direct conflict with such laws.

### 1.1.10 Restricted use of this Standard

An Organization may only claim to meet this Standard and/or be an e-Stewards recycler if the Organization is currently certified by an accredited e-Stewards certification body and is currently licensed to use the e-Stewards name and logo by the Basel Action Network or its program administrator.

This Standard may only be used as part of e-Stewards accredited certification, a third-party audited, accredited certification program, as licensed by the Basel Action Network. Its use in any other way, other than for informational purposes, is not authorized.



## 2 NORMATIVE REFERENCES

ISO 14001: 2004 (fully incorporated into this standard)

SA8000 (not provided)

## 3 GLOSSARY OF TERMS

ISO 14001:2004(E) terms and definitions, with additional non-italicized additions for e-Stewards definitions

*For the purpose of this document (ISO 14001), the following terms and definitions apply.*

*NOTE: When a paragraph number reference appears in parentheses within an ISO definition below, this indicates that the preceding word or phrase is cross-referenced to another ISO term defined in this clause.*

*NOTE: A few additions have been made to some of the fundamental ISO definitions in order better integrate e-Stewards performance requirements with ISO 14001; these appear in regular font, while ISO language appears in italic font, as throughout the Standard.*

### 3.1 auditor

*person with the competence to conduct an audit (ISO 9000:2000, 3.9.9)*

### 3.2 continual improvement

*recurring process of enhancing the Environmental Management System (3.8) in order to achieve improvements in overall environmental performance (3.10) consistent with the Organization's (3.16) environmental policy (3.11)*

*NOTE: The process need not take place in all areas of activity simultaneously.*

### 3.3 corrective action

*action to eliminate the cause of a detected nonconformity (3.15)*

### 3.4 document

*information and its supporting medium*

*NOTE 1: the medium can be paper, magnetic, electronic or optical computer disc, photograph or master sample, or a combination thereof.*

*NOTE 2: Adapted from ISO 9000:2000, 3.7.2*

### 3.5 environment

*surroundings in which an Organization (3.16) operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation*

*NOTE Surroundings in this context extend from within an Organization (3.16) to the global system.*



3.6 environmental aspect / Environmental and Stewardship Aspect/Environmental and Stewardship Aspects

element of an Organization's (3.16) activities or products or services that can interact with the environment (3.5), health and safety, social accountability, and/or data security.

NOTE: A significant Environmental and Stewardship Aspect has or can have a significant environmental, health and safety, social accountability, and/or data security impact.

3.7 environmental impact / Environmental and Stewardship Impact/ Environmental and Stewardship Impacts

any change to the environment (3.5), health and safety, social accountability, and/or data security, whether adverse or beneficial, wholly or partially resulting from an Organization's (3.16) Environmental and Stewardship Aspects (3.6)

3.8 environmental management system (EMS) / Environmental Management System / Environmental Management System

part of an Organization's (3.16) management system used to develop and implement its environmental policy (3.11) and manage its Environmental and Stewardship Aspects (3.6). It also includes within its scope the environmental, occupational health and safety, data security, social accountability, and all other performance requirements identified in this e-Stewards Standard.

NOTE 1: A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives.

NOTE 2: A management system includes Organizational structure, planning activities, responsibilities, practices, procedures (3.19), processes and resources.

3.9 environmental objective

overall environmental goal, consistent with the environmental policy (3.11), that an Organization (3.16) sets itself to achieve

3.10 environmental performance

measurable results of an Organization's (3.16) management of its Environmental and Stewardship Aspects (3.6)

NOTE: In the context of Environmental Management Systems (3.8), results can be measured against the Organization's (3.16) environmental policy (3.11), environmental objectives (3.9) and environmental targets (3.12) and other environmental performance requirements.

3.11 environmental policy

overall intentions and direction of an Organization (3.16) related to its environmental performance (3.10) as formally expressed by top management

NOTE The environmental policy provides a framework for action and for the setting of environmental objectives (3.9) and environmental targets (3.12) and includes the environmental, occupational health and safety, data security, social accountability, and all other performance requirements identified in 4.2.



### 3.12 environmental target

*detailed performance requirement applicable to the Organization (3.16) or parts thereof, that arises from the environmental objectives (3.9) and that needs to be set and met in order to achieve those objectives.*

### 3.13 interested party

*person or group concerned with or affected by the environmental performance (3.10) of an Organization (3.16)*

### 3.14 internal audit

*systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the Environmental Management System audit criteria set by the Organization (3.16) are fulfilled*

*NOTE: In many cases, particularly in smaller Organizations, independence can be demonstrated by the freedom from responsibility for the activity being audited.*

### 3.15 nonconformity

*non-fulfillment of a requirement (ISO 9000:2000, 3.6.2)*

### 3.16 organization - Also see definition 3.48 Organization

*company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration*

*NOTE: For Organizations with more than one operating unit, a single operating unit may be defined as an Organization. (See Section 1.1.5 and Appendices B and C for e-Stewards requirements for certifying multiple e-Stewards Recycling facilities with shared ownership.)*

### 3.17 preventive action

*action taken to eliminate the cause of a potential nonconformity (3.15)*

### 3.18 prevention of pollution

*use of processes, practices, techniques, materials, products services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts (3.7)*

*NOTE: Prevention of pollution can include source reduction or elimination, process, product or service changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and treatment.*

### 3.19 procedure

*specified way to carry out an activity or a process*

*NOTE 1: Procedures can be documented or not.*

*NOTE 2: Adapted from ISO 9000:2000, 3.4.5*





### 3.20 record

document (3.4) stating results achieved or providing evidence of activities performed

NOTE: Adapted from ISO 9000:2000, 3.7.6

## e-Stewards Standard Terms and Definitions

### 3.21 Ancillary Sites

Locations or operations owned, leased, or Controlled by the Organization, other than Recycling facilities, which serve as sites for collection, receiving, sorting, consolidating, warehousing, storing, cross-docking, administration, retailing, wholesaling, and/or web-based selling of Electronic Equipment, and any other activities not covered by the term Recycling but involving management of Electronic Equipment.

### 3.22 Annual

Any 12 consecutive month period, with the starting date for the period defined by the e-Stewards Organization, with subsequent one year periods matching the originally defined 12 month period.

### 3.23 Broker

An Intermediary in the Recycling Chain which buys, sells, transfers, or donates Electronic Waste, without significantly<sup>2</sup> Recycling it. Brokers may or may not take physical possession of equipment.

### 3.24 Certified Industrial Hygienist or Equivalent

A health and safety professional who:

- a. Is currently certified by an industrial or occupational hygiene certification agency that is a recognized certification scheme by International Occupational Hygiene Association (IOHA)<sup>3</sup> or other internationally or nationally accredited organization that certifies occupational or industrial hygiene professionals, or
- b. Has spent at least 10 years as a full time (at least 75% of their job duties) trained industrial hygiene professional, or
- c. Has a minimum of 5 years of experience, specific to the electronics recycling industry, as a full time (at least 75% of their job duties) trained industrial hygiene professional.

### 3.25 Commodity

Materials (as opposed to wastes) derived from primary resources (mined or extracted from virgin raw materials) or from secondary materials (recyclables or wastes) which need no further Processing, cleaning, separation, or Recycling<sup>4</sup> and are not destined for Final Disposal<sup>5</sup>, but will instead be:

- a. Sold directly into a market as new consumer products, or
- b. Used as a direct feedstock in primary manufacturing processes, and

<sup>2</sup> For example, cutting cables from devices does not disqualify someone from this definition

<sup>3</sup> Refer to [www.ioha.net](http://www.ioha.net) for the latest listing of IOHA organizations

<sup>4</sup> (i.e. any Basel Convention Annex IV B destinations)

<sup>5</sup> (Basel Convention Annex IV A destinations)



- c. Used in applications which will not release harmful emissions or leachate, or produce hazardous by-products or residues that fail the threshold levels listed in the definition of Hazardous Electronic Equipment, as determined by testing.

### 3.26 Competent Authority

For nations that have ratified the Basel Convention, the Basel definition of Competent Authority applies.<sup>6</sup> For the USA, the definition found in OECD Agreement C (2001) 107/FINAL applies. For countries not party to either of these two instruments, this term refers to the designated government agency responsible for approving transboundary movement (imports, transits, and exports) of hazardous wastes, recyclables, and reusable materials and equipment.

### 3.27 Control

Activities and/or services in which the e-Stewards Organization bills, collects, stores (including off-site or leased storage), transports, Recycles, makes decisions about, represents services as e-Stewards services, and/or otherwise makes arrangements for Electronic Equipment, even if the Organization never takes possession of the equipment or materials.

### 3.28 Customer Data

Any digital or analog data or information located in, on, or about any Electronic Equipment derived from any media, including but not limited to digital memory, magnetic memory, floppy drives, hard or flash drives, audio or video recordings, paper, microfiche, photographs, and labels, which:

- a. Could identify individuals (such as former or current users, owners, employees) or allow discovery of such users or their activities, including information such as Internet Protocol (IP) addresses, email and mail addresses, phone numbers, ID numbers, passwords, correspondence, documents, photographs,
- b. Could identify or allow discovery of information about a corporation or organization and its activities, except for an asset number or code, the corporate name, its logo, and publicly known information about the corporation or organization,
- c. Consists of licensed software, if the electronic device will not be returned to the licensee, or
- d. Consists of financial information of any kind other than sales price of equipment.

### 3.29 Downstream Processor

Any facility which Recycles/Processes or otherwise manages any Electronic Equipment (including materials derived from it) that pass through the e-Stewards Organization's facility or Control. Downstream Processors include initial processors which an e-Stewards Organization arranges to receive/Process customer equipment, if the Organization benefits in any way or represents such services as e-Stewards services. Downstream Processors do not include Intermediaries or Final Disposal Facilities.

### 3.30 Due Diligence (also known as Duty of Care)

The duty to gather necessary information on actual or potential risks involved in business relationships and donations, both direct and indirect, and validating that representations made by another party are complete, accurate, and fully truthful by means of measurement/assessment, examining documentary evidence, direct observations, researching historical and current performance, and

<sup>6</sup> [www.basel.int](http://www.basel.int)



contacting relevant parties to verify the veracity of information. Ongoing Due Diligence requires continual verification of the abilities of other parties to fulfill the agreements, conditions, and requirements of the e-Stewards Organization.

### 3.31 Electronic Equipment

Electrical and electronic equipment and/or components, in any form, e.g. whole, disassembled, shredded, or granulated, including:

- a. Those that are dependent on electric currents or electromagnetic fields in order to work properly and have never contained ozone depleting substances, combustible fuels, or gasses, including equipment for the generation, storage, transfer, and measurement of such currents and fields, and
- b. Associated consumables, e.g. ink and toner and their cartridges, compact and other discs, and accessories, such as batteries, chargers, and adapters.

### 3.32 e-Waste or Electronic Waste

Used or new Electronic Equipment (including components and derived materials) which are:

- e. Destined, or are intended to be destined, all or in part (e.g. components removed during Repair/Refurbishment) for Materials Recovery, Recycling, energy recovery, or Final Disposal,
- f. Destined, or are intended to be destined, for Repair/Refurbishment or reuse but either are untested for Full Functionality or, if tested, found not to be Fully Functional,
- g. Tested and Fully Functional, but for which a legal and legitimate reuse market has not been affirmed, and/or
- h. Considered waste by the country of import, transit, or export.

### 3.33 End Processor

The final Downstream Processor at the end of the Recycling Chain that transforms a mixed, waste, or scrap material into products or into Commodities that will be used again to produce new products with no further refinement or separation of materials or wastes. End Processors may produce residual by-products, such as slag and filter cake, or treated wastes for further Recycling or Final Disposal. End Processors include smelters, and mercury retort, plastics recovery, and glass-to-glass furnace operations.

### 3.34 End Refurbisher

A certified e-Stewards Organization or their Immediate Downstream Processor(s) that completes the e-Stewards requirements for reuse, as defined in this Standard.

### 3.35 e-Stewards Organization – see definition for Organization below

### 3.36 Essential Function(s)

Product features which a user of an electronic product (equipment or component) can reasonably expect to be present based on the original or upgraded design and marketed description of the Electronic Equipment, and features without which safe or effective use would be unlikely. If equipment or components have been Repurposed, Essential Functions must include all features needed to perform for the actual consumer of the Repurposed device, in accordance with the definition of Repurposing.



### 3.37 Final Disposal

Operations which do not lead to the possibility of Materials Recovery, Recycling, reclamation, Direct Reuse, or alternative uses (i.e. Basel Annex IV Part A). It includes deposit in landfills and/or incinerators (including incinerators with energy recovery), and safe, monitored, retrievable storage.

### 3.38 Final Disposition

The last facility or operation in the e-Stewards Recycling Chain at which an e-Waste either:

- a. Ceases to be a waste by being Processed into a Commodity,
- b. Is prepared for Direct Reuse by completing reuse requirements in this Standard, and/or
- c. Has arrived at Final Disposal and is finally disposed.

These end points in the Recycling Chain can include Final Disposal facilities (e.g. landfills and incinerators), End Processors (e.g. smelters making Commodity metals), End Refurbishers, and in the case of cleaned CRT cullet, a glass furnace operation, if all requirements have been met.

### 3.39 Fully Functional/Full Functionality

Electronic Equipment and/or components that have been effectively tested and demonstrated to:

- a. Meet or exceed the original functionality specifications for the product/component's Essential Functions, or if upgraded or Repurposed, the intended new specifications for these products,
- b. Be safe for use and handling, without electrical, physical, or fire hazards, and not have structural problems (such as cracked casings, screens, or wire sheathing) which could lead to damage or lack of functionality, and
- c. Not contain any non-functional Hazardous Electronic Equipment, such as non-working circuit boards, mercury-containing devices, batteries, or CRTs.

### 3.40 Halogenated Materials

Contain compounds with atoms of the halogen group of elements including fluorine, chlorine, bromine and iodine. In Electronic Equipment, these materials include all plastics, circuit boards, and other items which contain brominated flame retardants (BFRs), polyvinyl chloride (PVC), and components containing polychlorinated biphenyls (PCBs).

### 3.41 Hazardous Electronic Equipment (HEE)

Electronic Equipment, components, and materials (processed, unprocessed, and residuals) for which the constituents or hazardous characteristics are unknown, or that consist of, contain, or are derived from:

- a. Asbestos, except unintentional inputs,
- b. Batteries:
  - ▶ Of any kind containing intentional inputs of lead, mercury, and/or cadmium,
  - ▶ Unsorted batteries or batteries of which the contents are unknown,
  - ▶ Batteries containing flammable organic solvents, e.g. lithium ion batteries & battery packs,
  - ▶ Batteries containing any other hazardous materials listed in the Basel Convention Annex I and possessing an Annex III hazardous characteristic,



- c. Cathode ray tubes (CRTs); CRT glass (including mixed glass); CRT cullet; CRT fines, Phosphors, coatings, and frit from CRT glass; and any materials contaminated with these,

NOTE: The following are exempt from the definition of HEE:

1. CRT glass that is non-leaded and is thoroughly cleaned of Phosphors, coatings, frit, and fines<sup>7</sup>, as determined by a toxics characteristic leaching procedure (TCLP) or equivalent method, and
2. The metal band around the CRT front panel, and/or the shadow mask, unless they are contaminated with Phosphors or materials listed in the chart in d) below.

- d. Circuit boards<sup>8</sup>, lamps, switches, or any other parts, materials<sup>9</sup>, assemblies, housings, cables, and wires which contain any of the substances listed below in levels exceeding the indicated thresholds. In the absence of knowledge or information regarding the toxicity of Electronic Equipment, in any form, it shall be presumed to be Hazardous Electronic Equipment, unless it can be demonstrated via the US EPA's TCLP Method 1311<sup>10</sup> that the material does not exceed threshold limits in the chart below:

TCLP Limits for 3.42 d)			
The following limits are for concentrations of one or more elements (present elementally or found in a compound form):			
▶ Arsenic (unintentional inputs)	▶ 5.0 mg/L	▶ Chromium	▶ 5.0 mg/L
▶ Barium	▶ 100 mg/L	▶ Lead	▶ 5.0 mg/L
▶ Beryllium	▶ 0.007 mg/L	▶ Mercury (unintentional inputs)	▶ 0.2 mg/L
▶ Cadmium	▶ 1.0 mg/L	▶ Selenium (unintentional inputs)	▶ 1.0 mg/L
NOTE: The above levels are to apply to separated components, such as separated circuit boards, separated lamps, switches, plastics, structural metal, or to separated Processing residuals (e.g. shredded circuit boards, or CRT fines), and not to the whole device/equipment they are found in. For example, when testing for beryllium, one should test the circuitry/component where copper beryllium alloy is expected to be found and not the entire computer.			
NOTE: Hazardous Electronic Equipment does not refer to non-hazardous materials such as copper, aluminum, or steel alloys (waste streams listed in the Basel Convention Annex IX), unless that material is contaminated with materials listed in a) – i), or otherwise exceeds the threshold test levels in this chart.			

- e. Mercury: Circuit boards, lamps, switches, LCD displays, and other parts, components or assemblies containing intentional inputs of mercury,
- f. Polychlorinated biphenyls (PCBs) with levels that exceed actual concentrations >50 mg/kg,
- g. Radioactive waste: All components/materials containing or contaminated by radio-nuclides, the concentrations or properties of which result from human activity,
- h. Selenium & arsenic: Components and/or devices containing intentional inputs of selenium and/or arsenic and their compounds, including printer or copy drums, and LEDs with gallium arsenide, and

<sup>7</sup> e.g. some, but not all, cleaned front panel CRT glass.

<sup>8</sup> For the purposes of practicality, it can be presumed that all circuit boards will fail these levels and should be presumed to be Hazardous Electronic Equipment due to common constituents such as lead and beryllium, unless they are tested and demonstrated to fall below limits in this TCLP table.

<sup>9</sup> NOTE: This may include shredded plastics contaminated with lead and other toxics, to the extent they fail the cited TCLP.

<sup>10</sup> <http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/1311.pdf> This is a sample extraction method for chemical analysis employed as an analytical method to simulate leaching through a landfill, defined in US law in 40 CFR Part 261, Appendix II, EPA Method 1311. This is a defined procedure that can be followed by any qualified laboratory, and will serve as a standard procedure until there is a universally accepted TCLP incorporated into this Standard. The TCLP levels are drawn from US Federal Register (40CFR 266 Appendix VII).



- i. Any other materials deemed hazardous waste by the Organization's national government or other countries involved in transboundary trade.

### 3.42 Hazardous Electronic Waste<sup>11</sup> or Hazardous e-Waste (HEW)

Includes new or used:

- a. Hazardous Electronic Equipment (HEE) that is destined, or is intended to be destined for:
  - ▶ Recycling, energy recovery, or Final Disposal, all or in part, including shredded material, components, residues, and parts removed during Repair/Refurbishment, and/or
  - ▶ Repair/Refurbishment or reuse, but not Direct Reuse, and
- b. Electronic Equipment (including components) that is:
  - ▶ Tested and Fully Functional but for which a Direct Reuse market has not been affirmed according to requirements in 4.4.6.2 (Reuse), and/or
  - ▶ Deemed hazardous waste or banned for importation by the country of import or transit, regardless of type of destination or condition of equipment.

### 3.43 Immediate Downstream Processor

A next-tier<sup>12</sup> facility to which the e-Stewards Organization transfers (with or without Intermediaries involved) Hazardous Electronic Equipment, Hazardous e-Waste, or Problematic Components and Materials in any form. An Immediate Downstream Processor can include End Refurbishers, Downstream Processors, End Processors, and Final Disposal facilities, but does not include Intermediaries such as Brokers.

### 3.44 Industrial Hygiene

The anticipation, recognition, evaluation, communication, and control of environmental stressors in, or arising from, the workplace that may result in injury, illness, impairment, or affect the well being of workers and/or members of the community.

### 3.45 Intermediary

Any entity within the Recycling Chain which Brokers, holds, buys, sells, transfers, stores, manages, or facilitates transactions of any e-Waste (including material derived from it) that passes through the Organization's facility or Control, but does not Recycle. Intermediaries include, but are not limited to, Brokers, independent representatives, agents, logistics and cross-docking firms, and freight forwarders. The term Intermediary does not include Downstream Processors.

### 3.46 Materials Recovery

Operations that are part of a Process to recapture elements, compounds, or materials and transform them into Commodities.

<sup>11</sup> The term 'Hazardous Electronic Waste' as used in this Standard is not meant to pertain to, nor is synonymous with any current legal national, provincial/state, or local definitions of 'hazardous waste'. In addition, this definition interprets the Basel Convention definitions of hazardous waste as they apply to electronic waste in particular, resulting in a precautionary and pragmatic definition for use in this Standard.

<sup>12</sup> i.e. with no other entities Processing or Recycling the material between the e-Stewards Organization and the subsequent vendor.



### 3.47 Occupational Environmental Health and Safety Professional

A professional or a combination of professionals<sup>13</sup> with qualifications and competencies in environmental and occupational health and safety aspects of an Organization's operations, who have all of the following qualifications and competencies in the areas in which they provide services for the Organization:

- a. Have successfully completed environmental and occupational health and safety professional development training courses, and update credentials as required, and
- b. Can demonstrate knowledge of the electronics recycling industry's hazards, Industrial Hygiene solutions, and environmental risks, in particular those of the operations and facility(s) they serve, through competent risk assessments, records, and auditor interviews, and
- c. Either:
  - ▶ Possess a current certification in environmental and occupational health & safety from a nationally or internationally recognized environmental and occupational health & safety certifying agency; or
  - ▶ Have spent at least 7 years as a full time (at least 75% of their job duties) trained environmental and occupational safety and health professional with experience pertinent to the work they will perform for the Organization; or
  - ▶ Have a minimum of the equivalent of 2 years of full time experience and training specific to the electronics recycling industry as an environmental and occupational health and safety professional.

### 3.48 Organization / e-Stewards Organization (see also definition 3.16 Organization)

An eligible entity which is either a candidate for certification to the e-Stewards Standard, or is currently registered as a certified e-Stewards recycler. An Organization includes all assets, property, and operations of the entity, including Ancillary Sites.

NOTE: See 1.1.4 and 1.1.5 above for requirements for eligibility and certifying multiple Recycling facilities with the same ownership in one country.

### 3.49 Phosphors

Metal compounds which produce light when excited (i.e., are struck by a free electron). Phosphors coat the inside of face plates/front panels of cathode ray tubes (CRTs) (typically a powdery white coating), and are also used in some lamps, such as fluorescent lamps utilizing mercury-based phosphors. Phosphors in the current waste stream are likely to contain compounds of cadmium, mercury, and/or other metals of varying or unknown toxicity or value.

### 3.50 Potentially Hazardous Processing Technologies (PHPTs)

Technologies, activities, or operations which Process Hazardous Electronic Equipment and/or Problematic Components or Materials, including:

- a. Shredding, cutting, grinding, crushing, breaking, baling, pulverizing, fragmenting, cracking, and/or chipping, or any other activities which create dust, particulates, or vapors,

<sup>13</sup> For example, physicians experienced in occupational and environmental medicine and medical toxicology, certified industrial hygienists, certified safety specialists, and ergonomists.



NOTE: The following are not considered a Potentially Hazardous Processing Technology:

- ▶ A hard drive punch/drill
  - ▶ Shredding of separated magnetic storage hard drives, if the circuit boards are manually removed prior to shredding the hard drives. (This exemption does not extend to solid state drives, hybrid drives, or any newer technology which may have imbedded circuit boards.)
  - ▶ Careful, slow and controlled release of the vacuum in a cathode ray tube (CRT) that is otherwise intact
- b. Opening, dismantling, or repairing mercury-containing devices, such as LCD displays or mercury switches, including manual removal of mercury-containing lamps,
- c. Thermal or chemical Processes of any kind, including but not limited to smelting, refining, melting, dissolving, reacting, and burning.<sup>14</sup>

### 3.51 Problematic Components or Materials (PCMs)

e-Wastes which may not be defined as Basel Convention hazardous wastes or e-Stewards Hazardous Electronic Wastes, but which may be hazardous or require special controls or attention in this Standard due to desired recyclability or potential environmental or occupational health and safety risks that may arise from Recycling such components or materials. These include:

- a. Sorted alkaline and other non-hazardous batteries, which contain no lead, mercury, cadmium, lithium, flammable organic solvents, or unknown contents,
- b. Glycolant coolants,
- c. Inks and toners, and their uncleaned cartridges and containers,
- d. Plastics with Halogenated Materials, such as polyvinyl chloride (PVC) and those containing brominated flame retardants, and
- e. Other components and materials identified by the Organization as problematic.

### 3.52 Recycling/Processing

As an alternative to Final Disposal, the physical alteration, manipulation, or management of Electronic Equipment (hardware and software) for the purposes of reuse and/or Materials Recovery. It includes, but is not limited to, manually dismantling, mechanically reducing size, repairing, remanufacturing, Repurposing, refining, End Processing, and harvesting parts from Electronic Equipment. It also includes software manipulation such as data sanitization and software installation, upgrading, and testing. Final Disposal and energy recovery are not Recycling.

### 3.53 Recycling Chain

All entities, activities, and operations beginning with the initial e-Stewards Organization and including any of its downstream vendors that manage, receive, transfer, storage, Broker, Process, Repair/Refurbish, Recycle and/or finally dispose of Electronic Equipment that passes through an e-Stewards Organization's facility or Control, through but not beyond Final Disposition. The Recycling Chain includes, but is not limited to, all Ancillary Sites, Downstream Processors, End Refurbishers, Intermediaries, End Processors, Brokers, and Final Disposal facilities that manage any Electronic Equipment from the Organization or under its Control.

<sup>14</sup> This does not include the incidental use of cleaning chemicals including solvents, or hand-held solder guns, if proper precautions are used to prevent exposure to toxic or irritant fumes.





NOTE: The end of the Recycling Chain for cleaned CRT glass, but not its residuals, destined for use as a feedstock in the manufacture of new products is at the facility manufacturing new products using the CRT glass.

#### 3.54 Repair/Refurbish(ment), or Repairing/Refurbishing

The process and activities required to transform used or unused Electronic Equipment (including components) into Fully Functional Electronic Equipment for Direct Reuse rather than for Materials Recovery or Final Disposal. Such activities may include cleaning, data sanitization, software and hardware changes or upgrading, fixing hardware faults, replacing or removing faulty or unwanted components, remanufacturing, removal of identifying labels/stickers, and/or Repurposing. Repair/Refurbishment activities usually result in some e-Waste (e.g. non-functional parts or devices) that will be destined for Recycling or Final Disposal.

#### 3.55 Repurposing

A form of reuse that relies on the primary data processing function of Electronic Equipment, (except photo voltaic modules), but utilizes that function for a purpose or context other than originally intended, e.g. combining CPUs or motherboards for use as a network server.

#### 3.56 Shipping Records

Verifiable records of incoming and outgoing shipments or transfers of Electronic Equipment (including components and materials derived from equipment), including shipping logs, invoices, bills of lading/waybills, other commercially-accepted documentation of transfers, and the corresponding acknowledgements of receipt from receiving facilities. Such records should contain weights of materials and/or piece/unit counts, date, consignee and consignor, and verifiable contact information for entity that transfers shipment.



## 4 Environmental management system requirements

### 4.1 General requirements

*The Organization shall establish, document, implement, maintain and continually improve an Environmental Management System in accordance with the requirements of this International Standard and determine how it will fulfill these requirements.*

*The Organization shall define and document the scope of its Environmental Management System. An Organization's Environmental Management System shall:*

- a) Include occupational health and safety, data security, and social accountability management system(s), and other requirements specified in this e-Stewards Standard, and
- b) Apply to:
  1. The Electronic Equipment, property and assets under the Organization's ownership and/or Control, and
  2. Workers, including temporary, part time, and contract workers, volunteers, and interns.

### 4.2 Environmental policy

*Top management shall define the Organization's environmental policy and ensure that, within the defined scope of its Environmental Management System, it:*

- a) *is appropriate to the nature, scale and environmental impacts, and occupational health and safety, social accountability, and data security risks of its activities, products and services,*
- b) *includes a commitment to continual improvement and prevention of pollution, injury, and illness, as well as a commitment to:*
  1. Prevention of exports of Hazardous Electronic Waste (HEWs) throughout the Recycling Chain which violate international laws, treaties, and agreements,
  2. Prohibition of forced or child labor throughout the Recycling Chain,
  3. Prohibition of prison operations throughout the Recycling Chain that involve incarcerated individuals handling HEWs or Customer Data, and:
    - ▶ Are subsidized by government (directly or indirectly),
    - ▶ Involve the likelihood of risks of release or misuse of Customer Data, or
    - ▶ Do not provide workers with the same rights as private sector workers to protections from exposure to toxics, and
  4. Social accountability values within its Organization consistent with the principles of SA 8000 (certification to SA 8000 is encouraged but not required),
- c) *includes a commitment to comply with applicable legal requirements and with other requirements to which the Organization subscribes which relate to its Environmental and Stewardship Aspects,*
- d) *provides the framework for setting and reviewing environmental, occupational health and safety, and data security objectives and targets,*
- e) *is documented, implemented and maintained,*



- f) *is communicated to all persons working for or on behalf of the Organization,*
- g) *is available to the public, and*
- h) *encourages all Downstream Processors to operate consistent with the principles of SA 8000.*

## 4.3 Planning

### 4.3.1 Environmental and Stewardship Aspects

*The Organization shall establish, implement and maintain a procedure(s)*

- a) *to identify the Environmental and Stewardship Aspects of its activities, products and services, including those that arise from the requirements of this Standard, within the defined scope of the Environmental Management System that it can control and those that it can influence taking into account planned or new developments, or new or modified activities, products and services, and*
- b) *to determine those Environmental and Stewardship Aspects that have or can have significant impact(s) on the environment (i.e., significant Environmental and Stewardship Aspects), the health and safety of those impacted by the operations<sup>15</sup>, and the data privacy of customers,*
- c) **Conduct a risk assessment**

At least every three years, conduct and document a risk assessment of the Organization's Environmental and Stewardship Aspects associated with all forms of Electronic Equipment and its management. The health and safety portion of the assessment shall be conducted by an Occupational Environmental Health and Safety Professional(s). The assessment may require a multidisciplinary team to address all potential hazards. Additional risk assessments shall be conducted on specific operations or areas prior to and following any significant changes.

The risk assessments shall take into account the Organization's Environmental and Stewardship Impacts and the results of monitoring activities (4.5.1), and shall give consideration to:

1. Customer Data privacy, downstream risks associated with Hazardous e-Waste and hazardous waste management, releases to the environment such as storm water runoff and air emissions, and transportation,
2. Physical hazards, including noise (impact, continuous, and intermittent), ergonomic hazards, vibration, lighting, and temperature extremes,
3. Chemical hazards in the form of vapors, dust, fumes, or radioactivity, whether from the hazardous substances present in Electronic Equipment or processes used to manage it, both in operational areas and in areas where hazards may migrate (e.g. offices, changing rooms, dining and break rooms). Examples of chemical hazards include, but are not limited to lead, mercury, cadmium, Phosphors, beryllium, and brominated flame retardants,
4. Biological hazards, e.g., blood that is present in used glucometers, or microorganisms in medical Electronic Waste,
5. The following practices, in order to decrease worker exposure and take home contamination (potentially exposing others outside the workplace):

<sup>15</sup> This includes workers, temporary workers, supervisors, consultants, auditors, volunteers, any others performing work for the Organization, as well as the surrounding community.



- ▶ Housekeeping practices in the workplace (disallowing practices such as dry sweeping dust, and using compressed air to clean surfaces),
  - ▶ Work practices of individual workers, and
  - ▶ Personal hygiene practices, e.g. washing or showering adequately for removal of contamination prior to eating, taking a break, and/or leaving the work area,
6. Trends or continued risks as documented in records of past injuries, accidents, and workplace monitoring records in order to determine if earlier risks have been adequately addressed and reduced, and
7. Other hazards including hazardous substances that may be present in the Electronic Equipment, non-conforming (unusual incoming) materials, and in other products or processes used in operations (such as solvents, cleansers, and solder guns), and
- d) Identify and prioritize significant Environmental and Stewardship Aspects

The Organization shall identify, determine significance of, and prioritize its Environmental and Stewardship Aspects, taking into account their associated severity and frequency, the results of the risk assessment(s), stakeholder concerns, legal and other requirements (4.3.2), and environmental, health and safety monitoring results (4.5.1). *The Organization shall document this information and keep it up to date.*

*The Organization shall ensure that the significant Environmental and Stewardship Aspects and other risks and obligations that arise from the requirements of this Standard are taken into account in establishing, implementing and maintaining its Environmental Management System.*

#### 4.3.2 Legal and other requirements

*The Organization shall establish, implement and maintain a procedure(s)*

- a) *to identify and have access to the applicable legal requirements and other requirements to which the Organization subscribes related to its Environmental and Stewardship Aspects, contractual agreements, and each policy commitment (4.2),*
- b) *to determine how these requirements apply to its Environmental and Stewardship Aspects,*
- c) *to identify, obtain, and maintain all required national, state/provincial and local permits covering specific operations, limitations, and controls, and*
- d) *to implement all local, state/provincial, and national requirements for environment, social accountability, occupational health and safety, and data security.*

*The Organization shall ensure that these applicable legal requirements and other requirements to which the Organization subscribes are taken into account in establishing, implementing and maintaining its Environmental Management System.*

##### 4.3.2.1 Legal Export, Transit, and Import Requirements

An Organization shall ensure legal transboundary movement (export, transit, and import) of used Electronic Equipment destined for reuse and of each Hazardous e-Waste (and of some Problematic Compounds or Materials as noted in 4.4.6.7), coming into their facility(s), under their Control, and throughout their Recycling Chain, by identifying and ensuring consistency with all relevant legal and other requirements, including:



- a) The requirements of:
1. The Organization for Economic Cooperation and Development (OECD),
  2. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal,
  3. The Basel Convention Decision III/1, also known as the Basel Ban Amendment, regardless of whether or not it is in legal force nationally or internationally,
  4. Other applicable international laws regarding trade (export, transit, or import) in hazardous wastes, including regional treaties and accords (e.g. the Waigani Treaty, Bamako Convention, Izmir Protocol, Central American Accord, EU Waste Shipment Regulation), and
  5. National legislation of any countries concerned (export, transit, and import), including laws pertaining to tested and Fully Functional used equipment, and restrictions on older equipment, and
- b) Ensuring that each shipment of Hazardous e-Waste is exported or imported only as follows:
1. Implementation of Basel Ban Amendment [a) 3 above]: When exported from OECD/EU countries and Liechtenstein, shipments shall only go to and through countries in that same group, and the trade is for Recycling and not Final Disposal,
  2. Implementation of trade ban between Basel Parties and non-Parties<sup>16</sup>: All countries concerned (export, transit, and import) must be Parties to the Basel Convention, unless at least one of them is a Basel Party and all countries concerned have concluded a valid special bilateral or multi-lateral agreement as allowed under Article 11 of the Basel Convention, and
  3. Implementation of the Basel Convention, regional agreements, and national laws: If trade (export, transit, and import) is not prohibited under 1 and 2 above<sup>17</sup>, it shall be conducted only in full conformity with all applicable legal and other requirements including national and regional agreement requirements, as well as with the requirements of the Basel Convention. These requirements include contacting government Competent Authorities<sup>18</sup> and obtaining national government-to-government written approval from the exporting, transiting, and importing countries prior to the export of each shipment<sup>19</sup>. The Basel Convention also requires recognition of national definitions of hazardous waste for any country concerned (export, transit, and import) as submitted to the Basel Convention Secretariat.

#### 4.3.3 Objectives, targets and programme(s)

*The Organization shall establish, implement and maintain documented environmental, health and safety, and data security objectives and targets, at relevant functions and levels within the Organization.*

*The objectives and targets shall be measurable, where practicable, and consistent with the environmental policy, including the commitments to prevention of pollution, worker injury and ill health, and unauthorized access to or release of Customer Data, to compliance with applicable legal requirements and with other requirements to which the Organization subscribes, and to continual improvement.*

<sup>16</sup> Basel Convention, Article 4, Paragraph 5; [www.basel.int](http://www.basel.int) (NOTE: USA is not a Basel Party as of date of publication of this Standard.)

<sup>17</sup> e.g., for trade between two non-OECD and non-Basel Parties

<sup>18</sup> For a list of Competent Authorities of Basel Parties, and their contact information, see: <http://www.basel.int/Countries/CountryContacts/tabid/1342/Default.aspx>

<sup>19</sup> The Basel Convention, OECD and other agreements may allow a country to provide "general consent" for periods of time, based on a number of conditions.



*When establishing and reviewing its objectives and targets, an Organization shall take into account the legal requirements and other requirements to which the Organization subscribes, and its significant Environmental and Stewardship Aspects, including those associated with the requirements of this Standard. It shall also consider its technological options, its financial, operational and business requirements, and the views of interested parties.*

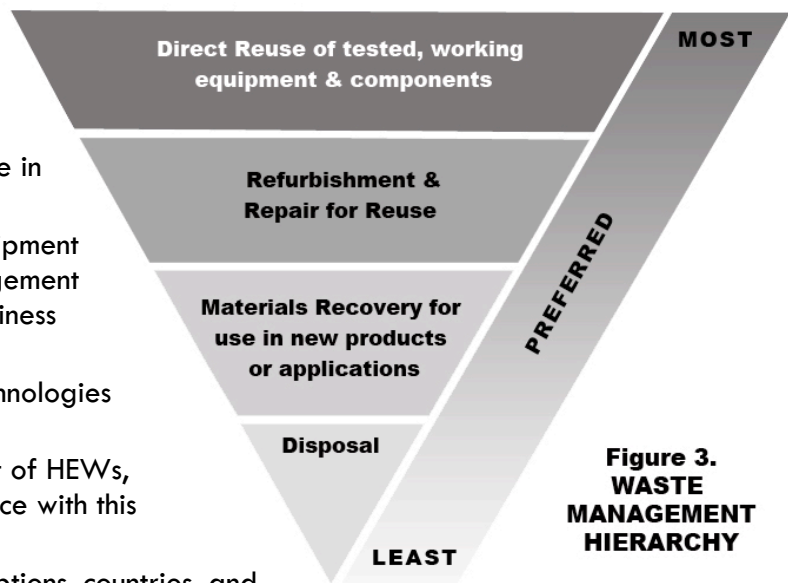
*The organization shall establish, implement and maintain a programme(s) for achieving its objectives and targets. Programme(s) shall include:*

- a) *designation of responsibility for achieving objectives and targets at relevant functions and levels of the Organization, and*
- b) *the means and time-frame by which they are to be achieved.*

#### 4.3.4 Planning for responsible management & disposition of Electronic Equipment

The Organization shall document and implement a plan for the responsible management and disposition of Electronic Equipment received by the e-Stewards Organization or under their Control in a manner that protects human health and the environment, and is in conformity with this Standard. The plan shall identify:

- ▶ Electronic Equipment that is accepted, items that are not accepted, and how to manage unusual materials if received,
- ▶ The hazardous substances that may be in Electronic Equipment, including HEWs,
- ▶ Priorities for managing Electronic Equipment based on the Figure 3. Waste Management Hierarchy, and as appropriate to business model and customer requirements,
- ▶ Potentially Hazardous Processing Technologies employed,
- ▶ Operational controls for management of HEWs, PCMs, and their residuals in accordance with this Standard, and
- ▶ Acceptable downstream Processing options, countries, and Final Disposition for HEWs, PCMs, and residuals.



**Figure 3.  
WASTE  
MANAGEMENT  
HIERARCHY**

#### 4.4 Implementation and operation

##### 4.4.1 Resources, roles, responsibility and authority

*Management shall ensure the availability of resources essential to establish, implement, maintain and improve the Environmental Management System. Resources include human resources and specialized skills, Organizational infrastructure, technology and financial resources.*

*Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management and management of hazards, risks, and obligations, including those associated with the requirements of this Standard.*

*The Organization's top management shall appoint a specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for:*



- a) *ensuring that an Environmental Management System is established, implemented and maintained in accordance with the requirements of this International Standard and the e-Stewards Standard,*
- b) *reporting to top management on the performance of the Environmental Management System for review, including recommendations for improvement.*

#### 4.4.2 Competence, training and awareness

*The Organization shall ensure that any person(s) performing tasks for it or on its behalf that have the potential to cause a significant environmental, occupational health and safety, or data security impact(s) identified by the Organization and who is (are) responsible for implementing the requirements of this Standard, is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.*

*The Organization shall identify training needs associated with its Environmental and Stewardship Aspects, export and other e-Stewards requirements, and its Environmental Management System. It shall provide training or take other action to meet these needs, and shall retain associated records.*

*The Organization shall establish, implement and maintain a procedure(s) to make persons working for it or on its behalf aware of:*

- a) *the importance of conformity with the environmental, occupational health and safety, and data security policy and procedures and with the requirements of the Environmental Management System,*
- b) *the significant Environmental and Stewardship Aspects, and related actual or potential impacts associated with their work, and the environmental, health and safety, and data privacy benefits of improved personal performance,*
- c) *their roles and responsibilities in achieving conformity with the requirements of the Environmental Management System,*
- d) *the potential consequences of departure from specified procedures, commitments and procedures to implement this Standard, and*
- e) *Potential risks and controls arising from the introduction of new Processes and/or new materials.*

#### 4.4.3 Communication

*With regard to its Environmental and Stewardship Aspects and management system the Organization shall establish, implement and maintain a procedure(s) for*

- a) *internal communication among the various levels and functions of the Organization,*
- b) *receiving, documenting and responding to relevant communication from external interested parties,*
- c) *Ensuring that all training and other communications to workers are made in a language and format understandable by the workers (e.g. tailored to literacy levels), and*
- d) *Reporting emergency events and exceptional releases of toxics or other hazards to appropriate authorities.*

*The Organization shall decide whether to communicate externally about its significant Environmental and Stewardship Aspects, and shall document its decision. If the decision is to communicate, the Organization shall establish and implement a method(s) for this external communication.*



#### 4.4.3.1 Participation and Communication

The Organization shall establish and maintain a participation and communication program:

a) For workers

The Organization shall communicate with workers regarding the Environmental Management System, including but not limited to:

1. Conduct and document regularly scheduled safety and health meetings,
2. Ensure workers and contractors are consulted and informed regarding issues and changes that may affect their occupational health and safety,
3. Communicate environmental, health and safety information, as allowable by law, including:
  - ▶ Industrial Hygiene monitoring results for each affected work position, without identifying any affected workers, as well as communicating a clear explanation of what the results mean, and
  - ▶ Timely and confidential communication of Industrial Hygiene and medical monitoring results with each affected worker with clear interpretation of these results, including whether or not workers have been exposed to levels at which the Organization is required by law or this Standard to mitigate,
4. Establish and maintain an ongoing occupational and environmental health and safety team in order to ensure regular communication between and participation of representatives of all levels of workers and management regarding environmental, health, safety, and social accountability issues, which:
  - ▶ Facilitates two-way communication between workers and management, without fear of reprisal (e.g. via a system to accept anonymous tips or concerns),
  - ▶ Regularly reviews environment, health and safety suggestions, complaints, concerns, reports of safety violations, and exposure data,
  - ▶ Allows workers and supervisors to participate in hazard identification, risk assessments, and incident investigations,
  - ▶ Reviews effectiveness of controls, and makes recommendations to management review (4.6) meetings for improvements to system processes and operational controls,
  - ▶ Provides workers with the authority to discuss recommendations and implement actions for environmental protection, health and safety, and social accountability, and
  - ▶ Regularly reviews non-conformities and the effectiveness of closure (completion) of corrective and preventive actions (4.5.3),

b) For Customers

If requested by customers, including upstream e-Stewards Organizations, the Organization shall provide, or allow review of, verifiable records of:

1. Hazardous e-Waste going for Recycling or Final Disposal, including Hazardous e-Waste generated by Repair/Refurbishment operations. Records shall include current contact information for Downstream Processor(s) through Final Disposition, and





2. Equipment and components going for reuse, up to the point of completing requirements for reuse in conformity with 4.4.6.2. Records shall include dated sales orders or invoice numbers, but do not need to include names of buyers.

Should the customer require extensive detailed documentation, provision of such information may be contractually negotiated and controlled.

#### 4.4.4 Documentation

*The Environmental Management System documentation shall include:*

- a) *the environmental policy, objectives and targets,*
- b) *description of the scope of the Environmental Management System,*
- c) *description of the main elements of the Environmental Management System and their interaction, and reference to related documents,*
- d) *documents, including records, required by this International Standard and the e-Stewards Standard, and*
- e) *documents, including records, determined by the Organization to be necessary to ensure the effective planning, operation and control of processes that relate to its significant Environmental and Stewardship Aspects.*

#### 4.4.5 Control of documents

*Documents required by the Environmental Management System and by this International Standard shall be controlled. Records are a special type of document and shall be controlled in accordance with the requirements given in 4.5.4.*

*The Organization shall establish, implement and maintain a procedure(s) to*

- a) *approve documents for adequacy prior to issue,*
- b) *review and update as necessary and re-approve documents,*
- c) *ensure that changes and the current revision status of documents are identified,*
- d) *ensure that relevant versions of applicable documents are available at points of use,*
- e) *ensure that documents remain legible and readily identifiable,*
- f) *ensure that documents of external origin determined by the Organization to be necessary for the planning and operation of the Environmental Management System are identified and their distribution controlled, and*
- g) *prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.*

#### 4.4.6 Operational control

*The Organization shall identify and plan those operations that are associated with the identified significant Environmental and Stewardship Aspects consistent with its environmental policy, objectives and targets, in order to ensure that they are carried out under specified conditions, by*

- a) *establishing, implementing and maintaining a documented procedure(s) to control situations where their absence could lead to deviation from the environmental policy, objectives and targets,*
- b) *stipulating the operating criteria in the procedure(s),*



- c) *establishing, implementing and maintaining procedures related to the identified significant Environmental and Stewardship Aspects of goods and services used by the Organization and communicating applicable procedures and requirements to suppliers, including contractors, and*
- d) Establishing a regular schedule of facility environmental, health and safety inspections in order to ensure operational controls and housekeeping procedures are effectively implemented on an ongoing basis.

#### 4.4.6.1 Eliminate and mitigate significant Environmental and Stewardship Aspects

An Organization shall establish, implement, and maintain a documented program and procedures to address its Environmental and Stewardship Aspects, including an occupational health & safety and Industrial Hygiene program to:

- ▶ Protect workers from injury and illness,
- ▶ Reduce or eliminate workplace hazards and exposure to hazardous materials, and
- ▶ Protect workers' rights for health and safety.

This program shall include a precautionary approach, shall address priority hazards and respond quickly to emerging information about new concerns, and shall give preference to the following hierarchy of controls, in this order: elimination, substitution, engineering, administrative, and finally personal protective equipment. The ongoing occupational health and safety and Industrial Hygiene program shall include, but not be limited to, the following:

##### a) Airborne hazard controls

Based on the results of the risk assessment (4.3.1) and testing for each airborne hazard<sup>20</sup> (4.5.1.2), establish and maintain controls to mitigate exposures in the operational areas and to prevent migration of hazards outside the operational areas. This shall include controls according to the hierarchy of controls outlined above to maintain air quality and prevent releases, under the direction of competent personnel and effectively reduce or eliminate exposures, as required below.

The e-Stewards operational occupational exposure limit (OOEL) for each identified hazard shall be either the applicable regulatory limit in the jurisdiction of the Organization or the current Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists (ACGIH). In order to foster best practices, Organizations are encouraged to adopt the lowest, most protective limits. If there are not regulatory limits for any particular hazard in the country concerned, then only the ACGIH TLV shall apply.

In addition, the following controls shall be implemented:

1. If results are equal to or exceed 100% of the OOEL (described above) in the Organization's jurisdiction, urgently implement appropriate measures in accordance with the hierarchy of controls above. The Organization shall take timely action to protect workers when elimination, substitution, and/or engineering controls are not immediately feasible or effective in reducing exposures to acceptable levels,
2. If results exceed any regulatory action levels (i.e. levels at which mitigation is legally required prior to reaching legal exposure limits), then implement control measures in accordance with the hierarchy above to reduce and maintain worker exposures below the action levels, as soon as possible, and

<sup>20</sup> It is important to note that the lack of an occupational exposure limit for a substance does not imply that the substance is safe or not hazardous.



3. If there are no regulatory action levels (i.e. no requirements to mitigate prior to exceeding the legal exposure limits), and test results are equal to or above 50% of the OOEL, the Organization shall establish objectives (4.3.3) to address these airborne hazards as soon as possible,

b) Housekeeping

Establish and implement an ongoing housekeeping program for all areas to prevent or mitigate physical hazards (such as slips, trips and falls), and avoid or minimize secondary routes of exposure (such as ingestion or dermal absorption) to chemical and biological hazards. Non-operational areas shall be kept free of harmful substances that may migrate from operational areas and cause increased exposures and take home contaminants,

c) Ergonomic controls

An ergonomics program shall be established, documented, implemented, and re-evaluated at least every 3 years and when significant changes are made in work processes to address the risks identified in the ergonomic evaluation (4.3.1 c). If past injury reports and activities identify a strong likelihood that workers have suffered or will suffer musculoskeletal disorders, the Organization shall take further steps to prevent these,

d) Noise controls

A documented hearing conservation program shall be established, as needed, after comparing noise test results (4.5.1.2) to the most stringent regulatory exposure limits within the Organization's jurisdiction or if none, to those in an OECD country. The program shall:

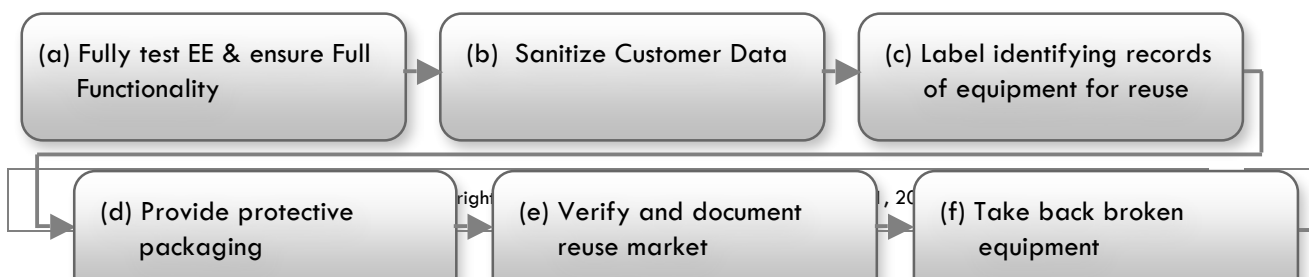
1. Evaluate and implement feasible engineering and administrative controls to reduce worker noise exposures in the event that noise levels are above either 85 decibels (time weighted average) or the applicable regulations or standard, whichever is more protective,
2. Ensure that hearing protective devices are worn by all affected workers while and until effective engineering and administrative controls are implemented, and retesting confirms effectiveness, and
3. Complete audiometric testing (gauging long term impacts) for all affected workers in the event that engineering/administrative controls take a year or longer to implement, and

e) Controls for significant Environmental and Stewardship Aspects

Establish, implement, and document formal procedures for significant Environmental and Stewardship Aspects, in order to mitigate and minimize environmental releases, worker and community exposures, take home contamination, data privacy risks, and have the necessary equipment and capacity on-site to implement these procedures.

#### 4.4.6.2 Reuse and Refurbishment of Electronic Equipment

The Organization shall ensure that Electronic Equipment that is donated, transferred, and/or sold for reuse, throughout Final Disposition, according to the following requirements (details below):





a) Fully test Electronic Equipment and ensure Full Functionality

The Organization shall determine that Electronic Equipment, including components, which contain or consist of HEEs and/or PCMs are Fully Functional, with exceptions defined in Table 1 below, by testing each item to determine its condition, Repairing/Refurbishing as needed, and ensuring they are Fully Functional prior to going for Direct Reuse.

In addition, the Organization shall:

1. Determine and document the state of health of each rechargeable battery<sup>21</sup> destined for reuse from mobile computing devices, including laptops, notebooks, e-readers, and touch-pads, as follows:
  - ▶ Recharge battery and ensure it will accept a charge, and
  - ▶ Test each battery that will accept a charge (whether it is part of a device or separate), and allow such batteries to go into reuse if:
    - ▶ The full charge capacity on the 'smart chip'<sup>22</sup> displays a value of 80% or greater than the original rated capacity<sup>23</sup> of the battery, or
    - ▶ Each recharged battery maintains a run time<sup>24</sup> of at least one hour during 'load testing'<sup>25</sup> at 60% of the battery's original load rating<sup>26</sup> or a mathematically equivalent load test protocol,
2. Determine the state of health of each mobile phone battery destined for reuse<sup>27</sup>, ensuring that it is capable of holding a charge of at least 80%<sup>28</sup> of its original rated capacity<sup>29</sup>. This should be accomplished by the following:
  - ▶ Recharge each battery (at least 30% recharged) and then perform a 'quick test' (e.g. with a quick sort analyzer) if a reliable quick test<sup>30</sup> is available for battery type, or

<sup>21</sup> This does not include rechargeable batteries in small wireless peripherals, such as wireless track pads, mice and keyboards.

<sup>22</sup> While there is no single definition for 'smart chip', integrated circuit chips standardized in 1993 contain smart battery systems designed to indicate 'state of charge', and provide both permanent and temporary data. Battery manufacturers program the permanent data into the battery, which includes battery identification, type, manufacturer's name, serial number and date of manufacture. The temporary data is regularly added to during battery use and consists of cycle count, user pattern, and maintenance requirements. It is not permissible for an Organization to reset the value on the smart chip.

<sup>23</sup> Battery capacity is a measure (typically in Amp per hour) of the charge that can be stored by the battery in its present condition. There are various testing protocols for determining the capacity of a battery and its state of health. Battery manufacturers typically state the rated capacity of new batteries on the battery labels, in terms of milli Amps per hour (mAmps).

<sup>24</sup> The time for the battery to fully drain is recorded, with at least 1 hour run time available from the battery (when not plugged into electrical grid).

<sup>25</sup> 'Load testing' refers to the actual usage or electrical demand placed on an electronic device (such as a laptop) during the battery test. All of the following can affect the 'load' (energy demand) on a device, while in use: screen brightness, type of programs, type of activity, temperature, and wireless features.

<sup>26</sup> i.e. 60% in milli Amps (mAmps) of the original milli Amp Hours (mAh) rating of the battery. For example, for a battery rated at 4,000 mAh, the required load would be 2,400 mAmps (60% of its original [new] rated output) with one hour run time before the electronic device shuts down.

<sup>27</sup> Unless mobile phone is Repurposed to a use that does not rely on the battery.

<sup>28</sup> This parameter was defined by participants in the United Nation's Mobile Phone Partnership Initiative (MPPI), including industry participants; <http://www.basel.int/industry/mppi.html>

<sup>29</sup> See footnote 23



- ▶ Fully charge and discharge the battery to measure its current capacity,
3. Determine that photo voltaic modules destined for reuse are capable of producing power output that is at least 50% of original power output, and
  4. Test CRT devices that are destined for remanufacturing<sup>31</sup> as follows:
    - ▶ Test each cathode ray tube for viability<sup>32</sup> and ensure only reusable tubes are transferred for remanufacturing, and
    - ▶ Do not allow other components that consist of or contain HEE (such as circuit boards) to be transferred to remanufacturing operations if those materials will be Recycled or disposed of, or if they are destined for reuse and have not met the requirements in this section 4.4.6.2.

**Table 1: Electronic Equipment that does not have to be tested for Full Functionality (4.4.6.2 a), if it meets these requirements**

Type of Electronic Equipment exempt from Full Functionality requirements (4.4.6.2 a)	Requirements for this type of Electronic Equipment, prior to going for reuse
1. New equipment or components still in unopened original packaging	The Organization shall determine that the devices are not known or suspected to be defective nor the subject of a product recall, and demonstrate the Organization has clear title and authority to sell such products.
2. New components (parts) in their original packaging which has been opened in order to remove some but not all of the new components	The Organization shall determine that the devices are not known or suspected to be defective nor the subject of a product recall, and demonstrate the Organization has clear title and the authority to sell such products. In addition, this exemption is only for components/packaging for which it can be demonstrated that the components are brand new, even if packaging has been opened.

<sup>30</sup> If using a pass/fail analyzer, it must be set at a minimum threshold of 80% for all batteries indicated to “pass” the quick test.

<sup>31</sup> e.g. removing a cathode ray tube (CRT) from a used device and building a new device/product incorporating the old tube.

<sup>32</sup> E.g., using a CRT picture tester/restorer.



Type of Electronic Equipment exempt from Full Functionality requirements (4.4.6.2 a)	Requirements for this type of Electronic Equipment, prior to going for reuse
<p>3. Used Electronic Equipment which is very unusual<sup>33</sup> and the total Annual sales/value of which equals 5% or less of the Organization's total Annual sales and/or value of donations.</p>	<p>The Organization, <u>but not their End Refurbisher(s)</u>, may sell and/or donate up to this limited quantity of unusual items without ensuring Full Functionality, if they complete all of the following:</p> <ul style="list-style-type: none"> <li>▶ Establish &amp; implement documented procedures for meeting the requirements of this exemption, including restrictions on quantities, clear criteria for identification of limited types of Electronic Equipment, as defined, and accepting returns,</li> <li>▶ Ensure all such Electronic Equipment is only exported, directly or indirectly, in conformity with section 4.3.2.1 (Legal Exports),</li> <li>▶ Prior to transfer of exempted Electronic Equipment, perform and document a thorough physical inspection of each unit and ensure the equipment/component is not damaged and appears to be in good working order or is repairable,</li> <li>▶ Clearly state on all advertising and invoices related to the sale or donation of each exempted item that it is:                         <ul style="list-style-type: none"> <li>▶ Not fully tested for functionality, and provide full disclosure of inspection results and condition,</li> <li>▶ For Repair/Refurbishment, and not Recycling or disposal,</li> <li>▶ Warranted for at least 90% money-back,</li> </ul> </li> <li>▶ Keep the following records:                         <ul style="list-style-type: none"> <li>▶ Unit and total value of Electronic Equipment donated and/or sold, and exempted in this subsection 3 of Table 1, and</li> <li>▶ Number or weight of units and/or parts returned.</li> </ul> </li> </ul>

b) Sanitize all Customer Data in conformity with 4.4.6.3 (Data Security),

c) Label or list identifying records for each item of Electronic Equipment

The Organization shall provide and maintain identifying information for each item of Electronic Equipment (including components) destined for reuse, except for integrated circuits and random access memory (RAM). The identifying information shall be conveyed via either a label attached to each item and/or a list of items in each lot or shipment, and shall be easily accessible to officials (e.g. customs officers) and customers without the need for unpacking. Identifying information shall include:

1. Type of device or component,
2. A unique identification number<sup>34</sup> of whole devices (and/or components if they are sold or donated separately and if they have identification numbers),
3. Year of production (if available) and model number (if available),
4. Manufacturer or brand name,

<sup>33</sup> i.e. Electronic Equipment which is not generally handled by the Organization and is very difficult to fully test due to the need for rare and highly specialized skills, specialized software or testing equipment, and/or rare and unavailable parts. Such unusual equipment may include obsolete (vintage), medical, manufacturing and testing equipment, but not equipment commonly available, or frequently managed by the Organization.

<sup>34</sup>The identification number can be a serial number affixed to a device or component by the manufacturer, or a similar unique number assigned to the specific device or component, distinguishing it from devices of similar make or model.



5. Type of testing performed on each device or separate component and, if applicable, data sanitization (see 4.4.6.3),
6. Result of tests performed, an accurate representation of the condition of the device or component (including cosmetic condition), a description of missing components (if applicable), confirmation that all equipment and/or components are Fully Functional (except for exempted equipment), and a clear representation that it is a used device or component (unless it is new and still in original packaging),
7. Information on rechargeable batteries for mobile computing devices, as follows [see Appendix A 4.4.6.7 b) for additional documentation required for exports]:
  - ▶ When a battery is shipped with the computing device it powers and is Fully Functional [4.4.6.2 a) 1], information for each battery indicating test results, i.e. that it has at least 80% of original capacity, and the battery shall be associated with the device,
  - ▶ If batteries destined for reuse are not shipped with the computing devices each battery will power (e.g. separated, bulk batteries), identifying information for each shipment shall include all the information in the bullet point above, as well as weight, count, and model number for each type of battery chemistry in a shipment,
8. Information on rechargeable batteries for mobile telecommunications devices indicating that each battery is Fully Functional [4.4.6.2 a) 2], i.e. has at least 80% of original capacity [see Appendix A 4.4.6.7 b) for additional documentation required for exports],
9. Name, address (including country), and current contact information of the Organization (and their End Refurbisher, if applicable) responsible for evidence and confirmation of Full Functionality, and
10. Product return policy,

d) Provide protective packaging

The Organization shall package Electronic Equipment destined for reuse in a manner that will safeguard its reusability, public and worker health, the environment, and protect it from damage during loading, transit, and unloading,

e) Verify Direct Reuse market

The Organization shall confirm that every sale or donation of Electronic Equipment and components is destined for Direct Reuse, and not for Recycling (including repair) or Final Disposal, by documenting and maintaining:

1. A copy of the contract, invoice, or receipt relating to the sale and/or transfer of ownership or equipment, which states:
  - ▶ The name and address of the buyer/receiver, including country<sup>35</sup>,
  - ▶ That the equipment or components are Fully Functional (or in the case of exemptions found in 4.4.6.2 a) Table 1, required records), and
  - ▶ That the equipment or components are being sold, donated, and/or received for Direct Reuse,

<sup>35</sup> Alternatively, tested and Fully Functional equipment and components (4.4.6.2.a) may be sold for reuse without proof of reuse market if the Organization documents and implements a procedure to show that the selling price is at least three times more than the prevailing scrap for each sale. In this case, the Organization shall obtain and maintain a) objective evidence of the prevailing scrap rate at the time of sale for each type of tested and Fully Functional equipment and/or components sold, and b) the weight of the equipment and/or components, their selling price, and a calculated price per unit of weight.



2. Bills of lading/waybills and/or other relevant Shipping Records, if shipping is involved, with both the buyer/receiver and seller/donor listed,

f) Take back Hazardous Electronic Equipment

The Organization shall always accept back, free of charge, equipment and/or components which originated from the Organization's facility or Control if they were misrepresented to the customer, and/or if they are comprised of or contain Hazardous Electronic Equipment but were subsequently determined to be non-functional, including those broken during shipment or significantly different than described,

g) Ensure responsible management of resulting e-Waste

All scrap, e-Waste, and material generated from Repair/Refurbishment activities that meet the definition of HEWs and/or PCMs shall be managed according to the applicable requirements for such materials in this Standard, and

h) Control outsourced reuse activities

If outsourcing any reuse tasks (4.4.6.2), retain full responsibility for all outsourced tasks and establish, implement, and maintain a system of controls to ensure that the Organization:

1. Only transfers Electronic Equipment to End Refurbishers that are Immediate Downstream Processors and that complete<sup>36</sup> all applicable requirements in this section (4.4.6.2), except as allowed in the note below,
2. Assumes that Electronic Equipment which is being exported for Repair/Refurbishment is Hazardous e-Waste and the Organization only transfers it to End Refurbishers in conformity with export requirements (4.3.2.1 and 4.4.6.7), unless there is objective evidence accompanying each shipment that it contains no HEEs, and
3. Ensures that all scrap and e-Waste generated by the Repair/Refurbishment Process is managed in conformity with 4.4.6.4 (Responsible Management of Electronic Equipment), 4.4.6.5 (Downstream Accountability), 4.4.6.6 (Final Disposition), and 4.4.6.7 (Export).

NOTE: If outsourcing ink and toner cartridges for remanufacturing, the Organization may allow their End Refurbisher to further outsource cartridge remanufacturing if the Organization verifies that the End Refurbisher (i.e. the Organization's Immediate Downstream Processor):

- ▶ Outsources cartridge remanufacturing tasks to their next tier remanufacturer who shall not further outsource tasks and shall complete them in conformity with the Organization's requirements in 4.4.6.2,
- ▶ Performs a thorough visual inspection of all cartridges prior to transferring them to a next tier remanufacturer, and only sends cartridges which appear viable for remanufacturing and are packaged in a manner that prevents leakage and spills of inks and/or toners during handling, storage, and transport, and
- ▶ Executes a written agreement with their next tier remanufacturer to only sell or donate tested, working ink and toner cartridges and dispose of the resulting wastes according to 4.4.6.6 (Final Disposition) and 4.4.6.7 (Export).

#### 4.4.6.3 Data security

The Organization shall prevent unauthorized access to or release of any Customer Data, regardless of whether data storage devices are going for reuse, Materials Recovery, or Final Disposal. The Organization shall offer data security services in-house and/or under their Control, and shall retain

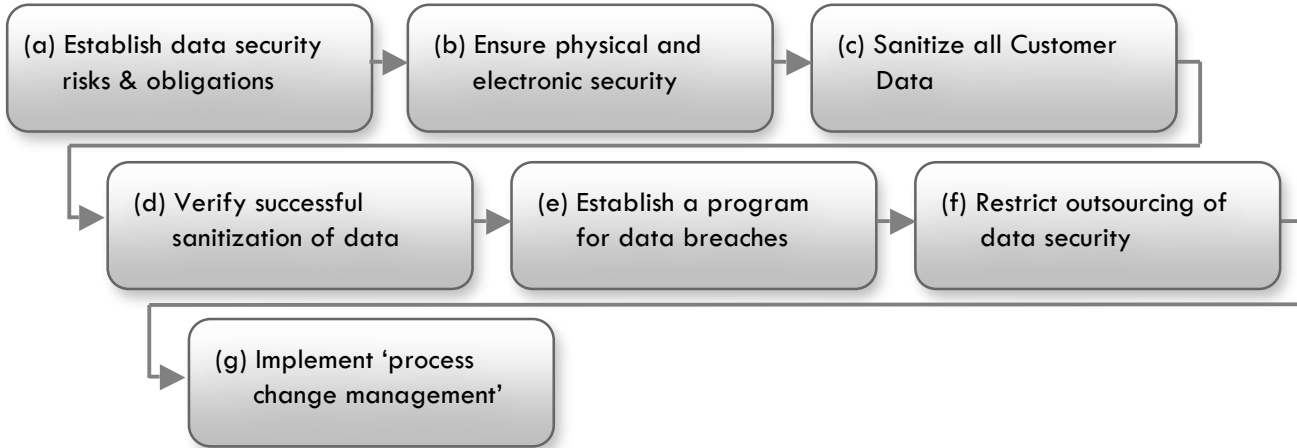
<sup>36</sup> i.e. do not further outsource any reuse tasks





responsibility for protecting and preventing unauthorized access to or release of Customer Data, regardless of whether or not the Organization outsources any of the associated activities.

The following is an overview of additional data security requirements, described in more detail in the following sections:



The Organization shall develop, document, implement and maintain a system of procedures and controls that includes the following:

a) Establish and communicate data security risks and obligations

Inform customers of data security risks, and communicate in writing with customers the Organization's explicit role, service obligations and agreements, and customer indemnifications, if any, regarding the data security services that are and/or are not provided. In addition, for customers that are utilizing the Organization's data security services, this includes communication of:

1. Types of assets and other material for which the Organization is sanitizing data,
2. Method(s) by which data sanitization shall be accomplished, e.g. software-based media overwriting processes, degaussing, and/or physical destruction of media,
3. Any additional information the customer has required the Organization to sanitize (i.e., in addition to Customer Data, e.g. asset tags and customer logos),
4. Data security standard(s) that is achieved in securing and sanitizing Customer Data,

b) Ensure physical and electronic security

Develop, implement, and maintain written procedures for physically securing data storage devices, and data processing systems used in the delivery of data security services<sup>37</sup>. The Organization shall establish, implement, and maintain controls to physically and electronically protect all Customer Data until it is sanitized (or returned to the customer), whether data storage devices<sup>38</sup> are going for reuse, Materials Recovery, or Final Disposal, for each device throughout the chain of custody. This system of controls shall:

1. Identify the data-bearing characteristics of the assets types for which they provide services, on an ongoing basis,

<sup>37</sup> While this Standard does not require certification to the ISO 27002-2005 Code of Practice for Information Security Management standard, Organizations are encouraged to pursue such certification.

<sup>38</sup> This includes solid state drives and hybrid drives



2. Establish and document a clearly defined chain of custody for Customer Data, including the following:
    - ▶ Stipulate when and where the transfer of custody to the Organization begins and ends for Customer Data, i.e. until it is sanitized (including destruction),
    - ▶ Provide secure logistics for data security, including the transport of customer/user assets to the Organization's facility(s), between the Organization's own facilities, and/or to the End Refurbisher(s), and maintain effective physical and electronic controls throughout the transport and transfer processes, and
    - ▶ Ensure that any locations where customer assets may be temporarily stored during the Organization's transport and transfer processes operate under a comparable set of security requirements as defined in 4.4.6.3. b) 3 below,
  3. Provide effective controls to physically and electronically secure facilities and equipment, in order to:
    - ▶ Ensure that only authorized personnel are allowed access to areas where Customer Data is stored and where data security services are performed,
    - ▶ Isolate areas where data security services are performed from locations where unauthorized people can enter the property, such as loading and unloading areas,
    - ▶ Prevent data from being electronically accessible, even if physically controlled, and
    - ▶ Restrict or control entry and exit of authorized guests in secure areas, as appropriate,
  4. Implement controls to mitigate data security risks associated with workers, including but not limited to background verification checks on all workers and temporary service providers who are involved in the delivery of data security services, and
  5. Establish effective inventory control by documenting and tracking the custody of all data storage devices and sanitization activities on them, including:
    - ▶ Clearly identify all equipment and components that require data security services either by using a manufacturer-designated serial number or assigning a unique number for each device, or by designating secure accumulation areas for non-serialized data storage devices,
    - ▶ Document their physical location and data security status throughout the chain of custody,
    - ▶ Implement handling procedures to ensure inventory integrity until data sanitization is complete, to prevent access to accumulated media, and track accumulation containers' physical locations until Customer Data is sanitized (e.g. media destruction), and
    - ▶ Provide inventory tracking information to customers regarding their data storage devices and sanitization status, and allow customers to audit inventory tracking processes, upon their request,
- c) Sanitize all Customer Data (such as purging, clearing, or destroying data storage devices)

Unless otherwise requested by the customer in writing, effectively sanitize all Customer Data prior to leaving the Organization's Control<sup>39</sup>, so that data storage devices are permanently unusable, unreadable, and/or indecipherable, including solid state and hybrid drives, in accordance with 4.3.2

<sup>39</sup> Organizations and/or their End Refurbishers may sanitize data storage devices in a mobile environment, such as in a vehicle designed to provide data security and destruction, if the vehicle, its equipment, and processes meet e-Stewards requirements for data security and protect human health and the environment.



Legal and Other Requirements, including written customer requirements. This shall be achieved by conforming either to a published national standard for data security in the country or region in which services are being delivered or with the current version of NIST Special Publication 800-88 Guidelines for Media Sanitization, whichever is more stringent. The Organization shall ensure that all data storage devices sold or donated for reuse have been sanitized of Customer Data and that:

1. Licensed software has been permanently removed unless the device is being returned to software licensee, or is legally transferred,
  2. Devices are physically destroyed if data sanitization requirements of this section 4.4.6.3 cannot be met. Thresholds for physical destruction shall be established for the quantity of addressable locations whose failure prevents data elimination through overwriting, and
  3. Paper and other media containing Customer Data, such as letterhead paper, logos, or tags/stickers, are removed from equipment and components, including from internal paper pathways of imaging equipment,
- d) Verify successful sanitization of Customer Data, whether clearing, purging or destroying data storage devices

The Organization shall:

1. For all data storage devices going for reuse, verify that prescribed overwrite instructions have been successfully executed for 100% of a device's physical memory locations. Where the prescribed overwrite instructions cannot be executed successfully for all physical memory locations (i.e., failed sectors), logging shall include identification of these locations, and shall account for 100% of the media's physical memory locations or shall result in the logged destruction of the 'failed sector' drives/storage devices,
  2. For all data storage devices going for destruction (including Materials Recovery and/or Final Disposal), verify physical destruction processes are completed via a 'validation of process' execution,
  3. Provide verification records of successful sanitization for each serialized device and/or for each container of non-serialized data storage devices, or if allowed by the customer, successful sanitization of batches of their data storage devices,
  4. Perform regular internal review of risk mitigation processes, to identify and mitigate points-of-failure, and improve process capability and durability<sup>40</sup>, and
  5. Verify and log information to customers for their data storage devices upon their request, except as contractually stipulated, and allow customers to audit data destruction verification and logging processes,
- e) Establish a program for data security breaches

An Organization shall establish and implement procedures to prevent, detect and respond effectively and quickly to information security breach<sup>41</sup> incidents. Should there be a data security breach, the Organization shall:

1. Inform relevant authorities in a timely manner,
2. Report the breach to the impacted customer(s) in a timely manner, and

<sup>40</sup> "Durability" refers to the ability to perform a designed function for an extended length of time.

<sup>41</sup> "Breach" refers to the intentional or unintentional release of Customer Data and/or private information to an unapproved party or environment.



3. Collect evidence from the time that a security breach is initially detected, retain and present it in conformity with the rules of evidence in the relevant jurisdiction(s), if the security breach incident involves legal action (civil or criminal),

f) Restrict outsourcing of data security

If outsourcing any data security tasks, an Organization shall retain responsibility for Customer Data and shall implement, operate, and maintain a documented system of controls that:

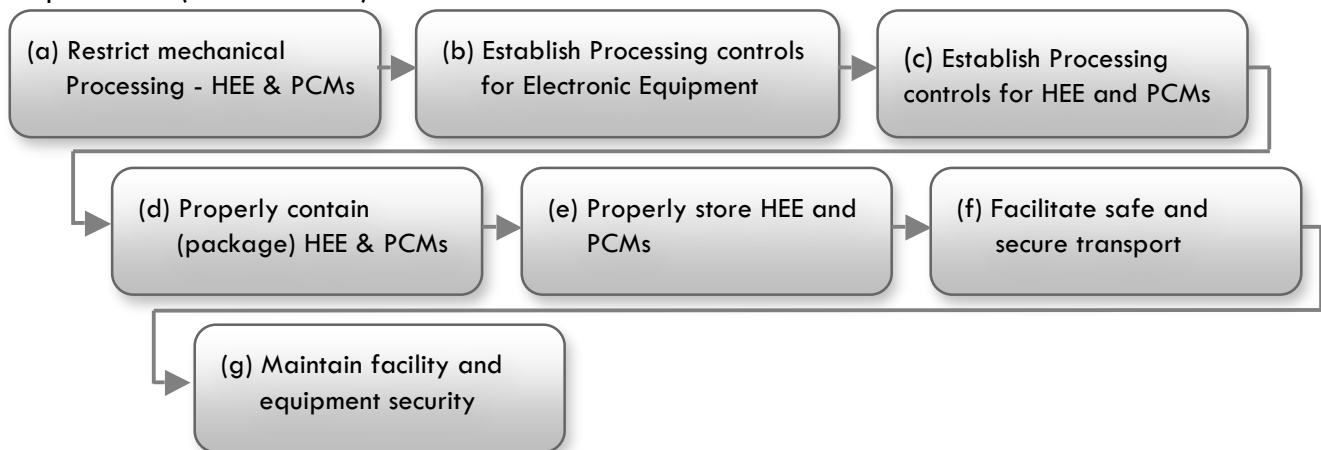
1. Allows outsourcing only to Immediate Downstream Processors that are End Refurbishers,
2. Ensures that the End Refurbisher completes and conforms to the applicable requirements in sections 4.4.6.2 (Reuse) and 4.4.6.3, and does not further outsource any of these tasks, and

g) Implement documented 'process change management' procedures

An Organization shall establish and implement a documented management-of-change procedure to document, train workers, and communicate changes in the performance of data security services, and notify customers of such changes in a timely manner.

#### 4.4.6.4 Responsible management of Electronic Equipment

An Organization shall manage all Electronic Equipment on-site and/or under their Control in conformity with their management plan (4.3.4), with best available techniques and practices which are protective of human health and the environment, whether or not such activities have been identified as significant Environmental and Stewardship Aspects, and according to the following requirements (details below):



The Organization shall:

- a) Restrict or disallow mechanical Processing of these Hazardous Electronic Equipment (HEE) and Problematic Components and Materials (PCMs)

Ensure that the items listed in Table 2 are safely removed from Electronic Equipment, separated, and not mechanically Processed (e.g. shredded), unless the mechanical Processing is accomplished by an operation which uses best available technologies specifically designed to Process the specific material in a closed system with engineering controls that prevent releases to the environment and work area, with workers fully protected from exposure. In addition, the Organization should only disassemble components to a level at which they can safely manage the associated hazards.



**Table 2: Items to be removed so they are not mechanically Processed, unless specifications in paragraph 4.4.6.4 a) are met**

▶ Mercury-containing components including mercury lamps, LCD screens, switches, batteries & subcomponents
▶ Cathode ray tubes (CRTs) including Phosphors, and other leaded display glass, such as leaded plasma display glass
▶ Glycolant coolants (e.g. in old rear-projection CRT display devices)
▶ Lithium button, lithium ion, and lead acid batteries, and batteries that have a potential for explosion
▶ Toners, inks, and toner & ink cartridges (liquid, pasty & powder), and their uncleaned cartridges
▶ Magnetrons in microwave ovens and other equipment, if they contain beryllium oxide ceramic insulators
▶ Polychlorinated biphenyl (PCB)-containing components
▶ Printer and copier drums and other components containing selenium and/or arsenic
▶ Radioactive devices or materials, such as some smoke detectors and nuclear medicine devices
▶ Any additional materials deemed hazardous, explosive, corrosive, or otherwise problematic for mechanical Processing, by the Organization or applicable regulations

b) Establish Processing controls for Electronic Equipment

Only Process Electronic Equipment which the Organization has the technical capability and operational capacity to Process, and establish and maintain:

1. Controls for mechanical size reduction (such as shredding), if applicable, which include installation and maintenance of emergency shut-off switches, and/or for materials separation (manual or mechanical) which protect workers & the environment from hazards,
2. Effective air quality control systems and procedures, if necessary based on air monitoring results, to capture and contain dust, gases, and vapors to prevent hazards and releases, including during removal of used pollution control filters, and
3. Processing of all Electronic Equipment only in enclosed, weatherproof sheltering in a manner that protects materials from adverse atmospheric conditions and leaching,

c) Establish Processing controls for HEE and PCMs

Establish operational controls and procedures for Processing HEWs & PCMs as follows:

1. Process HEE only on impermeable flooring,
2. Capture and contain Phosphors in a manner that prevents dispersal and exposures,
3. Never intentionally open sealed devices containing polychlorinated biphenyls (PCBs),
4. Minimize dispersal of toners and inks and breakage of their cartridges or containers, until they reach the point of qualified remanufacture or Final Disposal,
5. Separate batteries which have the potential for unintentional discharges, in ways that will not allow such discharge during storage, transportation, and handling,
6. Never incinerate (including waste-to-energy) materials which contain mercury, Halogenated Materials, and/or beryllium (unless required by law), and
7. Identify, isolate, and properly contain potentially radioactive equipment or materials, e.g. in nuclear medicine electronic devices and/or smoke detectors,



d) Properly contain (package) HEE and PCMs

Safely consolidate and contain HEE and PCMs in a manner which prevents leaching, leakage, spills, dispersal, and releases of vapors, fumes, particulates, dust, liquids, and/or other forms of dangerous materials, including:

1. Safely separate and consolidate removed HEE and PCMs [4.4.6.4.a)], and place in containers that:
  - ▶ Protect human health and the environment during storing and shipping of each material,
  - ▶ Meet the packaging and shipping requirements of respective Downstream Processors,
2. Accurately and visibly label containers according to their contents and packaging type, and
3. Prevent container damage, collapse, and contamination,

e) Properly store HEE and PCMs

Ensure that HEE and PCMs are stored, onsite and offsite, in a manner which prevents fires and contamination of air, soil, groundwater, and storm water runoff, including storage in:

1. Weatherproof sheltering with impermeable flooring,
2. Designated and labeled storage areas (or containers),
  - ▶ In a manner which minimizes spills, breakage, and injuries,
  - ▶ According to regulatory storage limits, including maximum time limits and quantities allowed in storage,

f) Facilitate safe and secure transport and shipping

Establish procedures to ensure safe and legal transportation/shipping of Electronic Equipment, including HEEs and HEWs, under the Organization's Control in a manner that allows optimal conditions for reuse & Recycling, and minimizes risks to human health and the environment, including:

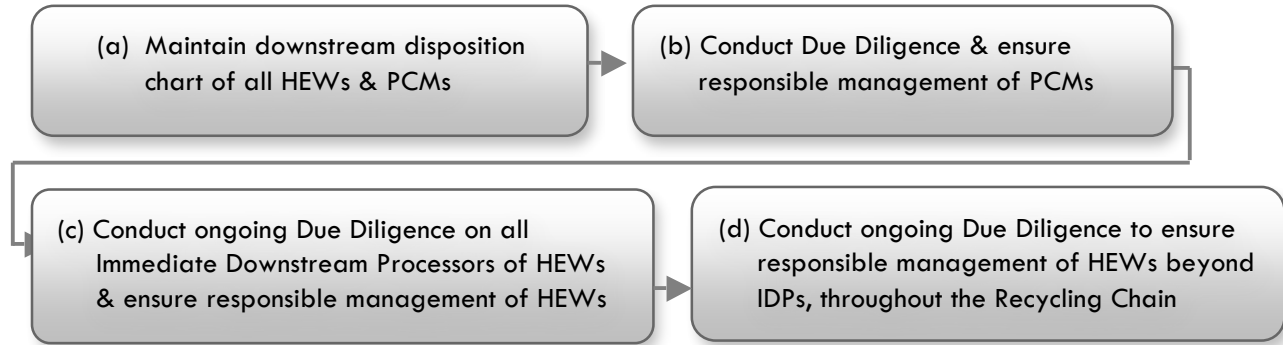
1. Accurate classification and labeling/placarding, record keeping, and appropriate packaging and security for transport, and
2. Use of transporters that have all legal authorizations, and adequate insurance or financial guaranty to cover costs in the event of an accident or injuries, and

g) Maintain facility and equipment security

Establish and maintain a system of controls that secures Electronic Equipment, inside and outside the facility, including storage, and clearly defines the beginning and end of the Organization's chain of custody of the materials, commensurate with the Organization's agreements and protection of affected stakeholders and the surrounding community.

#### 4.4.6.5 Accountability for downstream recycling

An Organization shall establish, implement, document, and maintain an effective system of controls to track all HEWs and PCMs to Final Disposition, perform ongoing Due Diligence, and ensure these materials are managed in a manner that protects human health and the environment throughout each material's Recycling Chain, in facilities approved by the e-Stewards Organization in conformity with this Standard as summarized in the flow chart below:



Specifically, the Organization shall:

a) Establish an up-to-date downstream disposition chart of HEWs and PCMs

Create and maintain an up-to-date document which indicates the material flow and chain of all facilities and Brokers managing PCMs and HEWs which come through the Organization's facility and/or Control, including HEW residuals and Electronic Equipment going to End Refurbishers, throughout each material's Recycling Chain in accordance with Appendix A.4.4.6.5 a),

b) Conduct Due Diligence & ensure responsible management of PCMs throughout Recycling Chain  
Prior to shipment, and Annually thereafter, verify and document that PCMs are only transferred to downstream destinations in accordance with 4.4.6.6 (Final Disposition) and 4.3.2.1 (Legal Exports),

c) Conduct ongoing Due Diligence on all Immediate Downstream Processors (IDPs) and ensure responsible management of HEWs by IDPs

Ensure HEWs are managed only in approved IDP facilities, with or without Intermediaries involved in transfers to these facilities, in accordance with requirements in Appendix A.4.4.6.5 c) and the following:

1. Evaluate, perform on-site audits of, and approve each IDP: Prior to initial shipment and at least Annually thereafter, evaluate and approve each IDP used for Recycling (including Repair/Refurbishment) and/or Final Disposal of the Organization's HEWs in conformity with requirements in this section 4.4.6.5 c), and perform on-site audits of each IDP using qualified auditors, unless IDP has a current and valid e-Stewards certification, in which case no on-site audit is required. If the IDP is an End Processor, the Organization or their qualified auditor shall perform on-site audits at least every 3 years,
2. Ensure IDP controls their downstream: Ensure the e-Stewards Organization's system of controls extends to the entire Recycling Chain for each HEW, including create and enforce written agreements<sup>42</sup> with each IDP to control and restrict destinations of HEWs to only approved facilities downstream of IDPs, throughout the Recycling Chain, unless the IDP for a particular HEW or PCM is a certified e-Stewards recycler,
3. Maintain ongoing records: Maintain objective evidence, including Shipping Records, of all the Organization's outgoing shipments and sales of HEWs and the corresponding acknowledgements of receiving and Processing these same shipments from each IDP<sup>43</sup>, including certified e-Stewards recyclers, and

<sup>42</sup> If the IDP is an End Processor, such as a smelter or mercury retort operation, the Organization may alternatively obtain and maintain objective evidence of the End Processor's current and valid accredited certifications to ISO 14001 and OHSAS 18001, and shall advise the End Processor of the Organization's requirements in 4.4.6.6 (Final Disposition) and document End Processor's acknowledgement of these requirements.

<sup>43</sup> End Processors may provide records Annually.



- 4. **Ensure IDPs have an environmental, health, and safety management system:** Confirm that each Immediate Downstream Processor (except Final Disposal facilities) managing the Organization’s HEWs fully implements, Annually reviews, and updates as needed a documented management system for: identifying and complying with legal requirements; identifying and effectively responding to environmental, health, and safety impacts and risks; and continually evaluating and improving that system and their operations accordingly.

NOTE: In the rare cases when Electronic Equipment from an Organization’s customer<sup>44</sup> is sent directly to a non-certified e-Stewards Recycling facility, the Organization shall perform initial and ongoing Due Diligence on such facilities, in accordance with all requirements in this section (4.4.6.5), as well as including all such Electronic Equipment in the Organization’s material balance accounting (4.5.1.3 a) - c).

- d) Conduct ongoing Due Diligence to ensure responsible management of HEWs beyond IDPs, throughout the Recycling Chain, including when other certified e-Stewards are involved

At least Annually, and whenever changes in vendors and Brokers are made, evaluate and approve Downstream Processors and Final Disposal facilities beyond the IDPs, throughout the Recycling Chain, for each of the Organization’s HEWs and their HEW residuals, and conduct ongoing Due Diligence, in accordance with requirements in Appendix A.4.4.6.5 d), including:

- 1. **Verify business relationships downstream:** Confirm with objective evidence<sup>45</sup> ongoing business relationships between each Downstream Processor and their downstream facilities throughout the Recycling Chain, including verification that written agreements or alternative control systems are in place and enforced between each facility throughout the Recycling Chain to restrict HEWs and their HEW residuals in conformity with the Organization’s e-Stewards obligations found in this section 4.4.6.5, in 4.4.6.6 (Final Disposition), and in 4.4.6.7 (Export),
- 2. **Confirm ongoing materials flow and records:** Create, maintain, and implement a written procedure for reviewing and documenting an Annual random sampling of HEW shipments between each vendor in the Recycling Chain of HEWs, and
- 3. **Ensure Downstream Processors have an environmental, health, and safety management (EHSMS) system:** Confirm that each Downstream Processor managing the Organization’s HEWs fully implements, Annually reviews, and updates as needed a documented management system for: identifying and complying with legal requirements; identifying and effectively responding to environmental, health, and safety impacts and risks; and continually evaluating and improving that system and their operations accordingly.

#### 4.4.6.6 Restrictions on Materials Recovery and Final Disposition operations

An Organization shall ensure that Hazardous e-Waste (HEWs) and Problematic Components and Materials (PCMs) destined for Materials Recovery and/or Final Disposition are treated, Processed, and managed only in types of facilities or applications, throughout the Recycling Chain, as allowed by law and as listed below, including Table 3, with or without Intermediaries involved. Requirements are summarized in the flowchart, with details below:



<sup>44</sup> This assumes that the e-Stewards Organization is either representing services as e-Stewards services and/or benefitting in some way. <sup>45</sup> e.g. via buy/sell agreements, scope of work agreements, or memorandums of understanding (MOUs)





Specifically, the Organization shall:

- a) Ensure that such facilities are licensed and permitted, as required by applicable jurisdictions, to receive and Process or utilize the specific materials received,
- b) Ensure that such facilities use best available techniques and processes/applications designed to safely recover and reuse maximum materials (except as limited in 3 below) and responsibly dispose of non-recyclable fractions, including:
  1. Prevent contamination of air, land, and water, including emissions and releases of hazardous chemicals, elements, and compounds, in any form,
  2. Manage residuals, by-products, and breakdown products of HEWs as hazardous waste, unless the facility regularly demonstrates that a specific type of residual:
    - ▶ Falls below the thresholds found in the definition of Hazardous e-Waste, e.g. by using a toxicity characteristic leaching procedure, and
    - ▶ Is not considered a hazardous waste by applicable regulation, and
  3. Permanently retire<sup>46</sup> asbestos, polychlorinated biphenyls, and radioactive materials in hazardous waste facilities licensed and permitted to manage the specific material for long term storage or destruction,
- c) Ensure that, unless otherwise required by law, no downstream operations receive the Organization's HEWs or PCMs, directly or indirectly, if they:
  - ▶ Melt or burn Electronic Equipment in open fires,
  - ▶ Incinerate (including waste-to-energy) materials which contain mercury, Halogenated Materials, and/or beryllium,
  - ▶ Smelt Electronic Equipment without effective controls to capture emissions, including mercury, beryllium, and halogenated compounds such as dioxins, furans, and brominated flame retardant compounds, consistent with local and national regulations, or
  - ▶ Allow HEWs or PCMs to be used in hydraulic fracturing or injection wells,
- d) Ensure that no HEWs are disposed of in solid waste disposal operations, other than exceptions found in Rows 6 & 8 in Table 3 (treated leaded display glass & treated Processing residuals),

NOTE: Hazardous waste landfills may be used for a particular HEW, as a last resort, if a) – d) and all of the following conditions are met:

- ▶ There are no feasible Materials Recovery facilities in country or available via legal export to an OECD/EU country for environmentally sound management, as determined and documented by the Organization,
- ▶ There are hazardous waste laws in the country which allow hazardous waste land filling of the particular material, and
- ▶ The hazardous waste landfill has current permits to accept and dispose of the specific material in question, and is lined and leachate-controlled or encapsulated, and monitored long-term.

<sup>46</sup> i.e. do not allow back into the marketplace for further use in products or processes



- e) Ensure that Processes utilizing HEWs in new/alternative applications (uses) (i.e. other than Materials Recovery or Final Disposal) have been approved in writing by the e-Stewards program administrator<sup>47</sup>, and
- f) Restrict HEWs and PCMs to approved facilities according to the requirements in Table 3 below, unless otherwise required by law:

**Table 3 Restrictions on Materials Recovery & Final Disposition Operations for HEWs and PCMs (in addition to restrictions above)**

Type of HEW or PCM:	These HEWs or PCMs shall:
1. Arsenic-containing equipment or components if defined as HEE	<ul style="list-style-type: none"> <li>▶ Not be openly burned or Processed in operations which release arsenic or its compounds to the biosphere; and</li> <li>▶ Be sent to hazardous waste disposal or Processed by integrated smelters or other types of facilities capable of effectively recovering arsenic and arsenic compounds.</li> </ul>
2. Batteries – Sorted <u>alkaline</u> & non-hazardous batteries <sup>48</sup>	<ul style="list-style-type: none"> <li>▶ Be recycled in battery recycling facilities or steel mills that recover the metal value, even if disposal is allowed by law, or</li> <li>▶ If no recycling markets or options are available, including legal exports, these batteries may be disposed of in legally permitted solid waste landfills.</li> </ul>
3. Batteries – if defined as HEE	<ul style="list-style-type: none"> <li>▶ Be recycled in a battery recycling facility which recovers the metal value from the batteries and properly handles hazardous materials, including potentially corrosive &amp; explosive constituents, or</li> <li>▶ If no recycling markets or options are available, including legal exports, batteries may be disposed of in legally permitted hazardous waste disposal facilities.</li> </ul>
4. Beryllium-containing components defined as HEE	<ul style="list-style-type: none"> <li>▶ Never be Processed in incinerators of any kind,</li> <li>▶ Be sent to integrated smelters which agree to accept beryllium-containing components and are equipped to responsibly Process and capture beryllium, or</li> <li>▶ Be sent to hazardous waste landfills licensed &amp; permitted to manage beryllium</li> </ul>
5. Cathode ray tubes (CRTs) (with or without vacuum) & CRT glass that is <u>uncleaned</u>	<ul style="list-style-type: none"> <li>▶ Never be placed in solid waste disposal operations, and</li> <li>▶ Be directed to:                             <ul style="list-style-type: none"> <li>▶ A CRT glass processor, in conformity with 4.4.6.7 (Export), for preparation for use in the manufacture of new products,</li> <li>▶ A lead smelter, integrated copper smelter, or other technology capable of recovering lead and cadmium,</li> <li>▶ As a last resort, a lined, leachate-controlled hazardous waste landfill, unless forbidden by law.</li> </ul> </li> </ul>

<sup>47</sup> Decisions will be made on the basis of research, expert advice, and scientific evidence of risks involved. If new technologies are proprietary, the program administrator will sign a non-disclosure agreement in order to review pertinent information. If new technologies are not proprietary, the e-Stewards Technical Committee may provide recommendations to program administrator regarding the acceptability of such technologies. A dispute resolution process will be available.

<sup>48</sup> May not contain lead, mercury, cadmium, lithium, flammable organic solvents, or unknown contents



Type of HEW or PCM:	These HEWs or PCMs shall:
<p>6. <u>Cleaned</u> display glass containing lead, including:</p> <ul style="list-style-type: none"> <li>▶ CRT glass, and</li> <li>▶ Some flat panel display glass, e.g. leaded plasma glass</li> </ul>	<ul style="list-style-type: none"> <li>▶ Be thoroughly cleaned of Phosphors, coatings, frit, fines, and particulates,</li> <li>▶ Be Processed in any of the following types of facilities:                             <ul style="list-style-type: none"> <li>▶ Facilities which completely utilize the leaded glass in manufacturing new products that will not leach metals during their useful life,</li> <li>▶ Lead smelter, integrated copper smelter, or other thermal technology capable of recovering lead, or</li> <li>▶ Hazardous waste landfill, and</li> </ul> </li> <li>▶ Never be placed in solid waste disposal operations, except, as last resort, in a lined, leachate-controlled &amp; monitored solid waste disposal facility <u>if</u> the cleaned glass has first been stabilized with a pre-treatment method in accordance with applicable laws and, as a result, passes the TCLP and thresholds found in definition of HEW (unless prohibited by law or facility).</li> </ul>
<p>7. CRT glass that is <u>non-leaded</u> &amp; thoroughly cleaned<sup>49</sup> of Phosphors, coatings, frits, and fines</p>	<ul style="list-style-type: none"> <li>▶ Be allowed for use in alternative applications, if they will not leach metals during their useful life, and</li> <li>▶ As a last resort, may be disposed of in solid or hazardous waste disposal facilities, if allowed by law.</li> </ul>
<p>8. CRT Processing residues and CRT residues, including :</p> <ul style="list-style-type: none"> <li>▶ CRT Phosphors,</li> <li>▶ Coatings,</li> <li>▶ Frits,</li> <li>▶ Fines, and</li> <li>▶ Waste streams contaminated with them</li> </ul>	<ul style="list-style-type: none"> <li>▶ Never be Processed in incinerators of any kind,</li> <li>▶ Always be considered HEWs for the purpose of export,</li> <li>▶ Be Processed in one or more of the following facilities that have been notified and have consented in writing in advance to accept such materials:                             <ul style="list-style-type: none"> <li>▶ Facility that reclaims rare earth &amp; critical metals (e.g. in Phosphors),</li> <li>▶ Primary or secondary smelter that recovers lead &amp; cadmium,</li> <li>▶ Lined, leachate-controlled, and monitored solid waste landfill, <u>only if</u> residues have first been stabilized with pre-treatment in accordance with applicable laws and pass TCLP &amp; thresholds found in definition of HEW,</li> <li>▶ Lined, leachate-controlled and monitored hazardous waste landfill, and</li> </ul> </li> <li>▶ If Phosphors cannot be recycled, and if allowed by law, store them in safe, monitored, retrievable hazardous waste storage for future Recycling, e.g. of critical metals.</li> </ul>
<p>9. Glycol-based coolants</p>	<ul style="list-style-type: none"> <li>▶ Be recycled (preferably) in a facility which decontaminates and restores coolant properties, or</li> <li>▶ Be finally disposed of with treatment as a specially controlled liquid waste.</li> </ul>

<sup>49</sup> As determined by a TCLP or equivalent method via a regular sampling



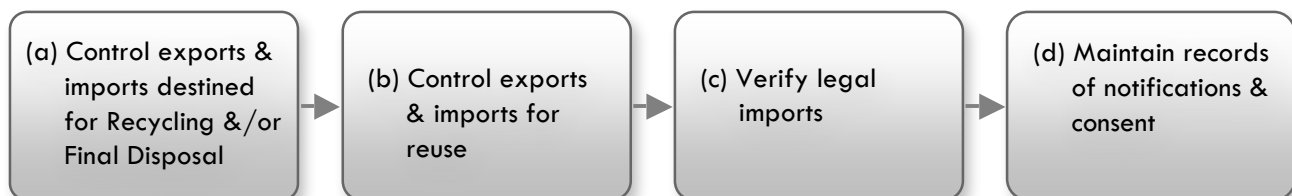
Type of HEW or PCM:	These HEWs or PCMs shall:
<p>10. Inks and toners, including liquid, pasty, and powder forms</p>	<ul style="list-style-type: none"> <li>▶ Managed in facilities that prevent explosions and respiratory hazards according to the following hierarchy, in order of preference:                             <ol style="list-style-type: none"> <li>1. Reuse cartridges by refurbishing or remanufacturing them,</li> <li>2. Recycle emptied and cleaned cartridges in plastics recovery facilities, and recover carbon black for use in manufacturing, if possible,</li> <li>3. Remove inks &amp; toners, dispose of color inks &amp; toners in hazardous waste landfills, and black inks &amp; toners in solid or hazardous waste landfills,</li> <li>4. Dispose of entire units including inks and toners in hazardous waste landfills or incinerators, and/or</li> <li>5. Dispose of ink and toner cartridges and containers in a solid waste landfill only if the landfill has been notified and consented in writing in advance to accept ink and toner cartridges and containers as profiled &amp; documented.</li> </ol> </li> </ul>
<p>11. Mercury and mercury-containing devices</p>	<ul style="list-style-type: none"> <li>▶ Never be Processed in incinerators of any kind,</li> <li>▶ Not be 'recovered' in metals smelters, including smelters that recover mercury in the form of calomel and/or utilize mercury capture systems not designed for full mercury recovery from waste materials or secondary sources, and</li> <li>▶ Preferably be permanently retired (before or after mercury retort operations) in a monitored, secure, and retrievable long term mercury storage facility and not recovered for reuse, or</li> <li>▶ Be Processed at mercury retort facilities until or unless such long term mercury storage is available, in a facility that achieves a minimum of 99.99% mercury capture and recovery.</li> </ul>
<p>12. Plastics &amp; resins with Halogenated Materials, including:</p> <ul style="list-style-type: none"> <li>▶ Plastics that are baled, shredded, or whole, with or without metal contamination,</li> <li>▶ Cleaned ink and toner cartridges with such plastics</li> </ul>	<ul style="list-style-type: none"> <li>▶ Not be melted or burned in open fires,</li> <li>▶ Preferably be recycled in plastics recovery facilities which separate and recover reusable plastics as long as, prior to shipment, the Organization obtains current valid operating and environmental licenses &amp; permits to Process the specific plastics/resins. The unrecyclable plastics, waste materials, and residues shall be Processed via one of the plastic disposal Processes set forth immediately below,</li> <li>▶ Be Processed in a smelter which continuously monitors, captures, and restricts emissions, including dioxins, from flue gas stacks,</li> <li>▶ As a last resort, be disposed of in a leachate-controlled solid or hazardous waste landfill.</li> </ul>
<p>13. Polychlorinated biphenyl-containing components with PCB concentrations above 50 ppm or quantity unknown</p>	<ul style="list-style-type: none"> <li>▶ Never be opened up, recycled, or shredded, except by PCB processors that meet qualifications defined in remaining requirements in this section, and</li> <li>▶ Only be dismantled &amp; Processed by a processor that is trained and compliant with both:                             <ul style="list-style-type: none"> <li>▶ Basel Convention &amp; Stockholm Convention guidelines and obligations, and</li> <li>▶ Additional applicable national laws.</li> </ul> </li> </ul>



Type of HEW or PCM:	These HEWs or PCMs shall:
14. Printed circuit boards, or components or materials (e.g. shredded fractions) which contain lead solders, Halogenated Materials, or fail threshold levels in definition of HEE	<ul style="list-style-type: none"> <li>▶ Be pre-processed (e.g. shred the boards and refine/alloy metals in preparation for End Processors), if needed, in facilities which monitor and prevent releases of hazards, such as toxic dusts and stack emissions; and</li> <li>▶ Be Processed by End Processors that are either:                             <ul style="list-style-type: none"> <li>▶ Pyrometallurgical facilities, such as integrated copper smelters, that monitor and restrict fumes and emissions, including continuous dioxin monitoring from flue gas stacks, and/or</li> <li>▶ Hydrometallurgical facilities that control and manage fumes, and all hazardous residues to prevent releases to the environment and/or exposures.</li> </ul> </li> </ul>
15. Radioactive wastes	<ul style="list-style-type: none"> <li>▶ Be transferred to a facility that meets international standards<sup>50</sup> for storage or disposal of radioactive wastes.</li> </ul>
16. Residuals from Processing, pollution controls, and housekeeping, such as bag-house dusts, filter residues, slags, and sweeps	<ul style="list-style-type: none"> <li>▶ Shall be managed as hazardous waste unless the Organization can regularly demonstrate that a specific type of residual:                             <ul style="list-style-type: none"> <li>▶ Falls below the thresholds found in definition of HEE, and</li> <li>▶ Is not considered a hazardous waste by regulation, and/or</li> </ul> </li> <li>▶ If allowed by law:                             <ul style="list-style-type: none"> <li>▶ Residuals which contain identifiable fractions of metals or other materials, e.g. sweeps from shredding or manual dismantling areas, may be reprocessed within the Organization's Processing systems, and/or</li> <li>▶ Residuals which contain high enough levels of precious metals or other materials to make them recyclable in either pyro- or hydrometallurgical facilities may be Processed according to requirements for printed circuit boards above.</li> </ul> </li> </ul>
17. Selenium-containing components <sup>51</sup>	<ul style="list-style-type: none"> <li>▶ Shall be transferred to a facility licensed and permitted to Recycle or dispose of selenium.</li> </ul>

#### 4.4.6.7 Export and import controls

The Organization shall establish, implement, document, and regularly update an effective system of controls in order to restrict exports and imports of Hazardous e-Waste (HEWs) and Problematic Components and Materials (PCMs) that enter their facility(s) or come under their Control and throughout the Recycling Chain, in accordance with 4.3.2.1 (Legal) and the following requirements:



Specifically, the Organization shall:

<sup>50</sup> Notably the instruments of the International Atomic Energy Agency (IAEA), including the Convention on Nuclear Safety, the Codes of Conduct, and the International Safety Standards.

<sup>51</sup> e.g. xerographic photocopier drums, older printer drums or analog copiers, some solar panels & other photovoltaic cells



a) Control exports and imports of PCMs and HEWs destined for Recycling and/or Final Disposal

The Organization shall not allow PCMs and/or HEWs to be exported or imported, directly or indirectly, except as stipulated in 4.3.2.1. However, the following materials may be traded if considered legal by all the countries concerned (export, transit, & import) and meet requirements below :

1. Plastics with Halogenated Materials may be exported to any country, but prior to export, the Organization shall obtain and maintain copies of current import permits from all facilities in other countries which receive the Organization's plastics with Halogenated Materials, as well as objective evidence of conformity to requirements in 4.4.6.6 h) Row 12,
2. Prepared CRT cullet, exported for use as a feedstock to manufacture new products that are deemed non-waste by the Competent Authority of the importing country shall not be considered an HEW, and will therefore not be subject to the import and export restrictions found in 4.3.2.1. This exception shall be allowed only if all of the following occur prior to exportation:
  - ▶ The cullet is thoroughly cleaned of Phosphors, coatings, and other dispersible particulates, using best available technologies,
  - ▶ It is determined, via objective evidence, that the cullet will be used as a direct feedstock in manufacturing new products without further Processing or preparation, other than quality control screening,
  - ▶ Any conditions placed on such legal trade by the Competent Authorities in the written determinations of any country concerned (export, transit, and import) are implemented,

b) Control exports and imports of Electronic Equipment for reuse

When exporting or importing, directly or indirectly, any Electronic Equipment (including components) for reuse from or to their facility and/or Control, the Organization shall:

1. Assume all Electronic Equipment which is being exported or imported for Repair/Refurbishment is Hazardous Electronic Equipment (HEE), unless there is objective evidence accompanying each shipment that it contains no HEEs and PCMs,
2. Ensure that each shipment of Electronic Equipment exported or imported for reuse only takes place in conformity with 4.3.2.1 (Legal Exports)<sup>52</sup> and 4.4.6.2 (Reuse)<sup>53</sup>, and
3. In addition to labeling requirements in 4.4.6.2 c), ensure that each shipment exported for reuse is accompanied by a completed and signed declaration/document found in Appendix A.4.4.6.7 b), attached in a manner that is easily accessible to officials and customers, without the need for unpacking, and

c) Verify legal imports of e-Waste

For incoming e-Waste that is not generated in-country, assure that Electronic Equipment Processed by the Organization has not been imported, directly or indirectly, into the Organization's country in violation of the Basel Convention and/or the Basel Ban Amendment, regardless of whether or not either instrument is in legal force nationally or internationally, and

d) Maintain records of Competent Authority notifications and consents for all legal shipments of HEWs.

<sup>52</sup> e.g., the Organization shall not export equipment or components for repair from OECD/EU countries or Liechtenstein to non-OECD/EU countries.

<sup>53</sup> Conformity with these sections does not require that cosmetic alterations or software loading be completed prior to export/import



#### 4.4.7 Emergency preparedness and response

*The Organization shall establish, implement and maintain a documented procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment, occupational health and safety, and data security and how it will respond to them.*

*The Organization shall prevent and respond to actual emergency situations and accidents and prevent or mitigate associated adverse environmental, occupational health and safety, and data security impacts.*

*The Organization shall periodically review and, where necessary, revise its emergency preparedness and response procedures, in particular, after the occurrence of accidents, injuries, or emergency situations.*

*The Organization shall also periodically test such procedures where practicable.*

##### a) Prevent fires and explosions

Take measures to prevent fires and explosions in and around facilities, by recognizing, evaluating, and controlling risks for both.

#### 4.4.8 Insurance

An Organization shall obtain and maintain liability insurance<sup>54</sup> adequate to cover the potential risks and liabilities, per occurrence and in the aggregate, as follows:

- a) Levels of insurance shall be commensurate with the nature and size of the Organization's operations<sup>55</sup>,
- b) The insurance shall cover liability for data privacy breaches, contractual liability, property damage, environmental pollution, and occupational health and safety impacts (e.g. hazardous exposures and releases, bodily injury, and accidents) and other emergencies, and
- c) The Organization shall retain the appropriate insurance to underwrite indemnification to customers, if indemnification is offered and allowed by law.

The Organization shall obtain professional advice and bids of at least two insurance actuaries regarding appropriate insurance for their site(s). The record of this professional advice shall be maintained as part of the e-Stewards records system and the insurance coverage ultimately chosen should fall within the range of the bids.

#### 4.4.9 Site closure plan and financial surety

The Organization shall create and maintain a site closure plan which stipulates how the Organization's closed site(s) will be tested and remediated (if necessary), and how all remaining Electronic Equipment will be properly managed in accordance with this Standard and regulations<sup>56</sup> in the event of sale, closure, abandonment, bankruptcy or any form of dissolution of the company/Organization. The Organization shall also provide a financial instrument(s) put into custody of a third party<sup>57</sup> to cover costs for the execution and completion of site clean-up and closure, even in the case of abandonment, according to this plan, including Electronic Equipment and residuals in storage. The plan shall include a closure schedule, as well as:

<sup>54</sup> Or its equivalent, in countries which do not allow insurance.

<sup>55</sup> Take into consideration whether or not operations break CRTs, manually dismantle, bale, shred, incur transportation liability, and/or incur non-owned disposal facility liability.

<sup>56</sup> e.g. based upon the regulatory authority's operating permit or site closure parameters for the facility

<sup>57</sup> e.g. in escrow, or insurance or bonds held by a third party, or in a financial tool specified by law.



- a) A description of the facility and inventory, including:
  1. Site description,
  2. Current plot (site) plan, and
  3. Estimates of the maximum amount, by weight or count, of whole electronic devices, Processed and sorted components and materials, and hazardous materials inventory that will have been held on site at any one time (based upon the active life of the facility), including an estimate of wastes that will be generated from closure activities,
- b) Closure activities
  1. Removal, transportation, Materials Recovery, and Final Disposition of all Electronic Equipment, waste, and HEWs & PCMs, including those in off-site storage areas,
  2. Industrial Hygiene monitoring during closure activities, if PHPTs were used at any time,
  3. Cleaning of the facility(s), and outside and off-site storage areas,
  4. Remediation & decontamination procedures & activities, if PHPTs are used at any time, and
  5. Closure cost estimates, including a breakdown for:
    - ▶ Final Disposition of each type of Electronic Equipment,
    - ▶ Clean-up, including cleaning, remediation, and decontamination activities,
    - ▶ Industrial Hygiene monitoring, and
    - ▶ Closure certification, if required by law, and
- c) A requirement for qualified third party testing, analysis, and remediation upon closure of all facilities and sites which have ever:
  - ▶ Utilized Potentially Hazardous Processing Technologies, and/or
  - ▶ Stored or managed Hazardous Electronic Equipment outside of sheltered and impermeably floored buildings.

This requirement includes:

1. Conduct indoor wipe (dust) sampling of areas and items which may have been contaminated by heavy metals, including lead, cadmium, and mercury, using sampling and analysis methodologies that provide results representative of facility and site contamination,
2. If any thermal operations were utilized in the facility (except hand-held soldering), conduct dust sampling on polycyclic aromatic hydrocarbons that likely result from thermally treated Electronic Equipment, and
3. Remediate any contamination above regulatory limits for industrial site remediation.

## 4.5 Checking

### 4.5.1 Monitoring and measurement

*The Organization shall establish, implement and maintain a procedure(s) to monitor and measure, on a regular basis, the key characteristics of its operations that can have a significant Environmental and Stewardship Impact. The procedure(s) shall include the documenting of information to monitor performance, applicable operational controls, and conformity with the Organization's environmental, health and safety, and data security objectives and targets.*





The Organization shall ensure that Industrial Hygiene samples are analyzed by an ISO 17025 certified laboratory or by a nationally accredited laboratory that is capable of testing for the necessary constituents.

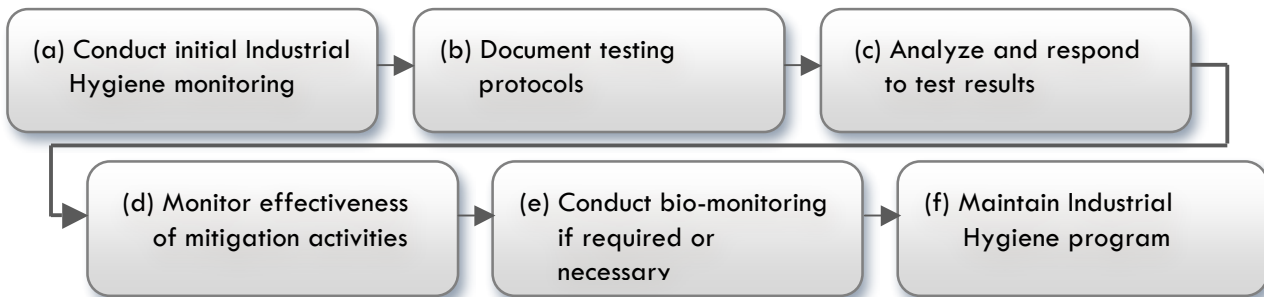
*The Organization shall ensure that calibrated or verified monitoring and measurement equipment is used and maintained and shall retain associated records.*

#### 4.5.1.1 Environmental, health, and safety incident monitoring and reporting

The Organization shall establish and maintain a process for internal reporting of events including a summary log and up-to-date and accurate records of all environmental releases, health and safety accidents, incidents, injuries, exposures, and near misses.

#### 4.5.1.2 Additional Industrial Hygiene monitoring for Organizations using Potentially Hazardous Processing Technologies (PHPTs)

Organizations using one or more PHPTs shall establish, implement, and maintain a documented Industrial Hygiene monitoring program to reduce or eliminate workplace hazards and exposures to hazardous materials, protect worker health and safety rights, maximize injury and illness protection, and ensure that operational controls (4.4.6.1) are adequate, including:



The requirements for each of these steps are as follows:

##### a) Conduct initial Industrial Hygiene monitoring

Conduct and document Industrial Hygiene monitoring twice in the first year, at least four months apart, in all areas where Potentially Hazardous Processing Technologies are located and in use, under maximum operating conditions, and in any areas where hazards could be present or likely to develop or migrate. The Organization shall mitigate problems according to requirements in 4.4.6.1. This monitoring shall be conducted by a Certified Industrial Hygienist or Equivalent, and shall include:

1. Noise monitoring in areas where workers may be exposed to excessive noise, including operation of balers and shredders, using technology (such as noise dosimetry equipment) that incorporates impact, continuous and intermittent noise sources so the noise risk assessment (4.3.1) accurately relates to the workers' ongoing workday exposures,
2. Airborne hazards, including worker breathing zones, for both the operators of PHPTs and those working where exposure may occur, to ensure lack of migration of airborne hazards. The Organization shall monitor specific airborne hazards in accordance with requirements in Appendix A.4.5.1.2 a) 2,

NOTE: In response to information emerging at the time of publishing this Standard regarding the inadequacy of air monitoring alone to determine actual exposures, this Standard will likely add requirements (via a sanctioned interpretation, for additional testing (e.g., for lead, for bio-monitoring of some workers, and/or surface sampling) and reporting test results. The purpose of these changes is to



collect data, better understand risks associated with specific types of operations in the electronics recycling/refurbishment industry, and further revise this Standard based on analysis of data. Organizations are urged to immediately apply best management practices. See Guidance Document for best management practices regarding additional initial and ongoing testing, until it becomes a requirement in this Standard.

b) Document testing/monitoring protocols

Maintain thorough written documentation of both initial and ongoing [4.5.1.2.a) and f)] monitoring protocols and activities,

c) Analyze and respond to test results

Ensure a Certified Industrial Hygienist or Equivalent and/or a physician (knowledgeable in occupational medicine and/or medical toxicology) analyzes monitoring results (4.5.1, 4.5.1.1, and 4.5.1.2), including calculating time weighted averages, by comparing the test results to the most stringent (protective) regulatory exposure limits within the Organization's jurisdiction,

d) Monitor and ensure effectiveness of mitigation activities and controls, and impacts of significant changes

Utilizing these test results, the comparison with regulatory limits, and requirements in 4.4.6.1 a), establish or take action to create or improve operational controls (4.4.6.1), take corrective and preventive actions (4.5.3), and update and/or improve the risk assessment [4.3.1 c)], responding quickly to test results of concern (i.e. mitigating). Determine that mitigation activities and controls are effective in reducing or eliminating exposures and preventing adverse health effects, and that impacts of significant changes involving PHPTs (e.g. installation of a new shredder) meet requirements in this Standard, including retest mitigated activities, areas of concern, and significant changes as soon as possible, but no longer than 6 months following mitigation efforts and/or significant PHPT changes,

e) Determine medical surveillance needs and conduct biological-monitoring if required

The Organization shall have a designated occupational health provider (i.e. an occupational health physician or occupational health nurse, or occupational physicians' clinic) who is available for medical surveillance (biological monitoring) of workers if the Organization is using one or more PHPTs, for workers that consent. The Organization shall:

1. Determine that biological-monitoring is needed if:

- ▶ Recommended by the occupational health provider who shall be provided with the results of the risk assessment (4.3.1.c),
- ▶ Representative<sup>58</sup> Industrial Hygiene exposure data indicates regulatory occupational exposure limits have been exceeded or workers are engaged in high exposure tasks,
- ▶ Recommended by the Certified Industrial Hygienist or Equivalent, or
- ▶ Requested by the occupational and environmental health and safety team (4.4.3.1.a) 4) or any worker concerned about their potential exposures, and if agreed by the occupational health provider,

<sup>58</sup> For example, take at least 3 personal samples for each unique task, under full capacity scenarios, and make decisions based on the 95th percentile results. The accuracy of the monitoring and analysis used should have accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of the substance equal to or greater than the occupational exposure limit.



2. Develop, document, and implement a medical surveillance program, if needed, as determined in 1 above, in consultation with the Certified Industrial Hygienist or Equivalent. The occupational physician shall decide upon the medical issues, but these decisions may be carried out by an occupational health nurse or physician's assistant. This medical surveillance program shall:
  - ▶ Be conducted for all workers whose representative Industrial Hygiene exposure data indicates the occupational exposure limits have been exceeded,
  - ▶ Be based on generally accepted methods and regulatory requirements,
  - ▶ Inform the physician with written documentation of pertinent activities performed, work practices, materials handled, exposure controls, personal protective equipment used, air monitoring results, and any prior worker test results,
  - ▶ Specify frequency of biological testing, medical exams, and conditions where workers are removed or returned to work,
  - ▶ Include worker baseline examinations and specify when follow up medical evaluations are required,
  - ▶ Be provided without cost to affected or potentially affected workers, and in cooperation with affected workers, and
  - ▶ Entitle workers to a second medical opinion for occupational exposures, injuries or illness, within reasonable costs,
3. Ensure laboratory analyses are performed by an ISO 17025 certified laboratory or a nationally accredited laboratory, and
4. Require in writing that the occupational health provider maintains the confidentiality of all workers' non-work-related medical issues by only revealing to the Organization information specifically related to the workers' workplace exposures/hazards, and

f) Update & maintain the ongoing occupational health & safety and Industrial Hygiene program

The Organization shall update and maintain the ongoing occupational health & safety and Industrial Hygiene monitoring program with the Certified Industrial Hygienist or Equivalent to:

1. Identify activities and locations to be retested by reviewing the:
  - ▶ Significant Environmental and Stewardship Aspects identified in the risk assessment [4.3.1 c) & d)],
  - ▶ Results of the initial (4.5.1.2.a) and ongoing (4.5.1.2.d) Industrial Hygiene monitoring,
  - ▶ Proposed and actual significant changes, and
  - ▶ Effectiveness of operational controls (4.4.6.1), and
2. Create and implement a schedule for ongoing monitoring, under worst-case scenario operations, of significant Environmental and Stewardship Aspects, based on the results of 4.5.1.2 d) above. The schedule shall also include:
  - ▶ Monitoring of other areas or contaminants recommended by the Certified Industrial Hygienist or Equivalent and/or the physician and if needed, other health and safety experts,
  - ▶ Noise monitoring as required in 4.5.1.2.a) 1, and



- ▶ Monitoring of airborne hazards, based on testing frequencies required in Appendix A.4.5.1.2.e) 2.

#### 4.5.1.3 Track Electronic Equipment

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An Organization shall implement and maintain a documented system for tracking all Electronic Equipment entering and exiting their facility(s) and under their Control. The Organization shall:

a) Track all Electronic Equipment

Establish, document, and implement an effective system for tracking and documenting all Electronic Equipment coming into and going out of the Organization's facility and/or Control, and in accordance with requirements in 4.4.6.5 (Downstream Accountability), including materials managed and destined for reuse, Recycling, and disposal, and those managed by their Ancillary Sites. Even in jurisdictions where the e-Stewards Organization has no control over where or how some of their e-Waste is processed, due to laws, these volumes shall still be accounted for in their tracking and materials balance accounting,

b) Implement material balance accounting

Perform and calculate a documented material balance accounting at least every six months for all Electronic Equipment coming into and going out of the Organization's facility and Control, as well as in inventory<sup>59</sup>, reconciling incoming quantities with outgoing quantities, and

c) Link material balance accounting with Shipping Records to downstream vendors

For all Electronic Equipment destined for reuse, HEWs, and PCMs, ensure that the tracking system [a] above] links outgoing quantities documented in each material balance accounting period [b] above] with corresponding subsequent outgoing Shipping Records [4.4.6.5 c) 3] for those same quantities of respective materials, including their corresponding acknowledgments of receipt and Processing (or equivalent) which confirm they have been managed by approved Immediate Downstream Processor(s), with or without Intermediaries involved.

#### 4.5.1.4 Report to e-Stewards database

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Prior to initial certification, and by January 31<sup>st</sup> of every subsequent year, the Organization shall provide the following data, in English language, for each calendar year<sup>60</sup> to the confidential<sup>61</sup> e-Stewards database by uploading it to <https://apps.e-stewards.org/database> regarding all Electronic Equipment entering their facility(s) and/or under their Control (including associated Ancillary Sites):

- a) Address (including country) for primary location(s), and a description of the site,
- b) The number of individuals who worked for more than one month during the twelve month period, including:

- 1. Full time (equivalent<sup>62</sup>) employees,

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<sup>59</sup> i.e. equipment and components currently being managed and/or stored in-house or under the Organization's Control

<sup>60</sup> January 1<sup>st</sup> through December 31<sup>st</sup>. For the initial certification only, the Organization may provide less than a full year of data. In this case, data must be provided from the period of time between when the Organization contracted for initial certification and when they accomplished their Stage One audit, and must include at least three consecutive months of data.

<sup>61</sup> The e-Stewards program will only publicly report this data in the aggregate. Information from individual Organizations will not be shared in a manner that identifies the Organization, unless the e-Stewards Organization agrees in writing to allow such identification. Except for the names of data entry personnel, this data shall exclude individual names, identifiers, or personal information that could violate laws, or the privacy of people and Organizations.

<sup>62</sup> Combine part time hours worked by all part time workers and calculate how many full time jobs are equivalent.



2. Full time (equivalent) contract workers, and
  3. Volunteers,
- c) Description of all Processes taking place at each site, such as:
1. De-manufacturing of e-Waste for Materials Recovery and/or Final Disposal, in one of more of the following categories:
    - ▶ Manual disassembly,
    - ▶ Shredding or other mechanical size reduction and separation, and/or
    - ▶ Other (define),
  2. Asset recovery, Repair/Refurbishment for reuse,
  3. Metals refining,
  4. Plastics recovery, and/or
  5. Other (define), and
- d) Total weight (or unit count) of Electronic Equipment, components, and materials Processed, in inventory, and under Organizational Control.

#### 4.5.2 Evaluation of compliance

##### 4.5.2.1 Evaluation of legal requirements

*Consistent with its commitment to compliance, the Organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements.*

*The Organization shall keep records of the results of the periodic evaluations.*

##### 4.5.2.2 Evaluation of other requirements

*The Organization shall evaluate compliance with other requirements to which it subscribes. The Organization may wish to combine this evaluation with the evaluation of legal compliance referred to in 4.5.2.1 or to establish a separate procedure(s).*

*The Organization shall keep records of the results of the periodic evaluations.*

#### 4.5.3 Nonconformity, corrective action and preventive action

*The Organization shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action. The procedure(s) shall define requirements for*

- a) *identifying and correcting nonconformity(ies) and taking action(s) to mitigate their Environmental and Stewardship Impacts, and any other non-conformities relating to the implementation of this Standard and the Organization's Environmental Management System,*
- b) *investigating nonconformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence,*
- c) *evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence,*
- d) *recording the results of corrective action(s) and preventive action(s) taken, and*



e) *reviewing the effectiveness of corrective action(s) and preventive action(s) taken, and*

*Actions taken shall be appropriate to the magnitude of the problems and the environmental, occupational health and safety, and data security impacts encountered.*

*The Organization shall ensure that any necessary changes are made to Environmental Management System documentation.*

#### 4.5.4 Control of records

*The Organization shall establish and maintain records as necessary to demonstrate conformity to the requirements of its Environmental Management System, of the e-Stewards Standard, and of this International Standard, and the results achieved.*

*The Organization shall establish, implement and maintain a procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records.*

*Records shall be and remain legible, identifiable and traceable.*

##### 4.5.4.1 Records retention

*The Organization shall retain all records required by this Standard for a minimum of 5 years with the exception of workplace and worker exposure records, which shall be retained for the length of each worker's employment plus 30 years.*

#### 4.5.5 Internal audit

*The Organization shall ensure that internal audits of the Environmental Management System are conducted at planned intervals, at least Annually, to*

a) *determine whether the Environmental Management System*

1. *conforms to planned arrangements for environmental, occupational health and safety, and data security management including the requirements of this International Standard and e-Stewards Standard, and*
2. *has been properly implemented and is maintained, and*

b) *provide information on the results of audits to management.*

*Audit programme(s) shall be planned, established, implemented and maintained by the Organization, taking into consideration the environmental, occupational health and safety, and data security importance of the operation(s) concerned and the results of previous audits.*

*Audit procedure(s) shall be established, implemented and maintained that address*

- *the responsibilities and requirements for planning and conducting audits, reporting results and retaining associated records,*
- *the determination of audit criteria, scope, frequency and methods.*

*Selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process.*

#### 4.6 Management review

*Top management shall review the Organization's Environmental Management System, at planned intervals, and at least Annually, to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the Environmental*



*Management System, including the environmental policy and environmental, occupational health and safety, and data security objectives and targets. Records of the management reviews shall be retained.*

*Input to management reviews shall include*

- a) results of internal audits and evaluations of compliance with legal requirements and with other requirements to which the Organization subscribes,*
- b) communication(s) from external interested parties, including complaints,*
- c) the environmental, occupational health and safety, and data security performance of the Organization,*
- d) the extent to which objectives and targets have been met,*
- e) status of corrective and preventive actions,*
- f) follow-up actions from previous management reviews,*
- g) changing circumstances, including developments in legal and other requirements related to its Environmental and Stewardship Aspects, and*
- h) recommendations for improvement.*

*The outputs from management reviews shall include any decisions and actions related to possible changes to environmental policy, environmental, occupational health and safety, and data security objectives, targets and other elements of the Environmental Management System, consistent with the commitment to continual improvement.*



## APPENDIX A: REQUIREMENTS FOR ALL e-STEWARDS ORGANIZATIONS

### A.4.4.6.5. Downstream Accountability

- a) Establish and maintain an up-to-date downstream disposition chart of HEWs and PCMs

The downstream disposition chart shall provide the following up-to-date information for the entire Recycling Chain for each PCM and HEW (including HEW residuals, e.g. hazardous slag and filter residues, CRT Processing residuals), documenting the chain of all Downstream Processors, End Refurbishers, Brokers, End Processors, and Final Disposal facilities used throughout the Recycling Chain for each material, including:

1. Current company/entity name, contact information, address of physical location of facility and office (including country), and type of operation, and
2. Identification of downstream certified e-Stewards Organizations,

- b) (No additional requirements)

- c) Conduct ongoing Due Diligence on all Immediate Downstream Processors (IDPs), and ensure and track responsible management by IDPs managing each HEW

The Organization's system of controls for all HEWs and their HEW residuals shall begin with their own material balance accounting and corresponding outgoing shipments (see 4.5.1.3 c) to approved IDP facilities, including End Refurbishers, and shall include the following:

1. Evaluate, perform on-site audits, and approve each IDP, including:
  - i. At least Annually, and whenever changes in vendors and/or Brokers are made, determine that each IDP has the in-house technical capability, operational capacity (including controls), and willingness to further Process and/or dispose of HEWs in a manner that effectively meets the Organization's obligations for HEWs and in accordance with the IDP's legal requirements, as well as 4.2 b), 4.3.2.1 (Legal Exports and Imports), the Organization's plan for materials (4.3.4), 4.4.6.2 (Reuse) and 4.4.6.3 (Data Security) if applicable, 4.4.6.4 (Management of EE), 4.4.6.5 (Downstream Accountability), 4.4.6.6 (Final Disposition), and 4.4.6.7 (Export & Import Controls),
  - ii. Ensure that each IDP maintains and provides to the Organization ongoing records of the IDP receiving and Processing the Organization's HEWs, as well as random sampling of downstream Shipping Records, including acknowledgements of receipt and Processing (see A.4.4.6.5 d) 2),
  - iii. Create and enforce written agreements with each IDP, and renew Annually, to restrict, and control the Organization's HEWs according to requirements in section 4.4.6.5. This agreement shall include a requirement for each IDP to immediately (within 5 business days) notify the Organization if any of the IDP's Downstream Processors or Brokers change,
  - iv. Annually perform Due Diligence, and determine, via objective evidence, that all IDPs have valid and current business licenses, process and facility permits, control permits, and import permits, as applicable, to properly manage the Organization's materials, and that they have adequate insurance and site closure plans, appropriate to the scope and scale of their operations and potential remediation costs. Verify the





- accuracy and adequacy of information obtained, and determine if each IDP has had regulatory violations, fines, and/or related enforcement actions in the past 5 years,
- v. Verify with documented evidence that each IDP either:
    - ▶ Has a current and accredited certified environmental health and safety management system (EHSMS), or
    - ▶ Fully implements, Annually reviews, and updates as needed a documented management system for: identifying and complying with legal requirements; identifying and effectively responding to environmental, health, and safety risks; and continually evaluating and improving that system and their operations accordingly,  
Ensure this management system effectively implements environmental, health & safety procedures, controls, and monitoring to prevent exposure and releases to toxics such as lead, mercury, and cadmium,
  - vi. If the IDP is an End Refurbisher, confirm on an ongoing basis and at least Annually that all of the outsourced reuse tasks conducted by the End Refurbisher(s) are effectively implemented and completed in-house, in conformity with 4.4.6.2 (Reuse) & 4.4.6.3 (Data Security), and
  - vii. Determine that transport companies used by IDPs have adequate financial guaranty to cover costs in the event of an accident or error,
2. Ensure that each IDP for each HEW has an effective system of controls to restrict and document downstream destinations of HEWs to approved facilities only, throughout the Recycling Chain, including when Brokers and other Intermediaries are used, in conformity with A.4.4.6.5 d) below. The Organization's system of controls and ongoing Due Diligence shall include:
- i. At least every 2 years, and whenever changes in vendors and/or Brokers are made, visually inspect and create a detailed written report confirming work agreements between each IDP and their next tier downstream vendors that stipulate how the entities downstream of the IDP meet the Organization's obligations in 4.4.6.6 (Final Disposition) and 4.4.6.7 (Export), including when Brokers are involved,
  - ii. Annually obtain from each IDP the company name, contact information, facility and office address (physical location, including country), and type of operation for each Downstream Processor, Broker, and Final Disposal facility for each HEW and HEW by-products, and
  - iii. Ensure that when Intermediaries (such as Brokers) are used, they restrict the transfer of HEWs only to Downstream Processor(s) and/or Final Disposal facilities approved by the Organization, and
- d) Conduct ongoing Due Diligence to ensure responsible management of HEWs beyond IDPs, throughout the Recycling Chain

At least Annually, and whenever changes in vendors and/or Brokers are made, evaluate and approve Downstream Processors & Final Disposal facilities beyond the IDPs, throughout the Recycling Chain, to ensure they operate in conformity with applicable legal requirements, 4.2.b) (Policy), 4.3.2.1 (Legal Exports), 4.4.6.4 (Management of EE), 4.4.6.5 (Downstream Accountability), 4.4.6.6 (Final Disposition), and 4.4.6.7 (Export), as well as the following requirements:

1. Verify business relationships downstream

Know & track HEW outputs to Final Disposition: Identify Process outputs from each facility that meet the e-Stewards definition of HEWs, and track and restrict these to Final Disposition as

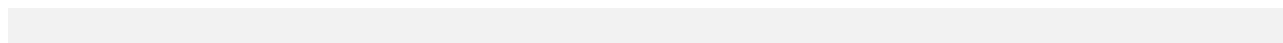


required in this Standard. Obtain from each Downstream Processor the company name, contact information, facility and office address (physical location, including country), and type of operation for each Downstream Processor, Brokers involved, and Final Disposal facility for each HEW and their HEW by-products,

2. Confirm ongoing materials flow & records

Random sampling of shipping records: Annually obtain copies<sup>63</sup> (or visually inspect and create a detailed written report) of a sampling of a minimum of 3 randomly chosen months of outgoing Shipping Records from each Downstream Processor for each HEW throughout the Recycling Chain and compare with corresponding acknowledgements of receipt from next tier vendors, to ensure that shipments of HEWs have been transferred to and received by approved facilities in conformity with 4.4.6.6 (Final Disposition), and 4.4.6.7 (Export), including when Brokers are involved, and

3. Ensure Downstream Processors have an environmental health & safety management system:  
[no additional requirements].



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<sup>63</sup> Copies may be obtained directly from each Downstream Processor or via the Organization's Downstream Processors, but visual inspection of records shall be done by the Organization directly.



A.4.4.6.7 b)

## e-Stewards Declaration

### *of Testing, Determination of Full Functionality, and Reuse Destination of Exported Used Electronic Equipment & Components in this Shipment*

EXPORT INFORMATION	
Holder who arranges the transboundary movement (responsible for testing)	
Company name:	Contact name:
e-mail:	Phone:
Address:	Country:
Company responsible for evidence of functionality (if different than Holder)	
Company name:	Contact name:
e-mail:	Phone:
Address:	Country:
International Carrier	
Company name:	Contact name:
e-mail:	Phone:
Address:	Country:

IMPORT INFORMATION	
Importer	
Company name:	Contact name:
e-mail:	Phone:
Address:	Country:
User, Retailer, Distributor (if different than Importer)	
Company name:	Contact name:
E-mail:	Phone:
Address:	Country:

DECLARATION				
I, the holder of the Electronic Equipment listed below, hereby declare that prior to export the used equipment/components in this shipment, listed below, were tested and determined to be in good working condition and Fully Functional.* I also confirm that this equipment is being imported for the purpose of Direct Reuse** and not for repair, recycling, or Final Disposal.	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%; padding: 5px;">Name:</td> </tr> <tr> <td style="padding: 5px;">Signature:</td> </tr> <tr> <td style="padding: 5px;">Date:</td> </tr> </table>	Name:	Signature:	Date:
Name:				
Signature:				
Date:				

\* **Fully Functional:** Electronic Equipment and/or components are "Fully Functional" when they are tested and demonstrated to meet or exceed the original functionality specifications for the product/component's Essential Functions, or if upgraded, the intended new specifications; are safe for use & handling, without electrical, physical, or fire hazards; do not contain any Hazardous Electronic Equipment which is non-functional (such as non-working circuit boards, mercury-containing devices, batteries, or CRTs), and which





A.4.5.1.2 a) 2: Airborne hazards – Requirements for Testing

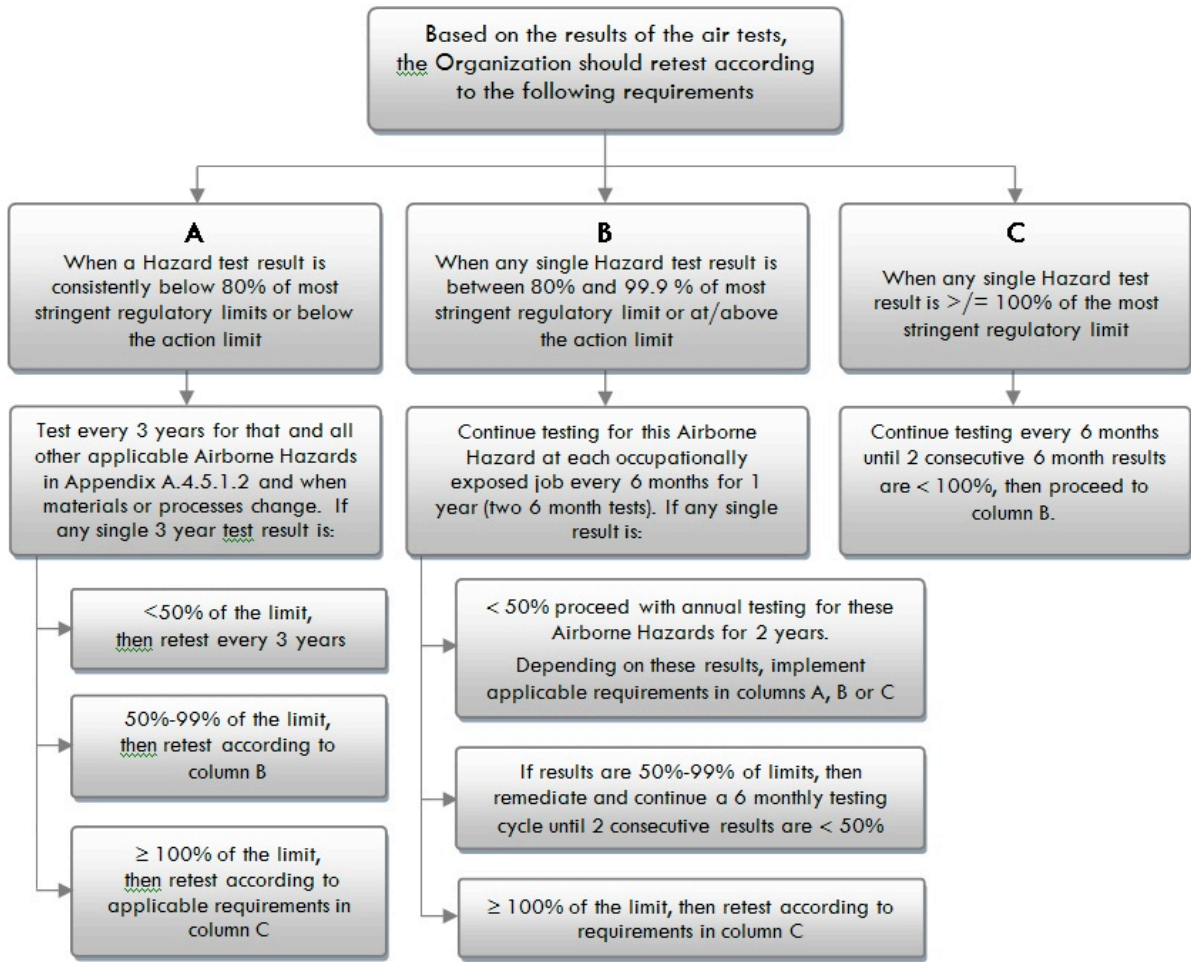
If an Organization is performing the following PHPT operations...	...then it shall perform and document Industrial Hygiene tests for the following airborne hazards:
Breaking, cutting, crushing, shredding, or pulverizing devices with cathode ray tubes, (such as CRT monitors and TVs), regardless of technologies or containment controls:	▶ Lead, cadmium, and compounds containing these heavy metals, Phosphors, and crystalline silica dust
Processing, removal, replacement, and/or disposal of mercury-containing components (such as fluorescent lamps in LCD screens):	▶ Mercury and mercury compounds, including in worker breath zones and areas around and on the floor below the mercury-removal and storage areas
Using power machinery to shred, cut, break, pulverize, crack, crush, bale, or chip Hazardous Electronic Equipment or Problematic Components and Materials which may contain these hazardous substances:	▶ Lead, beryllium, cadmium, asbestos, mercury, including compounds of these. If an Organization can demonstrate that the material being Processed and the Processing technology or its by-products do NOT contain one or more of these constituents, and can provide documented evidence of this fact <sup>64</sup> , then they do not need to continue to test for the constituent, unless the material being Processed or the Processing technology changes.
Only using a shredder dedicated to hard drives (which contain circuit boards), but not using any other shredding or mechanical size reduction:	▶ Lead, beryllium, cadmium, including compounds of these, as well as fiberglass
Baling and/or shredding separated circuit boards:	▶ Lead, beryllium, fiberglass
Using thermal processes for melting, smelting, or combustion of Electronic Equipment:	▶ Inhalable hydrocarbons (including polycyclic aromatic hydrocarbons), and the elements beryllium, lead, mercury, and cadmium and all compounds of these elements. If it can be shown that the material being Processed and the Processing technology or its by-products do NOT contain one or more of these constituents, and can provide documented evidence of this fact <sup>65</sup> , then they do not need to continue to test for the constituent, unless the material being Processed or the Processing technology changes.
Using acids or solvents for precious metals or plastics Materials Recovery, or cleaning procedures:	▶ Workplace exposure tests for any acid or solvent that is indicated as an inhalation hazard in the relevant MSDSs, as well as related digestive acid gases such as hydrogen sulfide, nitrous oxide, and other identified chemical hazards.

<sup>64</sup> For example, due to the Organization's restrictions on acceptance of certain materials and TCLP results indicating the incoming waste stream does not contain specific toxics, an Organization may provide objective evidence that testing is not necessary, at least under certain circumstances.

<sup>65</sup> *ibid*



A.4.5.1.2 f) 2. Testing frequencies for monitoring (retesting) of airborne hazards (Reference to regulatory limits or action levels below may include use of ACGIH TLVs as described in 4.4.6.1 a).



END OF APPENDIX A



## APPENDIX B: ADMINISTRATIVE REQUIREMENTS FOR e-STEWARDS ORGANIZATIONS

The following requirements are applicable to all e-Stewards Organizations, in accordance with the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment: Version 2.0©

### a) General

e-Stewards certification is a voluntary, third-party certification system available to recyclers of electronic equipment globally (see 1.1.3 and 1.1.4). Only Organizations that have been audited by specially-trained and qualified auditors who are employed by accredited e-Stewards Certification Bodies and determined to conform to the e-Stewards Standard, and have signed a license agreement with the e-Stewards program administrator may be recognized as certified e-Stewards recyclers.

### b) Scope of Certification

Corporate certification, within one country: The e-Stewards certification program requires certification of all Recycling facilities located within one country and owned (fully owned or owning a controlling interest) by an individual, corporate, organizational, or government entity. While individual Recycling facilities (Processing sites) may receive a site certification, all multi-sited e-Stewards entities shall eventually possess e-Stewards certification for all its eligible Recycling sites held within the entity(s), as well as all its electronics Recycling subsidiaries, regardless of brand, in order to be considered a licensed and valid certified e-Stewards entity. It is not a requirement that a parent company of a certified e-Stewards entity become certified, nor is it a requirement that any other subsidiaries owned by that parent become certified. However, if a certified e-Stewards entity owns another subsidiary that Processes or Controls Electronic Equipment, all subsidiary sites within the same country must also become e-Stewards certified concurrent with or subsequent to the e-Stewards parent company's certification, within 18 months of the initial site certification, irrespective of brand names used by entities. The rules [paragraph e) below] for "use of logo" shall always apply.

Ancillary Sites: When an Organization owns or Controls Ancillary Sites (e.g., collection sites, warehouses, or other non-Processing sites), each Ancillary Site shall be included in the scope of the Environmental Management System of the associated Recycling facility. Certification Bodies (CB's) do not, however, have to conduct on-site audits of Ancillary Sites, but may choose to in order to increase confidence of conformity to applicable requirements.

The certified e-Stewards Organization shall assure through its internal processes that the applicable elements of the environmental health and safety management system have been implemented at each Ancillary Site. When auditing a Recycling facility, the CB shall confirm that the applicable elements of the Standard are implemented and maintained as they apply to corresponding Ancillary Sites, including but not necessarily limited to internal auditing, material balance accounting, safety training, and downstream accountability.

Separate electronics Recycling companies with same ownership: If the top management or owner(s) of an e-Stewards entity also own or own a controlling interest in a separate electronics Recycling entity, all of these Recycling facilities are also required to become e-Stewards certified, regardless of brand names used by the entities, but the rules [paragraph e) below] for "use of logo" shall always apply.



Co-location: While it is permissible that a certified e-Stewards recycler is co-located with other entities, the e-Stewards recycler shall be responsible for controlling their operations in conformity with the Standard, including impacts of their operations upon co-located entities' areas. Additionally, a co-located e-Stewards Organization shall assure that their own workers, visitors, and customers on-site are protected against health and safety hazards caused by co-located entities.

c) Application to Certification Bodies (CB)

Only Certification Bodies which have been accredited under the ANAB e-Stewards® Program or another accreditation program approved by the e-Stewards program administrator are eligible to certify e-Stewards Organizations within the e-Stewards certification program. Unaccredited certificates are not permitted.

An e-Stewards applicant that meets the scope and eligibility requirements of this Standard may apply to any of the approved and accredited CB's that are listed in the [www.e-Stewards.org](http://www.e-Stewards.org) website. When completing the application, the CB will request and the applicant shall provide information necessary to properly document and determine the required time to conduct the certification audits, including information as follows:

4. Has applicant disclosed all Recycling facilities and all Ancillary Sites that are located within the country?
5. Has applicant disclosed all activities being performed at all Ancillary Sites (Ancillary Sites may not perform any Recycling activities, as defined)?
6. Has applicant disclosed all subsidiary Recycling sites that are fully or majority owned by the same owner(s)?
7. Has applicant disclosed all other separate Recycling companies/entities that are fully or majority owned by the same owner(s) or top management?
8. Are data destruction services provided by the applicant? Describe.
9. What Potentially Hazardous Processing Technologies are employed (e.g. shredding, crushing, thermal or chemical processes, etc.)?
10. Has the applicant provided an accurate, up-to-date description or diagram indicating the extent of the Recycling Chain that begins with the applicant e-Stewards Organization and ends with Final Disposition of all Hazardous Electronic Waste, Problematic Components and Materials, and/or equipment/components going for reuse, which originated from the Organization's facility and/or Control?
11. Describe any exportation of Hazardous Electronic Waste and Electronic Equipment, directly or indirectly (e.g. through Downstream Processors or Intermediaries), including Electronic Equipment going for reuse, Recycling, and Final Disposal.
12. Is the applicant currently ISO 14001: 2004 certified by any ANAB-accredited CB, or a CB accredited by another accreditation body approved by the e-Stewards program administrator?
13. Is the applicant currently BS OHSAS 18001 certified?





d) Contracting with a CB

Once a CB has been selected, the e-Stewards applicant will be required to enter into a three-year contract, at a minimum, for audit and certification services covering all required sites to be certified within a given country. This contract shall include a surveillance plan requiring a series of routine surveillance audits which shall be conducted at least annually, but may be conducted more frequently. The applicant and CB shall agree upon the surveillance frequency that best meets the needs of the Organization and the CB's needs to assure conformity to the Standard. Surveillance audits may be announced or unannounced, and may be witnessed by BAN and/or its designated program administrator.

When the Organization to be certified consists of more than one site, it is required that the Organization contracts for the certification of all sites which are eligible and located in the same country. The Organization may elect to certify all sites at one time, or to certify them sequentially. However, all sites required to be certified shall be certified within 18 months of the initial certificate issuance. An Organization that fails to certify all of its required sites within 18 months shall have its certifications suspended or withdrawn. No sampling is permitted for auditing of multi-sited Organizations for the initial certification, but approved sampling methods may be permitted, as approved by the Certification Body, during the surveillance and re-certification stages.

If an eligible new site is opened or acquired after initial site certification, that site must be certified within 18 months of its opening or acquisition.

e) Certification and Use of Logo

When the CB has concluded and confirmed that all certification requirements are met, they must notify the program administrator who will then enter into a license agreement with the Organization. Only after a license agreement is signed can an e-Stewards certificate be issued by the CB. No delivery or announcement of certification shall be made until the certificate is issued. A Marketing and License Fee applies.

An Organization may only claim to meet this Standard and/or be a certified e-Stewards Organization if the Organization is both:

- ▶ Licensed to use the e-Stewards name and logo by BAN or the e-Stewards program administrator, and
- ▶ Currently certified by an e-Stewards accredited Certification Body.

The Basel Action Network (BAN) retains ownership of this Standard and its use. BAN may license a separate e-Stewards program administrator to manage and oversee the e-Stewards Standard and certification program on its behalf. Any individual, Organization, or entity utilizing the e-Stewards Standard, name, or logo for any commercial purpose or purposes other than reference are required to enter into a license agreement with the Basel Action Network, or the e-Stewards program administrator as required.

The e-Stewards name and logo are trademarked and the Standard is copyright protected by the Basel Action Network. Rules for the use of the logo are described in the e-Stewards Marketing and Licensing Agreement, which must be signed and executed before certification can be finalized.



Any proclamation of self-certification or self-declaration of conformity, or second party certification or declaration of conformity, to this Standard is strictly prohibited. Misrepresentation of the scope of certification may result in suspension or withdrawal of the certificate.

Any unauthorized use of the e-Stewards Standard (i.e. without written permission or under license), all or in part, is strictly prohibited.

f) Significant Changes Following Certification

The Organization shall make their CB aware of any significant changes to ownership, management, facilities, number of workers, Processing methods, emergencies, or other significant changes that may impact ongoing conformance with the Standard, within 14 business days of the change(s) or less if required by their CB. The Organization shall permit the CB to conduct an evaluation of the reported changes and their effects on conformance, including special on-site surveillance audits, as necessary.

g) Critical Non-Conformities

Certified e-Stewards recyclers and those which have contracted for certification are subject to the formal “Critical Non-Conformity Policy” which may impose sanctions upon e-Stewards Organizations when and if objective evidence is established of egregious and/or dishonest practices which could bring disrepute upon the e-Stewards certification program. The Policy addresses non-conformities above and beyond the typical minor or major non-conformities that may be raised from time-to-time by the CB auditor during initial, surveillance, or re-certification audits of the Environmental Management System. The Critical Non-Conformity Policy, including the e-Stewards appeals process, is located on the website at [www.e-Stewards.org/cncpolicy](http://www.e-Stewards.org/cncpolicy).

h) Oversight by e-Stewards Program Administrator

An Organization shall permit any reasonable level of oversight by the e-Stewards program administrator, or a third party designated by them, of any and all audit and certification activities, including records providing evidence of such. This shall include the program administrator witnessing some onsite audits. Findings shall normally not be released to any third party. However, in cases involving a Critical Non-Conformity raised by the e-Stewards program administrator, evidence of Critical Non-Conformities may be used in any way that protects the e-Stewards Certification Program and program administrator.

i) Data Reporting Requirements

The e-Stewards Standard requires that the e-Stewards Organization reports selected informational and performance data to the e-Stewards database (<https://apps.e-stewards.org/database>) prior to Certification and on a regular basis as defined in the Standard. The Organization shall inform their CB of the person(s) responsible for uploading this data.

END OF APPENDIX B



## APPENDIX C: REQUIREMENTS FOR e-STEWARDS CERTIFICATION BODIES AND ACCREDITATION BODIES

The following requirements are applicable to qualified accreditation bodies (AB's) and certification bodies (CB's) which are performing audits and certifying e-Stewards recyclers in accordance with the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment©, including the latest version of the corresponding Sanctioned Interpretations of the Standard. It is noted that the requirements of the e-Stewards Standard may be altered by the issuance of Sanctioned Interpretations by the e-Stewards program administrator between official versions of the Standard. During transition periods between versions of the Standard, each Standard version may have a unique set of Sanctioned Interpretations applicable. These are posted on the e-Stewards website and shall be binding upon AB's, CB's, and e-Stewards Organizations at all stages.

### a) Accreditation of Certification Bodies

Only CB's which have been accredited under the ANAB e-Stewards® Program or another accreditation program approved by the e-Stewards program administrator are eligible to participate in the e-Stewards certification program.

Interested CB's shall first submit a pre-application to the e-Stewards program administrator and be pre-approved in accordance with the e-Stewards CB pre-approval criteria before the application to any qualified e-Stewards Accreditation Body is made. An application fee shall apply.

The e-Stewards program administrator requires that any CB operating within the e-Stewards certification program must demonstrate initial and ongoing satisfactory performance. Satisfactory performance is defined by both adherence to e-Stewards AB rules and the e-Stewards Critical Non-Conformity Policy, as well as additional performance measures defined by the e-Stewards program administrator as documented in this Appendix and the current e-Stewards Sanctioned Interpretations. The following are likely to constitute unsatisfactory performance:

1. The CB is not current with any licensing fees required by the e-Stewards program administrator;
2. The CB fails to report certification data as required by Appendix C, paragraph h) of the e-Stewards Standard within 5 business days of initial certification or any certification status changes;
3. The CB has been suspended by an AB approved by the e-Stewards program administrator for non-conformance with ISO 14001 or any industry specific standard (e.g., TL 9000, AS9001) more than once within three years;
4. The e-Stewards CB has been suspended by an AB approved by the e-Stewards program administrator for non-conformance with the e-Stewards program requirements; and/or
5. The CB has operated in any other manner which, at the sole discretion of program administrator's executive management, could bring disrepute to the e-Stewards certification program or the e-Stewards program administrator.

The e-Stewards program administrator will consider the implications of any evidence of unsatisfactory performance, and will make its judgment for action based upon these implications. Corrective action by the CB may be required by the e-Stewards program administrator. Failure to



demonstrate satisfactory performance and/or failure to implement effective required corrective actions may suspend a CB's right to participate in the e-Stewards program for up to three years following the infraction.

The suspension action and duration of suspension will be determined solely at the e-Stewards program administrator's discretion, and there shall be no refund of any application or licensing fees collected.

b) Copyrights

Accredited e-Stewards CB's will be granted the right to use the e-Stewards® mark and Standard(s) in conjunction with their marketing and certification programs. CB's shall be required to sign a Licensing Agreement with the e-Stewards program administrator that controls the use of the e-Stewards registered logo and trademark. A licensing fee is applicable, levied upon accredited CB's in accordance with the program administrator's license fee structure.

Participating CB's shall strictly observe the copyright restrictions related to the e-Stewards Standard(s), which are described inside the title page of this Standard, and the copyrighted restrictions related to the e-Stewards mark, which are described in program administrator's licensing agreement.

The CB shall protect the e-Stewards mark and name from misuse by the CB and by any of its certified clients through the same due diligence required of auditors to guard against misuse of the CB or AB logo.

c) Applications to CB's for e-Stewards Certification and Scope of Certification

All requirements located in Appendix B, letter b) also apply here.

Organizations may provide a range of Recycling services which must be understood and considered during the preparation of a quotation for auditing and certification, and subsequent audit planning. Applications which are provided and received by CB's shall specifically require information needed to identify the scope of services provided by each Organization, relative to the Standard, in order to determine which Recycling facilities and Ancillary Sites [see d) below] are both eligible for and required to fall under e-Stewards certification. Therefore, Organizations must provide CB's with information to determine the following:

1. Has applicant disclosed all Recycling facilities and all Ancillary Sites that are located within the country?
2. Has applicant disclosed all activities being performed at all Ancillary Sites (Ancillary Sites may not perform any Recycling activities, as defined)?
3. Has applicant disclosed all subsidiary Recycling sites that are majority owned by the same owner(s)?
4. Has applicant disclosed all other separate Recycling companies that are majority-owned by the same owner(s) or top management?
5. Are data destruction services provided by the applicant? Describe.
6. What Potentially Hazardous Processing Technologies are employed (e.g., shredding, crushing, thermal or chemical processes, etc.)?



7. Has the applicant provided an accurate, up-to-date description or diagram indicating the extent of the Recycling Chain that begins with the Organization and ends with Final Disposition of all Hazardous Electronic Waste, Problematic Components and Materials, and/or equipment/components going for reuse, which originated from the Organization's facility or Control?
8. Describe any exportation of Hazardous Electronic Waste and Electronic Equipment, directly or indirectly (e.g., through downstream vendors), including Electronic Equipment going for reuse, Recycling, and disposal.
9. Is the applicant currently ISO 14001: 2004 certified by any ANAB-accredited CB, or a CB accredited by another accreditation body approved by the e-Stewards program administrator?
10. Is the applicant currently certified to BS OHSAS 18001?

Prior to conducting any certification audit, the CB shall assure that all affiliated sites (i.e., other Recycling sites, including any subsidiary sites or others owned by the e-Stewards owner, regardless of brand), of the contracting organization are also contracted for certification within 18 months of the certification date of the initial site.

d) Audit Person-Days and Audit Planning

When quoting e-Stewards certification services, the CB shall consider the information required at the application stage (Section c) and quote not less than 150% of audit days than would be quoted for simple, accredited ISO 14001: 2004 certification of the same Organization. International Accreditation Forum (IAF) Mandatory Document for Duration of QMS and EMS Audits, IAF MD 5 - current version (see [www.iaf.nu](http://www.iaf.nu)), shall be the basis for this determination.

If the Organization requesting e-Stewards certification services is already ISO 14001:2004 certified, the CB may reduce the audit days calculated for the initial e-Stewards certification audit by no more than 50% from the above calculated audit days to account for this existing certification. The 50% maximum reduction refers to upgrades from an existing ISO 14001 audit as a unique event. If the upgrade is planned to be conducted coincident with a pre-planned ISO 14001 surveillance audit, the (up to) 50% reduction pertains only to the e-Stewards-specific portion of the Standard. The number of audit days that would have been spent conducting the routine surveillance or renewal of the existing ISO 14001 certification must be added to the days calculated for the e-Stewards audit.

If the applicant is also already certified to BS OHSAS 18001, the CB shall comply with the requirements of IAF MD 11 when determining what further reductions in minimum audit days are allowable.

Ancillary Sites<sup>66</sup> owned or Controlled by a certified e-Stewards Organization shall be included and documented within the Organization's management system, and applicable operations at Ancillary Sites shall be addressed by the management system, including material balance accounting, internal audit, and downstream accountability. However, the CB need not routinely audit these Ancillary Sites for conformity and these sites shall not appear on the certificate of conformity for the Organization. Auditors should verify, through available objective evidence, that Ancillary Sites are addressed in the management system. Ancillary Sites that are proximate to the Processing site

<sup>66</sup> Please note that Ancillary Sites are not allowed to perform Recycling activities such as dismantling, shredding, exporting, or refurbishing Electronic Equipment (see definition of Ancillary Sites). If so, they shall be considered to be Recycling (Processing) sites, requiring certification.



being certified may be visited, as time permits during routine audits by Auditors, as a means to confirm that appropriate system controls are in place at Ancillary Sites. Otherwise, Auditors should seek evidence of such controls during Recycling facility audits associated with any particular Ancillary Site.

CB's are encouraged to respect the work of and certifications issued by other accredited CB's, relevant to the e-Stewards Standard. Objective evidence of current certification to ISO 14001 by another accredited CB shall be considered in the planning of an e-Stewards audit and associated quotation for services with the intention of minimizing redundancy and maximizing value for the e-Stewards Organization.

e) Contracting with the e-Stewards Organization

CB contracts with all e-Stewards Organizations shall include the following special conditions above and beyond standard contract terms:

1. Organizations shall permit both announced and unannounced audits, including special surveillance audits, by the CB, and/or the program administrator as part of their oversight functions,
2. Organizations shall agree to and allow the CB to share any audit or certification related information with the e-Stewards program administrator upon request by program administrator during or after the contract period,
3. The e-Stewards program administrator is permitted to join any audit as witness,
4. Organizations shall execute a License Agreement with the e-Stewards program administrator prior to receiving their certificate(s) from their CB,
5. All Recycling facilities which Process, manage, or Control Electronic Equipment and are owned or controlled by the Organization shall be included in the contract for certification within 18 months of certification of the initial facility, and
6. All Ancillary Sites which are owned or Controlled by the Organization shall be included and managed appropriately in the scope of the management system.

f) Multi-Site Certification

Organizations with more than one Recycling site must certify all Recycling sites that are majority-owned, franchised, or otherwise legally and operationally Controlled by the client and which are located within the country of the applicant site(s) in order to attain a corporate certification [see letter c) and Appendix B, letter b) above for description of facilities that are required to become certified].

When a multi-sited Organization requests certification, the CB shall not permit any certification process to begin unless all Recycling sites located in that country are contracted for e-Stewards certification. Certifications of other sites under the same ownership shall be completed within 18 months of the initial site certification. When multiple CB's are involved in an Organization's corporate certification, the CB that has certified the headquarters site shall be the CB of record for the corporate certification.

On the lead-up to achieving corporate certification, individual site certificates may be granted. These certificates, however, shall be revoked if all required sites are not certified within 18 months.



Site sampling shall NOT be permitted for the initial certification of any of the company's sites, but may be followed, if allowable in accordance with IAF Mandatory Document for the Certification of Multiple Sites Based on Sampling, IAF MD 1 (current version) after each site has been initially audited and certified (i.e., sampling may be permissible during the surveillance mode and/or recertification).

g) e-Stewards Audit Reporting Requirements

All CB audit reports shall be in English language and clearly indicate that each of the following critical principles was covered during the audits (including surveillance audits):

14. No prohibited export of Hazardous e-Waste or equipment going for reuse,
15. Data security is assured for all customers,
16. Workers are systematically protected from toxic exposures, illness, and injury, and housekeeping and Industrial Hygiene practices minimize migration and take home exposures,
17. Safe practices are defined and followed for handling Hazardous Electronic Equipment,
18. Hazardous e-Wastes (including untested equipment and components destined for refurbishment) are identified and followed to acceptable Final Disposition,
19. Material balance accountings are verified as calculated by the Organization.

For these critical areas (1 - 6 above), the auditor should document how Standard conformity was established by addressing the following:

- Which departments were visited and reviewed for this determination?
- What records were reviewed, including dates and subject matter?
- What observations were made against the Standard and/or documented system requirements?
- Which sites were visited?

h) Data Collection and Reporting

The CB shall report to the e-Stewards program administrator every contract signed in a timely manner following signature.

The CB shall establish employee head count at the application phase, and verify at the initial certification audit and all subsequent routine audits. This information shall be used to assure proper audit time during the course of the certification contract.

Prior to initial certification and at each surveillance audit the CB shall confirm that the certified e-Stewards Organization has a current licensing agreement in place with the e-Stewards program administrator.

During and subsequent to certification, the CB shall assure that use of the e-Stewards logo by the e-Stewards Organization is in accordance with the licensing agreement.

The CB audit teams shall verify, as an element of each audit, that the e-Stewards Organization has reported all required performance data to the designated data repository.



The CB shall report all e-Stewards certifications to the e-Stewards program administrator within 5 business days of certification. Any changes to certification status (i.e., suspension, withdrawal, cancellation) shall be reported to the e-Stewards program administrator within 5 business days.

i) Certificate Issuance

The CB shall issue a site or corporate certificate(s) indicating conformance of the e-Stewards Organization with all applicable requirements of the Standard when and only when:

- ▶ All non-conformances have been cleared by review and approval of a suitable corrective action plan in accordance with ISO 17021 paragraph 9.1.15 requirements, and subsequently
- ▶ The CB has confirmed that the Organization has a valid and current licensing agreement in place with the e-Stewards program administrator for the use of the e-Stewards name and logo.

The CB shall not issue, or shall withdraw or suspend, as appropriate, a certificate to an Organization if the e-Stewards program administrator has issued a Critical Non-Conformity to that Organization until and unless the program administrator has cleared the Critical Non-Conformity, in writing.

The certificate issued shall bear the logo of the CB, the AB, and the e-Stewards logo (as provided by the e-Stewards program administrator to the CB in conjunction with its Licensing Agreement). No unaccredited e-Stewards certificates may be issued by a CB.

The e-Stewards certificate issued by the CB may reference concurrent certification with ISO 14001, or the two certificates can be issued separately.

If a change in ownership, a bankruptcy filing, potential Critical Non-Conformity, or another significant change or event occurs which could affect the certified e-Steward's capability or conformity with the Standard, the CB shall notify the e-Stewards program administrator of the circumstances within 5 working days, and follow the requirements of ISO 17021 with regard to assuring continual conformance with the Standard. The e-Stewards program administrator requires that a special surveillance audit be conducted of any such-affected certified sites within a maximum of six months of notification, or sooner in exceptional circumstances.

j) Ongoing Training and Qualifications of e-Stewards CB and AB Auditors

The e-Stewards CB and AB program managers and auditors shall participate in refresher/retraining courses at least once every three years. Additionally, when new versions of the e-Stewards Standard are released, an upgrade training provided by the e-Steward program administrator designated training organization shall be required prior to auditors auditing to the new version of the Standard.

k) Agreement to Oversight of the Certification Process by the e-Stewards Program Administrator

The AB and CB shall agree to a reasonable level of oversight by the e-Stewards program administrator. This oversight may include witnessing of the initial accreditation office audit and witnessed audit, review of AB and CB documents and procedures related to the e-Stewards program, witnessing of CB audits of e-Stewards applicants and/or certified e-Stewards, CB headquarters visits, and review or witnessing of other AB or CB events that the program administrator considers to be relevant to its oversight of the e-Stewards program.

To facilitate this oversight, CB's shall submit to the e-Stewards program administrator a monthly report which notifies and routinely updates it of the following:

1. New e-Stewards quotations issued since last monthly report,





2. New e-Stewards contracts (company and site locations) issued since last monthly report,
3. Confirmed e-Stewards audits (initial, surveillance, special, or renewal) scheduled within the next 60 days from the current report including sites/locations to be audited and specific auditors assigned, and
4. New certificates issued, suspended or withdrawn since last monthly report.

Accreditation Bodies shall report to the e-Stewards program administrator, on a monthly basis, the schedule for the upcoming 60-days, of any applicant CB audits and current e-Stewards CB office and witnessed field audits that are planned, including dates, locations, and CB's to be witnessed.

END OF APPENDIX C



## APPENDIX D – GUIDANCE DOCUMENT

The Guidance Document for the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment: Version 2.0© is a work in progress which will be updated on a continuous basis as new information becomes available on best practices. This document is not binding on e-Stewards Organizations but is for guidance and explanation purposes. However, this document is an essential adjunct for implementation and understanding of this Standard, and its placement on the Worldwide Web is only to facilitate fluid improvement and updating. It is located in its most current version on the Worldwide Web at: [www.e-stewards.org](http://www.e-stewards.org).





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