Responsible Recycling™

Guidance

R2:2013 Standard

September 1 2014

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Introduction

The SERI Guidance Document has been developed to provide clarification on conformance to the R2:2013 Standard (R2:2013 or Standard). This document has been designed as a tool that can aid recyclers in both preparing for an R2:2013 audit and in maintaining ongoing conformance. Specifically, the guidance offers explanations about how the Provisions of R2:2013 can be put into practice and what activities constitute conformance. While auditors can only audit to the language of R2:2013, it is expected that auditors will also use this document to assist in determining if recyclers have met the practices required in the Standard.

Offering guidance about the interpretation and implementation of R2:2013 is an important part of the SERI quality assurance program. Because electronics recycling operations can vary widely based on services and size, implementation of the principles of the Standard will look different from operation to operation. However, each facility is expected to operationally apply the principles of the Standard with the same rigor. This guidance document provides further information about what conformance may look like under different conditions and what the expectations for demonstrating conformance are for all R2:2013 certified facilities.

This guidance can be used by recyclers to prepare for audits and as a reference while they maintain conformance. Auditors and consultants preparing recyclers for their audit will find the explanations and examples helpful as they evaluate recycler performance. OEMs, businesses, and other clients of recyclers may use the guidance document to better understand industry best practices implemented by R2:2013 certified recyclers.

This document was designed to be an accessible reference tool. The guidance is laid out in table format to relate information relevant to specific areas of the Standard and make it easy to locate. The guidance is organized according to each provision of R2:2013 and two forms of guidance are offered throughout this document. The first form is *General Guidance*, which provides background and the intent of the whole provision. The second form is *Clarifications*, which addresses specific sections of the provisions and sets forth example best management practices to demonstrate conformance with the requirements. The comments are numbered as in the following example: Comment 1.1. The 1 before the period refers to the provision number. The number after the decimal refers to the number of the comment within that provision.

This is official guidance developed by the R2 Technical Advisory Committee through a multi-stakeholder consensus-based process, and adopted by SERI Board of Directors. Any other guidance offered outside of this document is not official guidance. This guidance is not intended to provide, nor should be interpreted as providing, legal advice. Compliance with all laws and regulations is the sole responsibility of the recycler.

Guidance for the Introduction Section of the R2:2013 Standard

Introduction – Clarification		
Comment No.	**Area of the Standard**	**Guidance**
I.1	R2:2013 requirements are not legal requirements	The requirements of R2:2013 are not legal requirements and do not override the legal requirements that recyclers are subject to. However, R2:2013 requires many industry best practices which go beyond legal compliance. Complete and continuing conformance with R2:2013 requirements is necessary, except in the unlikely case that they conflict with a legal requirement.
I.2	Scope of the "electronics recycling industry"	Reference to "recyclers" and the "recycling industry" includes all organizations that are collecting, refurbishing, recycling, reselling, demanufacturing, or brokering, as well as asset recovery operations, and leasing companies that engage in any of these activities.
I.3	Accredited certification program	Only certification bodies (CBs) accredited under ISO/IEC Standard 17021 and accredited under an IAF multilateral recognitions arrangement signatory accreditation to provide R2:2013 certification and that have an SERI approved accreditation program (for instance, ANAB) may issue a certification to R2:2013. Self-declaration and un-accredited 3rd-party certification indicating conformance with R2:2013 are not recognized.
I.4	Facility certification	R2:2013 certification is facility-specific. Award of certification to a facility that is part of a company with more than one site applies only to the site listed on the certificate, and does not apply to any other site owned by the company. Companies claiming certifications must have had each location audited and separately approved by an accredited CB (or included as a multi-site certificate). If not all sites are certified, then the company must limit each statement of certification to the specific site(s) certified. Furthermore, certification only applies to the approved scope stated on the certificate, which may not encompass all activities at the facility. Example: the scope may not include metals recycling at a multi-purpose facility. However, the scope must include all activities related to electronics recycling that take place at the facility.
I.5	Reference to laws	R2:2013 does not reference specific laws. Legal requirements vary by physical location and change over time. R2:2013 requires compliance with all applicable environmental, health & safety, data security, and import/export laws. Depending on the recycler's location and scope of activities and the location of businesses that the recycler transacts

Introduction – Clarification		
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		with, the legal requirements will vary.
I.6	Recycling Chain	The Recycling Chain (see definitions) includes all entities involved in the movement of electronic equipment being recycled; all entities that handle equipment, components or materials that have passed through an R2:2013 electronics recycler's facility or control. Recycling is the reuse of the whole equipment, components, or materials from the original equipment sent for recycling. Depending on the capabilities of each entity in the Recycling Chain and condition or quality of the equipment, the outputs will vary. Some entities may only collect equipment or only repair viable equipment, but send remaining equipment to other recyclers. Others may only broker the transaction for buying and selling of equipment. For reuse, the Recycling Chain continues through each downstream entity until the equipment or materials are ready for reuse. In terms of materials recovery, the final recycler is the last entity to process the material into a specification grade commodity before use as feedstock to produce new basic materials and finished products (e.g., a smelter, mill or foundry).

Guidance for Provision 1 – Environmental, Health and Safety Management Systems (EHSMS)

Provision 1 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
1.1	Provision 1 plays a central role in R2:2013	Provision 1 provides the foundation upon which the rest of R2:2013 is built. It provides the framework for conforming with, and auditing to, the Standard. The requirement for the EHSMS certification from an accredited management system standard is not just that it be established, but that it be used – thus generating documented evidence of the ongoing conformance and effectiveness of controls to support each requirement of R2:2013. The EHSMS will articulate a set of activities that take place on a continuous basis.

Provision 1 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
1.2	EHSMS must be certified by an accredited certification body	The type of EHSMS must be approved by SERI and be certified by an independent accredited certification body. It may be done at the same time as R2:2013 audits. It must be completed and awarded prior to final award of the R2:2013 certification. The following management system standards are currently approved by SERI to fulfill the management system requirements in R2:2013 Provision 1. • RIOS™ (a combined Quality, Environmental and Health and Safety management system designed specifically for all types of recycling and refurbishing organizations); or • Combination of ISO/IEC 14001 (a standard for environmental management systems for all types of organizations), and OHSAS 18001 (a standard for health and safety management systems for all types of organizations) An "Accredited Certification Body" is accredited by an International Accreditation Forum member body under the current ISO/IEC Standard 17021 for the Standard in question.

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Comment No.	**Area of the Standard**	**Guidance**
1.3	(a) scope	A scope statement lists the activities, products or services subject to the certification audit and will appear on the R2 certificate issued to the recycler. The scope statement should be accurate, congruent with electronics reuse and recycling, and inclusive of all electronics recycling activity performed by the organization applicable to provisions of R2:2013. A sample scope statement could include the following language – "Electronics recycling and remarketing, including receiving, sorting, dismantling, refurbishment and data destruction."
1.4	(a) justified allowances	"Justified allowances" are detailed in the SERI Code of Practice, Section VII. Allowances must be approved during the initial contract with the CB and corroborated by the CB during initial certification audits and confirmed throughout the certification. Allowances shall not change the requirements ofR2:2013, but remove specific applicable

Provision 1 – Clarifications		
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		requirements from the scope of the audit for certain types of organizations: e.g. a broker, campus, and co-location (see section VII of SERI Code of Practice for criteria and allowance). An example of justified allowance might be a broker that does not test equipment before selling it to a recycler that does test. In this case, the broker might be excluded from Provision 6 – Reuse and Refurbishment, depending on the specific circumstances.
1.5	(b) certified to one or more approved EHSMS standards	As of July 1, 2013, SERI has approved RIOS™, or a combination of both ISO 14001 and OHSAS 18001, to fulfill this requirement. In the future, SERI may approve additional EHSMS standards. At such time, they will be listed on the SERI website (www.sustainableelectronics.org).
1.6	(c) Meaning of the phrase "fully implement and review"	Section 1(b) calls for an R2:2013 recycler to certify its EHSMS while (c)(1) calls for it to "fully implement and review" its environmental, health and safety [EH&S] and data security matters. Documented procedures must be created to manage changes and proactively evaluate EH&S matters. Written procedures must be created, at a minimum, to address the highest ranked environmental impacts and health and safety risks, and are strongly encouraged for all activities subject to legal requirements. Activities called for in the EHSMS should generate records as evidence that procedures are in place and used on an ongoing basis. This includes documented evidence of the ongoing use of each element of the "Plan, Do, Check, Act" (PDCA) model for continual improvement encompassing all areas within the scope of the EHSMS.
1.7	(c)(1) Meaning of the phrase "written goals"	In (c)(1), "written goals" includes "objectives" and "targets". Goals will be developed based on your identified environmental impacts, health and safety risks and data security matters. Goals are not created to simply meet conformance to R2:2013 or compliance with laws. They should be reflective of continuous improvement efforts. Although not required to be quantitative, they should be measurable. Examples: an environmental goal might be to reduce air emissions by 10%, a health and safety goal might be to achieve 12 quarters with no recordable injuries, and a data security goal might be to add five new cameras in the next year.

Provision 1 – Clarifications		
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1.8	(c)(2) Scope of the "list of activities"	The list of activities must include each activity that will be performed to ensure ongoing conformity to R2:2013 provisions. This may be a written plan describing how each R2:2013 provision is documented and managed in the system, including the specific named documents addressing each. Also, the list of activities may be a cross-reference of R2:2013 provisions to each document that satisfies the provision. The auditor should be able to reference this list of activities to find conformance to R2:2013 provision.

Guidance for Provision 2 – "Reuse, Recovery, . . ." Hierarchy for Responsible Management Strategies

Provision 2 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
2.1	This Provision describes the Hierarchy of Responsible Management Strategies	Evidence of conformity to Section 2(a) will be a written section of the EHSMS policy that includes this Reuse, Recover, Dispose (RRD) hierarchy policy. The policy may stand-alone or be included as part of another policy. To demonstrate adherence to the written policy, documentation should also include a flow chart or procedure that shows how electronic equipment, managed on-site and by downstream vendors, is sorted and directed to reuse and various types of materials recovery. This flowchart or procedure should illustrate decision points, depending on the equipment, where a determination is made whether to reuse or recycle all or part of the equipment. This section of the EHSMS policy addressing the hierarchy policy should be revisited on a regular basis, or when downstream vendors and processes change, to ensure that the information is up-to-date and accurate. Records of shipment, receipt, and/or processing by downstream vendors are one example of proof of adherence. When reviewed in total, the allocation of equipment to different vendors will show the flow of equipment and materials consistent with the hierarchy. For information on the treatment of FMs and the RRD hierarchy, see Guidance on (Provision 5(b)).

Provision 2 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
2.2	(a) "electronic equipment, components, and materials"	References to electronic equipment and materials do not include daily trash or anything that can be recycled through regular non-electronic recycling.
2.3	(a)(1) regarding "reuse" activities	Section (a)(1) requires an R2:2013 recycler to take "all practical steps" to reuse and resell "tested" equipment. This sentence does not demark a clear line between equipment that should go to reuse and equipment that should go to materials recovery. That is a dynamic decision based on market conditions, value, and condition of the equipment. However, "tested" and functioning equipment for which there is a market should go to reuse or a qualified refurbisher unless a source customer directs otherwise. Consider also that parts from the equipment may be reusable for repair or upgrades where the whole unit cannot be reused. For recyclers that lack the capabilities to perform refurbishing, reuse, or remanufacturing activities, the refurbishing processes may be subcontracted to a refurbisher or the equipment may be sold to a refurbisher. Similarly, for refurbishers who lack the capabilities to be recyclers, the recycling processes may be subcontracted to a recycler or the equipment may be sold to a recycler. Note however, that these situations do not relieve R2:2013 recyclers or refurbishers of the requirements of R2:2013 (especially Provisions 3, 5, and 6) relating to the equipment and associated materials transferred to a refurbisher or recycler, including all subsequent tier downstream refurbishers or recyclers. Equipment that is determined to be too costly to repair or where the economic value is too low to justify restoring the unit for reuse can be diverted for materials recovery. Recyclers shall be able to provide a recovery rate of material that enters the facility or otherwise provide evidence of their focus on reuse. Evidence could come in the form of aggregated trend data, routing instructions, description of the rigor used for reuse evaluation, etc. It should be recognized that the ratio of reuse to recovery will vary greatly from R2:2013 recycler to R2:2013 recycler (and even month to month within the same R2:2013 recycler's

Provision 2 – Clarifications		
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		operation) based on the quality and type of incoming streams of equipment. Thus, comparison of ratios is not a valid method of determining conformance to this Provision.
2.4	(a)(2) assumptions about "Materials Recovery"	"Materials recovery" is synonymous with recycling. R2:2013 presumes, given the current state of recycling technology and best practices, that it is technically and economically feasible to recover most of the materials in electronics equipment. Materials recovery includes recycling of base components, such as precious metals, ferrous and non-ferrous metals, glass and plastic.
2.5	(a)(3) "Energy Recovery and Land Disposal"	R2:2013 presumes that viable reuse and materials recovery are available for materials from electronics and therefore that virtually no material derived from electronic equipment needs to go to incineration or to land disposal. Example: fluorescent lamps from LCD screens. Although these could be disposed of in a licensed hazardous waste landfill, a viable option exists in the marketplace and they should be recycled through licensed mercury retorters. Currently allowed exceptions include: 1. A customer requirement for destruction through incineration-type energy recovery (due to the proprietary nature of the material) when it is legally permissible to do so, 2. Chemically treated and/or plastic laminate wood, 3. Non-refurbishable ink cartridges. If a recycler sends no electronic materials for energy recovery or to disposal, this shall be stated in the EHSMS plan. No "viable" options for reuse or recycling means that a process/technology is currently not available in the marketplace to reuse or recycle the particular material from electronics.

Guidance for Provision 3 – Legal requirements

Provision 3 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
3.1	This Provision requires compliance with legal requirements.	As referenced in the Introduction, an R2:2013 recycler must comply with all applicable legal requirements relating to environment, health & safety, data security and import/export. As laws change from time to time, it is the responsibility of the R2 recycler to be aware of and maintain compliance with these laws.

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Comment No.	**Area of the Standard**	**Guidance**
3.2	(a)(1) document requirements	A written legal compliance plan should be developed and should include a comprehensive registry (list) of legal requirements and a plan to evaluate and monitor compliance with these requirements. The compliance plan should include a process to evaluate and keep current on all legal requirements applicable to the organization. The legal registry should address the import and export requirement of countries to which Focus Materials will be sent or countries through which these materials will transit. Evidence shall show what is being dome to keep the registry up-to-date as well as periodic evaluations of compliance. Compliance audits by the R2:2013 recycler shall be conducted periodically, whether monthly, quarterly, or annually) as stated in the EHSMS (e.g., RIOS 5.1.2 or ISO 14001/OHSAS 18001 4.5.2). The timing of compliance audits may vary depending on the compliance history of the facility (e.g., more often if there have been problems uncovered in past audits). Evaluation of compliance should be conducted by competent individuals. Such evaluation should include both a review of the comprehensive legal registry (list) as well as a facility-wide review of compliance. Example: if the registry indicates that battery labeling is required, the compliance auditor should walk through the facility and look for properly labeled batteries. The comprehensive legal registry shall describe the laws and regulations in sufficient detail to indicate the activities required, or prohibited, by the recycler to achieve compliance. Additional information for each legal requirement might include required training, personnel

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		responsible, required reporting, and applicable operations. A list of legal requirements that MAY be applicable to a recycler include (not exhaustive): • Air permits • Stormwater permits • Wastewater discharge permits • Hazardous waste rules • CRT, mercury, PCB laws or regulations • Battery and used oil regulations • Transportation – state and national • Electronics recycling laws/programs (e.g., takeback or producer responsibility laws) • Health and safety – state/provincial, local and national • Data security regulations (US examples include HIPAA, Sarbanes Oxley, Gramm Leach Bliley) • Import/export controls (example: Basel Convention, for those countries that have ratified and implemented it)
3.3	(a)(2) demonstrating the legality of shipments	Section (a)(2) prohibits a recycler from: • Either shipping to or utilizing any downstream vendor (or any downstream vendor that utilizes a downstream vendor, etc.) who ships Focus Materials (FMs) from a country that prohibits such exports. • Either shipping or utilizing any downstream vendor (or any downstream vendor that utilizes a downstream vendor, etc.) who ships FMs to any country that has laws prohibiting such transits or imports. Section (a) (2) requires a recycler to: • Document the legality of all shipments of any FMs from the recycler to and through any countries. To document the legality of a shipment, due diligence should be performed prior to shipment. • Include untested or non-functioning whole equipment, components, or materials containing FM's. See Appendix B Example Focus Material Components

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		Note that in R2:2013 all international shipments containing FMs must be documented and evaluated for legality. It does not matter if the shipment is to an OECD country or a non-OECD country. Documentation to show conformance might include, but are not limited to: • Downstream vendor permit to operate that shows imported material is processed • Downstream vendor permit that lists accepted material and from which broker(s)/companies/countries accept such materials • Downstream vendor license to import materials • Letters from the importing country's Competent Authorities • Letters from the importing country's local enforcement agency • Copy of a law from the importing country that states the import is legal • Permission to import documents for material loads • Broker license from importing country A recycler shall be able to produce up-to-date documentation consisting of the records required under 3.a.2 and must make this documentation available for each importing, transit and exporting country. The documentation must be in language understandable to the recycler and auditor. Letters received from Competent Authorities[1] must be current and valid for the materials or equipment imported/transit/exported, for the time period in which the import/transit/exports occur, and be in a language, or translated to a language (by an independent 3rd party), that the recycler and auditor can clearly understand. Any law or court ruling referenced for the purpose of demonstrating legal imports/transit/exports must be current and applicable to the type of materials in question and to the destination in

[1] A list of Competent Authorities can be obtained at the Basel Convention website.

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		question. The auditor must audit all FM streams during the initial certification audit, including low-grade circuit boards found in mice, power supplies, and keyboards.
3.4	a.3 regarding legal compliance plan	The legal compliance plan and compliance evaluation should be consistent with the certified EHSMS plan. Examples: • RIOS 3.1.2 Legal, Product and Other Relevant Requirements and RIOS 5.1.2 Evaluation of Compliance • ISO 14001/OHSAS 18001 4.3.2 Identification of Legal and Other Requirements and ISO 14001/OHSAS 18001 4.5.2 Evaluation of Compliance

Guidance for Provision 4 – On-Site Environmental, Health, and Safety

Provision 4 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
4.1	Protection of workforce and public health and the environment	A recycler must demonstrate knowledge of the EH&S risks associated with the materials, equipment, location, and processing techniques being managed or used on-site, as well as the relevant legal and regulatory requirements. The recycler shall provide all applicable permitting and oversight records required by EH&S risks and local, state/provincial, and national laws based on the type of operations being performed in the facility. Staff must be familiar with these requirements and have a process to monitor changing legal obligations.

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Comment No.	**Area of the Standard**	**Guidance**
4.2	(a) regarding a recycler's "technical capability to process" equipment	The word "process" in this context includes the receipt, storage, treatment, and shipment to a downstream processor. Treatment may include, but is not limited to, testing, refurbishing, repairing, demanufacturing, shredding, and data destruction. Equipment and processing techniques will evolve with time. Accordingly, recyclers should obtain the training and expertise to properly manage new technology, equipment, and new materials as needed.
4.3	(b) cleanliness of operations	Facilities should conform to storage requirements under all applicable waste regulations and R2:2013 Provision 9. Facilities should be in compliance with applicable health and safety housekeeping requirements. It is critical that all places of employment, passageways, storerooms, and service rooms be kept clean, dusted, orderly and in a sanitary condition. The floor of every workroom should be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage should be maintained and false floors, platforms, mats, or other dry standing places shall be provided where practicable. To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards. Evidence of "planned and regularly implemented" housekeeping may be kept in a standalone set of housekeeping procedures. Alternatively, specific instructions may be included in the procedures/work instructions for each required task. Evidence of "monitored" housekeeping may include daily, weekly or monthly housekeeping inspections.
4.4	(c) hazards identification	The hazards identification and assessment shall address reasonably foreseeable potential hazards that can arise from any activities taking place. Recyclers should document job hazard analysis reviews for work and storage areas. Hazards analysis may include facility inspections, health & safety aspects evaluation, and/or job hazards assessments. Documentation of jobs with work instructions may also include a risk assessment of the specific job. Any or all of these methods are effective methods for ongoing hazards identification.

<table>
<tr><th colspan="3">Provision 4 – Clarifications</th></tr>
<tr><th>Comment No.</th><th>Area of the Standard</th><th>Guidance</th></tr>
<tr><td></td><td></td><td>“Ongoing” job hazard analysis shall be an integrated part of managing change. Example: Safety Data Sheet (SDS) sheets should be procured when a facility accepts new materials or uses new chemicals in processing. These documents are an important means of communicating hazards entailed in managing some substances. They (or the lack thereof) may also indicate the need to further evaluate current processes in order to plan for new EH&S risks introduced by the use of new materials or chemicals.

The hazard identification should be consistent with the certified management system. Examples include:
RIOS 3.1 Identifying the QEH&S Footprint
ISO 14001 4.3.1 Identification of Environmental Aspects
OHSAS 18001 4.3.1 Hazard Identification, Risk Assessment and Determining Controls</td></tr>
<tr><td>4.5</td><td>(d) managing hazards</td><td>Demonstration of managing EH&S could include a table that cross references how the significant EH&S aspects are controlled.

Consider the following examples:

<table><tr><th>EH&S aspects</th><th>Control</th><th>Type of Control</th></tr><tr><td>Lead dust from shredding</td><td>Dust Collection System</td><td>Engineering</td></tr><tr><td>Potential for Fire</td><td>Emergency Procedures</td><td>Administrative</td></tr><tr><td>Potential for Cuts in Dismantling</td><td>Dismantling Procedure, Training and gloves</td><td>Administrative and Personal Protective Equipment (PPE)</td></tr></table></td></tr>
<tr><td>4.6</td><td>(d) minimizing risks</td><td>Demonstrating risk minimization can be done through benchmarking and/or reduction targets. Recyclers becoming certified for the first time might not have a history of information for hazards management, but should have a plan for collecting the information and implementing best available practices and any needed corrective actions, particularly with respect to potential exposures to lead and the other substances identified in footnote 6 on Page 5 of R2:2013. This is particularly important, potentially, in facilities that are breaking/separating the leaded portion of CRTs and in facilities with shredders that process</td></tr>
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		lead containing materials that do not have adequate engineering controls in place. Recyclers seeking to renew a certification should have a record of this information.
4.7	(d)(1) downstream vendors as an administrative control	The use of downstream recyclers, qualified in accordance with Provision 5, for whole intact equipment constitutes an administrative control of isolation under (d)(1)(B) that would not require analytical monitoring/sampling under (e). Example: if CRT monitors are sent intact to a specialized downstream vendor, qualified in accordance with Provision 5, to separate the panel from funnel glass instead of processing at the R2:2013 recycler's facility, then the safety hazard would be isolated by externalizing the process.
4.8	(e) enumerating sampling and monitoring practices	Provision 4 identifies the options, engineering controls, administrative controls, and personal protective equipment (PPE), the recycler must consider to ensure EH&S regulatory compliance and control of the identified EH&S risks. These controls should be implemented and documented. To ensure that these controls have been properly implemented the recycler must identify and implement monitoring, which may or may not be required by law or regulation. Monitoring will be facility specific and depend on the operations performed and equipment used at the facility. The recycler must identify the necessary monitoring and describe how it is being conducted at the facility to assure the minimization of identified EH&S risks. Examples of testing and monitoring that should be conducted in recycling facilities, as applicable, are: • Air monitoring for facilities with processes that produce dust which may contain lead, cadmium, or mercury; or gas, fumes, vapors, etc.; • Bio-monitoring of employees where workers are required to wear respirators (e.g. mercury retort or lead recovery) or where high airborne lead levels are detected based on monitoring or sampling; • Wipe samples where air monitoring indicates high heavy metal elevations; • Stormwater sampling and monitoring during storm events if process related materials are stored outside, uncovered, or in a known flood plain; • Noise monitoring for high noise exposure that may exceed regulatory limits; • Monthly inspections of fire extinguishers;

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		• Routine inspections of power tools; and • Daily forklift inspections. Procedures for sampling for exposure levels, the permissible exposure limits (PELs), and how the facility and workers are monitored must also be described in the EHSMS. The recycler should have information demonstrating that worker and facility conditions are consistent with, at a maximum, PELs. For cases in which the hazard has been eliminated through engineering controls, the recycler should have ongoing records of monitoring and/or maintenance for the engineering controls to demonstrate effective ongoing operations. Example: a dust collection system should be monitored to change filters as prescribed by the equipment manual. With lead exposure, for example, periodic air and wipe sampling and, in some instances, bio-monitoring will be the appropriate method to prove ongoing abatement of the hazard. Recent scientific research identifying dangerous lead exposure levels in some types of electronics recycling facilities raises the need to reexamine what type and frequency of monitoring is needed to identify this risk. Where high lead levels are detected for example, potentially, in facilities that are breaking/separating the leaded portion of CRTs and in facilities with shredders that process lead containing materials that do not have adequate engineering controls in place—the facility should: a) Include testing for lead in blood testing of employees (e.g., for drug usage); b) Conduct wipe samples of relevant processing areas and any other areas to which lead dust may spread. The recycler should be able to demonstrate sampling and monitoring in the initial audit consistent with what is identified in the required protocol. There may not be an extensive history of sampling and monitoring data. However, a recycler performing ongoing conformance reviews and subsequent audit renewals will begin to develop a history of monitoring and sampling data consistent with the protocol described in the EHSMS.

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4.9	(f) protection of personnel	The plan shall identify safety and environmental risks, personal protective equipment needed in works areas, and engineering and industrial hygiene controls in place to prevent worker/personnel exposure to identified risks. With respect to activities and locations where high levels of lead are detected, facilities should address the following as applicable: 1. Assessment of Engineering Controls: If monitoring indicates high levels of lead in a work area, take additional actions above and beyond regular maintenance of engineering controls used to eliminate or reduce exposure to lead (e.g., hoods, ventilation systems). In such cases, the facility should review the engineering controls with an eye to modifying or improving their ability to capture fugitive airborne lead. Alternative means of processing should also be evaluated. 2. Personal Protective Equipment: If monitoring indicates high levels of lead in work areas where respirators are not required by law, consult with a certified industrial hygienist about their use, and have employees use them if recommended by the hygienist. In the event that air monitoring indicates overexposures, interim means, while engineering controls are being established, would dictate the requirement for respiratory protection along with other PPE. 3. Industrial Hygiene Controls: a. Wet cleaning to capture potentially contaminated dust in all areas potentially affected. b. Work Clothing: working clothes should be used only on the job and, as needed, be professionally cleaned by the recycler. Employees should change back into their street clothing before leaving work. c. Personal Hygiene: at a minimum, hand and face washing before eating, drinking, smoking is required and before leaving to the facility.

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		4. Training: As part of ongoing employee training programs, provide training about the risks of exposure to lead and other heavy metals**,** and proper techniques to minimize such exposure, such as personal decontamination, use of PPE, work practices designed to minimize emissions/dust generation and daily housekeeping.
4.10	(g) demonstrating promotion of worker health and safety and environmental protection	The person designated for promoting worker health and safety and environmental protection must be knowledgeable of applicable laws and regulations designed to protect worker health and safety and the environment, and be knowledgeable of the EHSMS and the Focus Material (FM) Management Plan. Examples: In U.S. recycling facilities the person filling this role must be competent and knowledgeable of all national and state/provincial environmental and OSHA regulations, PELs, the EHSMS plan, and the FM Management Plan; and in facilities outside the U.S., the person filling this role must be knowledgeable of all relevant national, state/provincial regulations pertaining to worker safety and environmental monitoring. The recycler shall be able to demonstrate how worker EH&S information is conveyed to employees through documented training modules or guidance documents and retaining training certification for all employees, including temporary employees and volunteers.
4.11	(h) preparing for probable emergency situations exceptional circumstances	The plan for preparedness shall describe a procedure which details probable emergency situations (fire, spill, medical, severe weather) and exceptional circumstances (reportable spill, natural disaster, workplace violence) identification and response, as well as employee training on identification and response. This training should include drills to ensure preparedness. Scenario based training is most effective. The emergency preparedness should be consistent with the certified management system. Examples include: • RIOS 4.4 Emergency Preparedness • ISO 14001 4.4.7 Emergency Preparedness and Response • OHSAS 18001 4.4.7 Emergency Preparedness and Response

Provision 4 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
4.12	Training	All personnel, including permanent, temporary and volunteer staff, shall be trained in applicable environmental, health and safety information relevant to their responsibilities and exposures in the workplace. Training is unique to each facility and determined by applicable environmental, health and safety regulations, as well as identified risks in hazard assessments. Job roles determine who needs the identified training. Frequency of training should include initial and refresher training, as well event driven training that is needed upon witnessing unsafe practices.

Guidance for Provision 5 – R2:2013 Focus Materials

Provision 5 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
5.1	The Focus Material (FM) Management Plan – tracking and illustrating the flow of FMs through to final disposition	The FM Management Plan must indicate how FMs are identified and tracked from entry into, and movement through the facility, on through each downstream vendor in the Recycling Chain (see definition of "Recycling Chain" in the Definitions Section of the Standard). A flow chart, or similar methodology, should be included as part of the plan and should reflect all subcontractors' and downstream vendors' facilities used for the entire audit period from receipt of each type of FM to the end processor. When the following FMs have reached the state described below, they may be interpreted as having completed the recycling process: • CRT Glass – requires no further processing (final form) to be used as an effective substitute for a commercial product or as an ingredient in a new product in accordance with the following: – If CRT Glass is being processed to separate lead and other composites, then it is a FM until separated at a lead smelter or similarly effective operation. – If CRT Glass is being remanufactured in a glass-to-glass recycling operation, then it is a FM until frit, panel glass, and funnel glass are separated and cleaned of

Provision 5 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
		phosphors. – If CRT Glass passes a TCLP with <5 ppm lead, then it is not an FM – Final products from recycled CRT Glass should be evaluated for consistency with the recycler's FM management plan. Example: if the FM management plan states that CRT Glass is recycled in glass-to-glass recycling processes, then the recycler's due diligence should ensure that the final processing is not, for example, smelting, or deep well injection for fracking, or any form of land disposal. • Mercury containing items – recovered commodity grade liquid mercury from mercury retort (unless alternative management is required by law). Although additional distillation of liquid mercury may be performed, it is not cause for continuing to track mercury beyond the retort process. • Circuit Board – metals recovered and refined to a state that makes them sellable for remanufacturing (which could include additional steps of refining the metals to meet particular commodity specifications). This is commonly in a bar or ingot form comprised of metals. • Batteries - metals and other materials recovered and refined to a state that makes them sellable for remanufacturing (which could include additional steps of refining the metals to meet particular commodity specifications). Common metals recovered include Cadmium, Nickel, Cobalt, and Lead. • Polychlorinated biphenyl-containing items (PCBs) – destruction in accordance with regulatory requirements. Processors may recover the metals in the housing of products, but the PCB material must be tracked to (legal) incineration or landfill. As stated above, tracking throughput shall extend for FMs through the entire Recycling Chain, not just through the R2 facility's own processing. Although order-by-order tracking of material flow through downstream vendors is not required, recyclers shall demonstrate there is a process in place for throughput tracking of FMs through the Recycling Chain.

Provision 5 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
5.2	Downstream requirements outlined in this provision are not required in some instances for reuse equipment as described in Provision 6	Equipment that is diverted for reuse and satisfies Sections (c1), (c2) or (d) of Provision 6 (or are new and in original packaging) does not need to conform to the downstream requirements of this provision. However, this does not mean that all equipment sent to a certified R2 electronics recycler is exempt. As stated in Provision 6, this only applies to equipment legitimately sent for reuse, repair, refurbishment, or remanufacturing. If equipment condition or packaging is consistent with material recovery rather than reuse, then all requirements of Provision 5 shall apply. Furthermore, equipment exported for reuse must have a legitimate reuse market, be current technology for the market, and be in reusable condition.

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
5.3	(a) what the FM Plan must cover	The FM Management Plan must describe the mechanisms and procedures that assure FMs are properly managed on-site and by each downstream vendor throughout the Recycling Chain. The FM Management Plan may reference relevant portions of the EHSMS, for example work instructions and procedures for identifying and processing FMs.
5.4	(b) removal of FMs	Steps required to remove FMs using safe and effective mechanical processes, or manual processes prior to shredding, need to be spelled out in the FM Management Plan. Focus materials should be individually identified and referenced in the Standard Operating Procedures (SOP's) for both mechanical processes and material tear down processes and referenced to the applicable section in the FM plan where removal procedures, associated hazards, and proper handling procedures are described.
5.5	(b) Print cartridges	Print cartridges should be removed prior to shredding due to the risk of explosion.
5.6	(b) 1&2	Bulbs should be removed before shredding. This saves the need for additional hygiene monitoring and the possibility of mercury-contaminated equipment and filters (see next comment).

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
5.7	(b)(1) in the rare event that mercury-containing devices cannot be removed prior to on-site shredding or materials recovery	If mercury-containing devices are deemed to be too small or fragile to remove safely prior to materials recovery, in the FM plan the recycler shall: • Identify and document which devices qualify for this exemption, why they qualify, and describe the process used to assure conformance with all the requirements of Section 5(b)(1). Examples of documentation could include a time study demonstrating how long it would take to safely remove that device and why that makes it economically unfeasible. • Describe and document how workers are protected from the risks posed by the mercury remaining in the items during any materials recovery. • Present evidence that the devices are being processed downstream by mercury retorters that are properly licensed and have the appropriate technology for managing the mercury. Evidence can be presented through downstream vendor audit reports that include process flow summaries and compliance review.
5.8	(b)(2) with respect to shredding CRTs	"Shredding and/or materials recovery" as used in the context of (b)(2) include any form of breakage, cutting, and separation of the glass in CRT monitors. Recyclers shall demonstrate what type of controls and monitoring is in place that is commensurate with the risks of the activities performed.
5.9	(c) downstream vendors for FMs	R2 recyclers shall verify that all downstream vendors in the recycling chain as well as the final materials recovery facility maintain all necessary permits and operating licenses as well as evidence that appropriate procedures and technologies required in (c) (1-4) are utilized. These permits and licenses must be current and valid. It is recommended that recyclers establish a system for annually checking-in with all downstream vendors to verify updated permits to ensure all records continue to be current.
5.10	(c)(1) destination of mercury-containing equipment and components	All mercury-containing equipment and components shall be recycled at a licensed mercury retorter (unless otherwise required by law).

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
5.11	(c)(2) removal of mercury and batteries from circuit boards	Recyclers must review applicable exporting/importing legal requirements. Example: in the U.S., mercury and batteries from circuit boards must be removed prior to shredding in order to comply with hazardous waste exclusions, even if the smelter has the technology designed to safely and effectively manage the mercury and batteries left on the circuit board.
5.12	(c)(2) treatment of small fractions of circuit boards	Sometimes small fractions of circuit boards remain in shredded plastics and shredded steel, and it is not always economically feasible to remove all circuit board fractions. The presence of small amounts of shredded circuit boards in other non-FM commodity streams is acceptable so long as the commodities are being handled at a processor that can safely and legally import and consume the de-minimis amount of shredded circuit boards in new product manufacturing. Example: steel mills which consume ferrous metals can usually consume de-minimis amounts of circuit board fragments. "De-minimis" is defined as the amount that is not removed by an acceptable circuit board removal/processing technology. See the guidance for the definition of "Focus Material" for further information. De-minimus may never exceed the applicable regulatory requirements for classification as a hazardous waste and imports/exports must remain in compliance with importing, transit and exporting regulations.
5.13	(c)(3) management of PCB containing items	Items containing polychlorinated biphenyl, also known as PCBs, shall be separated from all other materials at the facility and managed appropriately according to the FM Management Plan and applicable law. PCBs may be found in products such as cooling fluids, light ballasts, capacitors and older types of computer equipment and televisions. PCBs were restricted in manufacturing in 1979. In general, most equipment containing PCBs were manufactured before 1979. However, manufacturers were permitted to use remaining stocks of PCBs after 1979 and there are still specific permitted applications of PCBs. Due to older televisions still in the waste stream, employees should be trained on PCB identification, storage and shipping requirements.

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
5.14	(d) documented rare and extreme circumstances disrupts normal FM management practice	It is not acceptable for FMs to be managed through energy recovery, incineration or land disposal. In the event of documented extreme and rare circumstances beyond the control of an R2 recycler, FMs may be required by regulatory officials to be disposed in properly permitted hazardous waste facilities or landfills. Again, this is not to be a normal management strategy for FMs and is to only be used in the event of an unforeseeable event or accident (e.g., shut down of CRT glass furnace; 100 year flood; tornado; tsunami; severe natural occurrences) and not for economic feasibility. See Guidance for Provision 5 for additional information about acceptable management methods for FMs. A recycler must maintain documentation showing it has exhausted all recovery options before seeking disposal options allowable under the law. If it can be determined that a disruption in the marketplace is likely short-term (less than 90 days), recyclers should temporarily store FMs on-site, if possible and to the extent allowable under the law, until recovery options become available. If a recycler is forced to dispose of FMs because recovery options become unavailable for the long-term, recyclers need to demonstrate they exhausted all known recovery options. This includes retaining documentation of efforts to find alternative downstream vendors for the material.
5.15	(e) selection of downstream vendors	For an R2 recycler to show that it is conforming to Section 5(e), it needs to obtain from its 1st tier FM vendors documentation that will enable its R2:2013 auditor to reasonably conclude that each 1st tier vendor possesses or conforms to Sections 5(e) (1)-(7). Note that a completed questionnaire alone is not sufficient evidence of "auditing" a downstream vendor. Also, an R2 recycler needs to provide its R2 auditor with evidence that will enable the auditor to reasonably conclude that each 2nd, 3rd, (and 4th, etc.) tier downstream vendor for FMs possesses or conforms to Sections 5(e) (1)-(7). This can be demonstrated by having a system in place ensuring all downstream vendors are contractually required to apply R2:2013 principles, including the requirements for auditing their downstream vendors for FMs. If using this method, language in the contracts must require all contracted downstream

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		vendors to hold their downstream vendors to the principles of R2:2013. Use of such language must ensure that R2:2013 requirements are enforced throughout the downstream, but is not alone sufficient evidence of downstream due diligence to meet Section 5(e). To audit that such a procedure is in place for ensuring downstream vendor conformance to R2:2013, the auditor should request copies of the downstream audit reports to verify that the audits have occurred, review the audit protocol used, and ensure contracts with reference to adherence to R2:2013 are in place. The scope of the downstream vendor audits should include a robust EH&S compliance review, elements of the Focus Material requirements (and other R2:2013 requirements as applicable), and evidence that similar subsequent downstream auditing of subsequent tiers is required and actually occurs. Downstream vendor audits or desk reviews for Tier 1 vendors must be reviewed by the CB auditors for conformance to the FM Management Plan. If less than 100% of the downstream audits or desk reviews of Tier 1 FM vendors have been completed this would result in a major nonconformance, and the company could not be recommended for certification to R2:2013 until these were completed. See Appendix C, Example On site Audit Decision Tree, for an example of when on-site audits of downstream vendors might be necessary. The recycler is responsible for confirming that their material goes to the destination recycling facility. Brokers are not considered a destination recycling facility.
5.16	(e) clarification of selecting both domestic and international downstream vendors	R2:2013 does not require recyclers to select BOTH domestic AND international downstream vendors. Recyclers may use domestic AND/OR international downstream vendors.
5.17	(e)(1) conform to the R2 Recycler's FM Management Plan	R2 recyclers shall select downstream vendors that conform to the recycler's FM Management Plan. For example, a recycler's FM Management Plan (FMMP) may state that the recycler only uses CRT glass-to-glass recycling. A downstream R2 certified recycler may use other forms of CRT glass processing which conform to its own FMMP. Thus, in the due diligence of that downstream vendor processing CRT glass (or Tier 2, Tier 3, etc.) the

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		upstream R2 recycler cannot accept R2 certification of the downstream vendor alone as conformance to their own FMMP. As evidence of consistency with the FMMP, an up-to-date material flow chart may be used to show the management of all FM's handled by the recycler and its downstream tiers throughout the Recycling Chain. R2 recyclers shall also demonstrate how they monitor downstream vendor performance.
5.18	(e)(2) A documented system to manage environmental, health and safety and legal requirements	Downstream vendors handling FMs must have a documented EH&S Management System. The EHSMS does not need to be certified, but must contain sufficient elements of an EHSMS to adequately mitigate EH&S risks appropriate to the vendor's operation. The vendor should have the following: 1. Documented applicable EH&S legal requirements; 2. Copies of all required permits; 3. Emergency Response Plans; 4. Health & Safety Programs; 5. Environmental Management Programs; and 6. Assigned responsibilities for EH&S elements.
5.19	(e)(3) copies of environmental permits	The R2 recycler may maintain copies of the downstream vendor's environmental permits or state they reviewed permits in a downstream vendor on-site audit report.
5.20	(e)(4) each facility in the recycling chain conforms to Sections 5(e) (1)-(7).	The R2 recycler should request cover pages of the downstream vendor's downstream vendor audit reports or state they reviewed the audit report in a downstream vendor on-site audit report.
5.21	(e)(7) - Provision 7 (Tracking Throughput)	The R2 recycler should demonstrate that each 1st tier vendor and its subsequent tier vendors handling FMs, per Section 7(a) on tracking throughput, "maintains for at least three years commercial contracts, bills of lading, or other commercially-accepted documentation for all transfers of equipment, components, and materials into and out of its facility, as well as for any brokering transactions."
5.22	(f) regarding R2 certified downstream vendors	If a downstream vendor holds a current R2:2013 certificate, downstream due diligence still needs to be performed, though the process may be greatly expedited. The recycler should maintain a current R2:2013 certificate for the downstream vendor. The recycler must conduct a review of an R2:2013 certified downstream vendor's own FM Management Plan

Provision 5 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		(5.e.1) and Section 5(e)(7) should be evaluated based on the material type sent to the downstream and the tracking of that material through subsequent downstream vendors to final processing.
5.23	(h) regarding non-focus materials requiring specific management	Print cartridges (loose and removed from electronics) should be handled, stored and shipped in a manner conducive for reuse. Print cartridges should not be managed through energy recovery, incineration and land disposal, unless a customer directs otherwise or they are unrefurbishable. Section 5(e) due diligence is not required for print cartridge remanufacturers, recyclers or Original Equipment Manufacturers (OEMs). Print cartridge remanufacturers, recyclers or OEMs may utilize energy recovery, or proper land disposal after reuse options have been eliminated, although plastic recycling is preferred.

Guidance for Provision 6 – Reusable equipment and components

Provision 6 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
6.1	Legitimate reuse	Handling, packaging, and price are key differentiators between legitimate “reuse” and “recycling”. Equipment destined for reuse will be handled with extra care to avoid breakage and damage throughout the recycler’s process and transportation. Also, the price paid by the recycler for equipment purchased and the price received for reuse equipment sold by the recycler must be in line with market conditions for similar equipment. Reusable equipment is typically priced by unit, whereas recyclable material is priced by weight. A recycler should consider the use of a “Bill of Sale” to establish transfer of ownership for assets being reused.

Provision 6 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
6.2	Reuse testing and evaluation	All equipment destined for reuse must be properly tested and evaluated prior to shipping. Equipment should be evaluated and shipped in one of the following three categories: 1. Tested for Full Functions, R2/Ready for Reuse; 2. Tested for Key Functions, R2/Ready for Resale; 3. Evaluated and Non-Functioning, R2/Ready for Repair Once identified, equipment or components should be labeled with the appropriate category on shipping papers and/or contractual documents.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
6.3	(a) customer elected restrictions on reuse	Recyclers shall be able to show where in the EHSMS customer (providing equipment for recycling) restrictions on reuse are tracked and how those restrictions are executed.
6.4	(b) no mixed shipments	Equipment and components that have met all criteria of this provision and are being shipped for reuse shall not be shipped in the same box, Gaylord, pallet, or other form of packaging as non-reusable items. The labeling scheme for the control of equipment that has been tested and diverted for reuse shall be distinctly different from the labeling used for non-tested equipment.
6.5	(c) "identify each shipment"	To "identify each shipment" means to label or describe on an invoice the condition of the material in one of the three categories. Shipping documents or invoices should include one of the following statements: • Tested for Full Functions, R2/Ready for Reuse; • Tested for Key Functions, R2/Ready for Resale; or • Evaluated and Non-Functioning, R2/Ready for Repair If multiple categories are shipped in the same shipment, then the items need to be clearly distinguished.
6.6	c(1) Tested for Full Functions, R2/Ready for Reuse	"Tested for Full Functions" means that the unit is working correctly or as expected in every way. Fully functional means ALL functions are working as if the unit had been shipped directly from the manufacturer.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
6.7	c(1)A Effective Testing Methods for Full Functionality	The recycler shall be able to show documentation describing what the appropriate full functionality testing is, by product type, and what a passing result would be to determine the that unit is working properly. Example: a table similar to the PACE draft guidance document for *Functionality tests for used computing equipment*.[2] A recycler or downstream refurbisher shall be able to provide records that indicate both the test procedures used, and the results of those procedures on all equipment sold under c(1) Tested and Full Functions, R2 Ready for Reuse.
6.8	c(1)A Properly Configured	The recycler shall properly configure the unit with legally licensed software (where required for operation of the equipment). A recycler must demonstrate that they hold the appropriate licensing agreements. Examples: the Microsoft Registered Refurbisher and Microsoft Authorized Refurbisher programs. The recycler shall also load any device specific drivers within the product's hardware.
6.9	c(1)B and c(2)B Quality Assurance Plan and policy	Recyclers who manage reusable equipment and components are required to have a written Quality Assurance Plan and policy, or maintain current certification to RIOS or ISO 9001. A Quality Assurance Plan and policy may include the following: • Responsibilities; • Functionality testing protocol, including policies for grading equipment or components based on functionality and/or cosmetic defects; • Source control for purchased products used in the final product (e.g., purchased hard drives to be installed in computer); • Quality control inspections after testing, including instructions on handling errors; • Calibration of testing equipment; • Employee training and required qualifications; • Required documents and records; and

[2] PACE document on functionality tests for used computing equipment, pp. 45-46. See http://www.sustainableelectronics.org for the most current link to this document.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		• Product Return Plan, including procedures for handling returns, documenting returns, product re-testing and corrective actions.
6.10	c(1)C and c(2)D written Product Return Plan	Recyclers who sell material in the "Tested and Full Functions, R2/Ready for Reuse" or "Tested for Key Functions, R2/Ready for Resale" categories shall develop a written Product Return Plan. A Product Return Plan may include the following: • Warranty/Return Policy (warranty days per type of product); • Return notification handling, including handling of calls and emails, RMA's issued; • Procedures for processing returns; • Procedures for documenting returns; • Procedures for product re-testing and certification; • Procedures for corrective actions; and • Procedures for refunds and credits.
6.11	c(1)D clean and free of major cosmetic defects	The Quality Assurance plan should include cleaning instructions and definitions of "major cosmetic defects" by product types (i.e. laptops, monitors, computers. etc.)
6.12	c(1)E, c(2)E and c(3)C meets the requirements of the recipient	The recycler could demonstrate conformance through a recipient purchase order or order confirmation. Any exceptions from the original order, must have documented acceptance by the recipient. Example: An accepted sales order, sales contract or MOU.
6.13	c(2) Tested for Key Functions, R2 Ready for Resale	"Key Functions" is defined in R2:2013 as "the originally intended functions of a unit of equipment or component, or a subset thereof, that will satisfactorily serve the purpose(s) of someone who will reuse the unit." "Key Functions" are made up of primary and secondary functions. If the primary function of the equipment is not working as originally intended, then the secondary function(s) must be fully working in accordance with the buyer's intention for reuse. The seller must clearly understand the buyer's reuse intention, advertise/document for that use, and maintain records demonstrating tests to show functions working in accordance with the buyer's requirements in order to satisfy Section 6(c)(1). Example: A smart phone that has all functions critical to communication in working order,

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		but lacks some secondary function like a camera, would be considered to have key functions functioning properly.
6.14	c(2)A Effective Testing Methods for Key Functionality	The recycler shall be able to show documentation describing what the appropriate key functionality testing is, by product type, and what a passing result would be to determine the that unit is working properly. Example: A table similar to the PACE draft guidance document for *functionality tests for used computing equipment*.[3] Simply powering-on the equipment may be a test of some key functions, but alone it may not test for all key functions. Example: It would be inadequate as a test for a complete desktop or laptop computer. However, a simple power-on test may be effective for some component parts, such as memory. A recycler or downstream refurbisher shall be able to provide records that indicate both the test procedures used and the results of those procedures on all equipment sold under c(2) Tested for Key Functions, R2 Ready for Resale.
6.15	c(2)C "Disclosure in writing to buyers"	The recycler should notify the buyer in writing of any the secondary function(s) that are not working properly. (All key functions must be working properly). The recycler must also describe any cosmetic defects and missing components. This could be documented on an internet listing, bid sheet, invoice or other shipping paperwork.
6.16	c(3)A Quality Assurance Plan and policy	Recyclers who manage untested or non-functioning reusable equipment and components are required to have a written Quality Assurance Plan and policy. The Quality Assurance Plan and policy for untested or non-functioning may include the following: • Responsibilities; • Procedures for evaluation, including visual grading of equipment or components based on cosmetic defects; • Procedures for evaluation based on remarketability, including evaluation that the sale price is consistent with repair in the destination market;

[3] PACE document on functionality tests for used computing equipment, pg. 45-46 . See www.sustainableelectronics.org for the most current link to this document.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		• Functionality testing protocol, including policies for grading equipment or components based on functionality; • Employee training and required qualifications; and • Required documents and records.
6.17	c(3)B Confirm through an appropriate combination of contractual agreements, detailed material tracking, recordkeeping and auditing	Recyclers shall maintain a list of companies to which the recycler sells untested, potentially reusable equipment and components to, and documentation verifying requirements of (c)(3)(B). "Contractual agreements" could include purchase orders, bills of sale, or statements of work from the entities receiving shipments of untested reusable equipment and components. This only refers to the untested equipment and components that are going to be repaired or refurbished off-site. "Detailed material tracking" could include inventory of units shipped to a downstream refurbisher and a corresponding list of passed and failed units received back from the downstream refurbisher. "Auditing" could include a desk audit of the downstream refurbisher's testing procedures or an on-site audit of the downstream refurbisher.
6.18	c(3)B(i) only ship to R2:2013 certified recycler	If the recipient vendor of equipment for reuse, repair, refurbishment, or remanufacturing is an R2:2013 certified electronics recycler, the shipper will be exempt from the requirements of (c)(3)(ii) and (c)(3)(iii). When equipment condition, handling, packaging, and pricing are not consistent with potential reuse, then this exclusion will not apply. Example: Equipment loosely placed in Gaylords with no individual protection typically are not being sent for reuse.
6.19	c(3)B(ii) recipient vendor conformance	R2 recyclers need to confirm that the recipient vendor performs reuse and refurbishing activities to ensure the material meets c(1) Tested and Full Functions, R2/Ready for Reuse, or c(2) Tested for Key Functions, R2 Ready for Resale. As stated in the comment 6.16 referencing c(3)A, this could be accomplished through a combination of contracts including relevant R2:2013 requirements, desk audit of testing procedures or an on-site audit witnessing the testing processes.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
6.20	c(3)B(ii) management of residual FMs resulting from refurbishing	R2 recyclers need to confirm that the recipient vendor performing reuse and refurbishing activities manages all FMs that result from those activities in accordance with FM management requirements detailed in Provision 5 and that all subsequent tier vendors in the Recycling Chain do so as well. The R2 recycler should have a list of the refurbisher's downstream vendors for residual FMs to ensure conformance to Provision 5.
6.21	(d) "collectible" and "specialty electronics" exemption	"Collectible Electronics" includes items that are rare, vintage, and that are a type of device no longer manufactured or supported by original manufacturers. "Specialty Electronics" are rare and specialized equipment that is not generally available in retail. Examples: Medical, diagnostic, laboratory, or other devices, which are customized for a specific purpose. Testing on "Collectible and Specialty Electronics" is not required if the recycler does not possess the technical capability to test or repair. However, sales of untested/non-functioning Collectible and Specialty Electronics are limited to 1% of the total tested individual units by quantity sold on a rolling 12-month average. Example: If a recycler sold 1,000 units from January – December 2012, the recycler can sell 10 untested/non-functioning Collectible and Specialty Electronics in the month of January 2013, but then none for the next 11 months, or 1 per month for 10 months.
6.22	(e) exception to Provision 5's downstream due diligence	R2 recyclers do not need to conduct Provision 5 downstream due diligence on buyers purchasing material that meets the requirements of c(1) Tested and Full Functions, R2/Ready for Reuse or c(2) Tested for Key Functions, R2 Ready for Resale. Provision 5 due diligence IS required on all buyers of "Evaluated and Non-Functioning, R2/Ready for Repair" material.

Provision 6 Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
6.23	(e) exception to Provision 3's exporting	R2 recyclers do not need to conform to Provision 3 exporting requirements on shipments that meet the requirements of c(1) Tested and Full Functions, R2/Ready for Reuse or c(2) Tested for Key Functions, R2 Ready for Resale. Provision 3 exporting compliance IS required on all shipment of "Evaluated and Non-Functioning, R2/Ready for Repair" material. This means the recycler shall be able to produce up-to-date documentation consisting of the records required under 3.a.2 demonstrating the shipment is legal in the importing, transit and exporting countries.
6.24	(e) new and in original packaging	Equipment returned under warranty may appear to be in original packaging. If a recycler takes in what is known to be recalled equipment, all reuse testing and screening procedures must be followed. Recalled equipment in the original packaging does not qualify for 6.e exclusions since it is known to be defective.
6.25	(c)1(A) use effective test methods	This could be demonstrated by viewing the refurbisher's procedures and training for testing equipment and quality assurance plan.
6.26	(c)3(B)iii recipient vendor that can manage all equipment and components containing FMs	The R2 certified recycler must choose recipient vendors who meet their FM management plan and R2:2013 export requirements for all unrefurbished and unrepairable equipment or components. Consequently, no selling of untested equipment on e.g. e-Bay is acceptable.

Guidance for Provision 7 – Tracking throughput

Provision 7 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
7.1	The intended outcome of tracking throughput	Tracking throughput shall provide evidence to substantiate the flow and legitimacy of equipment/materials through the recycler's business and downstream vendors. Although order-by-order or customer-specific tracking of material flow through a recycler and subsequent downstream vendors is not required unless required by the customer and there are appropriate intellectual property and commercial controls in place, the total volume flow must prove that the recycler is not diverting material to other sources. Furthermore, the tracking must show evidence clearly differentiating between working equipment, equipment for refurbishment, and recycled materials.

Provision 7 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
7.2	(a) maintenance of throughput records	It is important to account for disposition of all items received in and out of the facility. Tracking non-FMs is only required with first tier downstream vendors. The focus of tracking beyond the first tier is for materials that are more likely to cause harm if improperly managed (FMs). One way recyclers can demonstrate conformance is by producing a mass balance report for the material that moves through the facility during the specific audit period. If a mass balance is used, it should include weights of all materials received and weights of all materials that left the facility and the destination of those materials. The calculation should also account for material diverted for resale/reuse. Material leaving the facility for a specific audit period should be the control total for identifying and balancing the FM material flow. An alternative method of demonstrating conformance (especially for recyclers that do not demanufacture or shred equipment) may be a rigorous inventory system tracking serial numbers of all equipment coming in and going out of the facility. This could also be paired with mass balance for a hybrid system demonstrating thorough control and tracking throughput.

Provision 7 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		It is expected that records of material will clearly demonstrate the flow of material is valid and not diverted in whole or part. Shipping and delivery records to the first tier vendor will be consistent with the R2 recycler's inventory records. R2 recyclers should be able to demonstrate receipt of material by the downstream vendor consistent with the volume and type shipped; even brokers must show receipt of materials by downstream vendor. Furthermore, the R2 recycler should be able to show proof of processing and outputs from processing by downstream vendors consistent with the material shipped, to the extent necessary to demonstrate its facility requirements of Provision 7. The recipients declared on all bills of lading for FMs leaving the recycling facility shall match all of the downstream vendors declared for Provision 5. Likewise, all recipients declared on bills of lading for reused equipment shall match the customers declared for Provision 6. R2 recyclers may take appropriate steps to protect their confidential business information, such as requiring auditors, CB's and customers to sign Non-disclosure Agreements prior to reviewing Provision 7.
7.3	(b) multiple methods of tracking	There are multiple methods for tracking throughput, for instance maintaining a record of shipment identification number, location of harbor and estimated date of export.

Guidance for Provision 8 – Data Destruction

Provision 8 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
8.1	What constitutes data destruction	Recyclers must ensure electronically-stored information is being handled in accordance with all national and state/provincial laws governing data destruction that apply to the recycler's operation. Recyclers shall provide documented proof that they are familiar with national, as well as state/provincial laws that govern data management and destruction, which in some cases can have stronger data management requirements than the national regulations. In addition, recyclers need to conform to the data sanitization, purging, and destruction practices for all defined media listed in NIST (United States National Institute of Standards and Technology) Special Publication 800-88[4], or its most current iteration. It is also acceptable to meet this provision's requirements with a generally–accepted data destruction certification program, such as provided by NAID Certification[5]. Recyclers shall validate data destruction methods and security controls used through independent verification. Independent verification is commonly performed by external parties, although it may be achieved with internal resources in an organization large enough to substantiate independence of the review process. Example: Recyclers in the U.S. also need to manage personal information in accordance with national regulations, such as the Health Insurance Portability and Accountability Act (HIPAA), the Gramm-Leach-Bliley Act (GLBA), and the Identity Theft Penalty Enhancement Act (ITPE) which create safeguards to protect private information.
8.2	Media	Media for the purposes of data destruction is any digital device that holds data in its memory. Examples: Digital copier, printer memory, cd rom, hard drives, data devices in cell phones, video tape, DVDs, and memory sticks.

[4] See www.sustainbleelectronics.org under References and Useful Links to get access to the NIST Guidelines and the NAID document.

Provision 8 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
8.3	(a) acceptable data destruction practices	Acceptable practices for the destruction of data depend on the type of media, the sensitivity of data, customer requirements, and the methods used. For example, it would not be acceptable to shred security video tapes through an equipment shredder that leaves an intact ball of tape instead of small separate pieces of tape. Nor would it be acceptable to only remove the circuit board from a hard drive without impaling the platters. NIST Special Publication 800-88 specifies acceptable methods for data destruction by media type and classification (sensitivity). As new technologies emerge, generally accepted and published industry techniques may be acceptable through the validation process in 8(d). It is acceptable to outsource data destruction or sanitization down one tier in the Recycling Chain (i.e. to the first downstream vendor to receive the electronics data storage devices), and further downstream if required by the customer. The security control between the R2 recycler and the downstream vendor(s) shall be appropriate, clearly documented, and track the data sanitization in accordance with Provision 8. Appropriate security controls for the transport of devices that still contain electronically stored data could include the use of one or more of securable transport containers tamper evident seals, shipment tracking, etc. The nature and sensitivity of the data should be considered when determining adequate security measures during transport. If recyclers receive electronic data storage devices that are supposed to already be sanitized, the recycler shall be able to provide documentation of data destruction prior to receipt and conduct periodic testing of previously sanitized devices to ensure data destruction has been performed.
8.4	(a) customer requests to avoid data destruction	All data storage devices shall be treated in accordance with Provision 8 unless the processor can provide documented proof that a customer requires in writing alternative data treatment or no sanitization at all. However, that requested treatment must not be in violation of state/provincial or national laws governing the management of electronic information.

Provision 8 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
8.5	(b) documenting data destruction procedures	All activities involved in data destruction shall be clearly described and conveyed to employees. All information pertaining to data destruction procedures shall be documented. Documentation should include material handling, labeling, processing, storage, physical security, and validation of results. In addition, certain methods of destruction like degaussing may require equipment calibration and maintenance to ensure effectiveness. Evidence must be generated and maintained to show conformity to the data destruction procedures and effective processing.
8.6	(c) ensuring adequate employee training	All employees involved in the data destruction procedures shall be fully trained. As part of the "training on a regular basis", employees shall receive information about updated data destruction methods and regulatory requirements as they become available. All applicable employee training documentation shall be part of the recordkeeping that is maintained in accordance with Provision 13.
8.7	(d) review and validation of data destruction procedures	The independent review of data destruction procedures shall include validation of the procedures, quality of employee training, calibration and maintenance of equipment, and performance of data destruction methods. The review could be conducted by an independent third-party who has demonstrated expertise in NIST Guidelines, comparable international data destruction guidelines, or data forensics methods. As with any audit, the auditor must demonstrate that he/she is qualified and has the expertise and/or experience to evaluate the recycler's data destruction process. Reviews should specifically include competency evaluations of employees, attempts at data recovery from sanitized devices, verification of calibration schedules, and verification of data sanitization records. Alternatively a recycler could internally perform the review but must thoroughly document the review process and the frequency of the review. However, the person performing the internal review shall not be involved in the daily data destruction process, nor in any way be accountable to the management responsible for data destruction, so that the review can be truly independent. Depending upon the sensitivity of data being destroyed, methods used, type of equipment, and level of expertise in-house, an outside review may be necessary. Recyclers shall produce certificates, or evidence of regular review of data destruction procedures and validation of data destruction methods. For example, disk wiping methods

Provision 8 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		may be validated using commercial software for data recovery to demonstrate no recoverable data on the wiped media. Forensic analysis or any other more rigorous data recovery method would only be necessary if the sensitivity of the data on the media warrants it in line with the NIST 800-88 guidelines. Additionally, physically destroyed media would not require data recovery attempts if the composition and/or size of the destroyed material is consistent with the NIST 800-88 specific guidelines. For example, shredded optical disks must meet a specific particle size. If the recycler's process does not correspond to the minimum size or form requirements of the NIST 800-88 guidelines, then forensic analysis would be needed to confirm the inability to recover data from the media.
8.8	(h)1 "through audits of other similarly effective means"	The "other means" must be documented and approved by the auditor as "similarly effective".

Guidance for Provision 9 – Storage

Provision 9 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
9.1	Appropriate storage of potentially harmful materials	This Provision pertains to the storage of all FMs and reusable equipment as well as potentially harmful products that might be used in or result from the recycling process.

Provision 9 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
9.2	(a) regarding storage requirements for materials that may cause risk to worker health or safety or the environment	The storage methods for potentially harmful material shall be adequate to prevent the release of any materials which could harm worker safety and/or the environment. Storage methods and precautions shall be appropriate to the threat posed by the material being stored and be performed in accordance with all national and state/provincial regulation. Regulations to consider for storage requirements include all national and state/provincial/territory regulations. Recyclers shall review and document all applicable waste regulations and demonstrate they are in compliance with those regulations.

Provision 9 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		For all R2 recyclers, common storage practices for material can include, but are not limited to: 1) storage containers compatible with the contents and kept closed; 2) equipment, components, materials or wastes stored in designated or isolated areas not exposed to potential adverse weather; 3) labeling material or containers in a way that identifies the contents and/or waste classification; and 4) tracking accumulation time and volume.
9.3	(a) regarding storage requirements for equipment and components going to reuse	Reuse equipment and components will be clearly labeled as to the condition of equipment to separate reuse electronics from recycled material. Equipment destined for reuse must also be stored to protect it from damage and theft. For example, it would be more appropriate to store LCD monitors for reuse in a small box with each screen protected by cardboard or bubble wrap, than it would be to store like LCD monitors for recycling in a large Gaylord box. Equipment destined for reuse must never be stored outside where it is further subjected to environmental conditions like rain, heat, cold, snow, etc. Equipment and components destined for resale must be stored in areas secure from unauthorized access. For example, unsecured, open roll up doors with direct access to the street or employee parking areas may be monitored via CCTV systems.

Guidance for Provision 10 – Facility security

Provision 10 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
10.1	Adequate security	Electronics recyclers shall provide facility security that is commensurate with the risk associated with the equipment being handled and the information stored on the devices. High value parts, FMs, and all data-containing devices in particular must have appropriate security controls in place. Minimum security controls shall include a controlled access area, or off-limits area accessible only by authorized employees, or visitors escorted by an authorized employee. The controlled access area may be the entire facility or a physically separated and secured portion of the facility. Evidence is required to document access in and out of controlled areas. All devices containing electronically stored information shall be kept in the controlled access area(s). Additional security measures should be taken based on the identified level of risk.

Provision 10 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
10.2	(a) controlled access	Controlled access requires intentional barriers to entry and documenting of entry/exit by personnel and visitors. Security controls will consist of both engineered and administrative techniques. Examples include: • Badge access systems; • Security logs; • Visitor passes; • Video surveillance; • Dock door gates; • Locked doors; • Security fence; • Metal detectors; • Dedicated security personnel; and • Employee background checks. If a security breach does occur, the recycler shall document and evaluate if the current security program is adequate and shall take appropriate steps to prevent future compromises.
10.3	(a) a degree appropriate given the type of equipment handled and the needs of the customers served	Recyclers shall secure all data containing devices from theft by both internal and external parties. Recyclers should also consider the value of reusable equipment and the security appropriate to protect valuable equipment from theft. Additional security will largely be determined by requirements of customers served. Multiple levels of security within the facility may be one method for meeting varying degrees of security. Consider access to the property, the facility, rooms within the facility, and storage cabinets within the rooms as points to differentiate security.

Guidance for Provision 11 – Insurance, closure plan, and financial responsibility

Provision 11 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
11.1	Evaluating risk assessment	Provision 11 is designed to create a mechanism to mitigate the consequences of on-site accidents or unforeseen closure of the facility. To determine how to adequately provide for these situations, a thorough risk assessment shall be conducted to determine sufficient insurance coverage and assets required to perform actions in the closure plan. This evaluation shall be clearly documented. The closure plan shall contain a clear, written timeline and tasks with a clear, written outline of the persons responsible for each action in the event of a closure/abandonment. Based on the risk assessment, it may be determined that pollution liability insurance is not necessary for some very small facilities depending on their types of operations.

Provision 11 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
11.2	(a) adequate insurance coverage	Insurance levels shall be adequate to cover injury claims that might result from activities that take place on or off-site. Commercial General Liability Coverage covers bodily injury, property damage, accidents, and other emergencies. The minimum "adequate" level of Commercial Liability Insurance in the United States shall be considered $1,000,000 per occurrence. This may vary in other countries or regions. A determination as to whether or not a recycler needs a Pollution liability policy, and the amount thereof, should be made by a Commercial Field Underwriter or Risk Manager in the insurance field. It is up the recycler to inform the insurance personnel of their environmental, health and safety risks. Volume, types of accepted material, methods of material storage and processing technologies are major drivers in requiring additional coverage. Recyclers shall possess valid certificates of insurance, with explanation of coverage, for all applicable coverage. It is recommended that the R2 recycler be named on downstream vendors' policies as "additional insured" entities.

Provision 11 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		Auditing of insurance coverage will vary by policy. Commercial General Liability coverage in the U.S. is regulated by states and therefore standardized in language and coverage. Typical amounts are $1 million U.S. dollars per occurrence and $2 million per aggregate. Auditors must verify coverage is current, but do not need to verify language within the policy. On the other hand, the need for, or amount of, pollution liability policies should be further scrutinized to ensure the language in the policy follows the pollution liability guidelines. The recycler should be able to demonstrate that the facility has had an evaluation by a Commercial Insurance Underwriter or Risk Manager.
11.3	(a) Pollution Liability Insurance	Pollution liability policies cover both the recycler's customers (upstream) who provide material, and the recycler from improper practices of downstream vendors (though see 11.1 above). Regardless of indemnification language in contracts, downstream vendors may still be liable for pollution. Unlike other insurance policies, pollution liability insurance is not "admitted" and not subject to state regulation. Consequently, pollution liability policies vary greatly in coverage and exclusions. The following practices should be included in coverage in some form or fashion: 1. NODS – Non-owned disposal site liability coverage. This covers liability for waste improperly disposed by other vendors at other locations. 2. Additional Insured – this can be blanket coverage which states that all customers are "additional insured" on the policy where specified by customer contracts. Customers may also be specifically named as "additional insured" on the policy. This will insure that the recycler's pollution liability policy is exhausted before the customer may be financially responsible. 3. Blanket coverage of all recycling/disposal outlets which are properly licensed, not bankrupt, and not currently known to be polluted (In the U.S. this would include sites not on the EPA's National Priorities List – NPL). Note that the policy would typically exclude sites that do not meet these criteria. Consequently, it is important to continue to conduct due diligence even with pollution liability coverage. 4. Endorsement for coverage during transportation of material by recycler or third party.

Provision 11 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
11.4	(a) Additional Insured	Although not specifically mentioned in the R2:2013 Standard, the customary practice in the insurance industry utilizes the term "Additional insured" with most insurance policies. This section explains how the concept applies to recyclers. "Additional insured" is the correct wording, and should never be "named insured", "additional named insured", "additionally insured", or anything other than "additional insured". The customer of a recycling vendor may ask to be named as an "additional insured" on the recycler's Commercial General Liability (CGL) and Contractors Pollution Liability policies. This adds the customer to the recycler's policy, but only to the extent of any indemnification obligations the recycler already has to the customer. Example: If a recycler is hired by Company A to pick up product at Company B, and somehow hurts a Company B employee or causes damage to the property, Company B will look to Company A for indemnification. Company A will in turn look to the recycler, since the recycler is 1) the cause of the damage; and 2) contractually obligated to Company A to indemnify them for the damage they caused. Company A will then look to the recycler's insurance to protect Company A and to pay damages to Company B. Additional insured status does not provide Company A any additional coverage. It does not add Company A to the recycler's policy for things that do not relate to the contract. In other words, if a customer slips and falls on a Company A's site, and that has nothing to do with the recycler, there is no coverage for Company A under the recycler's policy.
11.5	(b) considerations for a sufficient financial instrument	A closure plan shall contain an estimate of what it would cost to close the facility, and show a mechanism for covering that cost outside of insurance. A sufficient financial instrument must be adequate to cover the calculated costs to close the facility and return the building and site to a sellable or leasable state. This includes providing for the removal, and appropriate management (satisfying the requirements of R2:2013) of all end-of-life equipment and materials resulting from recycling activities using an assumption that they have zero value. If there is known on-site environmental contamination which has not been addressed, the financial instrument shall be appropriately funded to cover the cost of this clean up. Examples of financial instruments: a trust fund, surety bond, or letter of credit.

Provision 11 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		Someone other than the owners must have access to this financial instrument as abandonment assumes the owners are not part of the closure process. Assets intrinsic in the facility (not customer equipment/materials) can be considered sufficient to finance the closure so long as: 1) the recycler has detailed the market value of the equipment (less the remaining book value); 2) the market value determination is deemed adequate to cover the closure costs and is updated annually; and 3) the recycler has designated who would be responsible for the liquidation of assets in the event of site abandonment (i.e., a third party separate from the recycler). If this mechanism is used, the closure plan must state that all money from the sale of assets shall first be put toward returning the facility to the original state, and it must identify the responsible party that will facilitate the closure process. Use of assets may not be acceptable under applicable law in some jurisdictions, in which case the R2 recycler must comply with the applicable legal requirements.
11.6	(b)3 elements of a closure plan	In addition to the overall plan for shuttering and removing all equipment being stored for recycling and the materials resulting from recycling activities, the closure plan shall include the following: • Contact information for those responsible charged with performing duties outlined in the closure plan. • Description and evidence of assets and resources to cover all financial obligations resulting from closure activities. In the United States, reference 40 CFR 264.111 for closure performance standards. Other countries may have closure performance standards.

Guidance for Provision 12 – Transport

Provision 12 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
12.1	Transportation requirement	The same transportation requirements shall apply to all shipments arranged by a recycler whether transported by: 1. The recycler who owns or rents/leases equipment for transportation of product. 2. A third party transporter – any freight carrier hired for transportation by the recycler or the recycler's agent to transport used electronic equipment. 3. A logistics provider – any company who arranges transportation for a recycler but does not provide transportation equipment or directly employ the drivers of that equipment; e.g., broker or freight forwarder. 4. Any combination, such as a third party transporter carrying the freight to a merge center from where it is then carried by one or more external carriers to the final destination.

Provision 12 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
12.2	(a) appropriate packaging methods	All equipment and materials shall be packed and stacked in a manner that prevents them from falling over or breaking apart during transit. Coordination with the logistics provider or transporter is advised to ensure appropriate packaging methods prior to pick up. Some materials (e.g. certain loose rechargeable batteries) pose particular hazard for transporters if not packaged appropriately and in accordance with regulations. Where material may be exempt from environmental regulations, it still may be covered by transportation regulations restricting the packaging, labeling, and mode of transportation. In the United States, this may include hazardous material regulations under 49 CFR. Reusable equipment shall be packaged appropriately to protect it from damage during shipment. There should be a clear difference between the packaging of recyclable and reusable equipment.
12.3	(b) ensuring transporters meet all legal requirements	The recycler is responsible, directly or indirectly through a logistics provider, to ensure documentation demonstrating adherence to regulations is evaluated, current, and maintained for each transporter. Whether transportation is provided by the recycler, a third party transporter, or through a logistics provider, the same level of compliance is required. Through a contract with a logistics provider and a review of the logistic provider's records

Provision 12 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		and procedures, a recycler could outsource to the logistics provider this function. However, it is the responsibility of the recycler to ensure conformance and provide evidence that the logistics provider is performing the necessary checks to meet the requirement. If recyclers require buyers to arrange for transportation, and buyers take control for the material at the seller's dock (aka "FOB Origin" or "FOB Shipping Point"), the recycler is not subject to Provision 12. Recyclers shall have all necessary records for each third-party transportation service provider demonstrating authorizations to operate for the material transported and the locations where transportation occurs. In the U.S., one may start validating this information through the U.S. Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA), Safety and Fitness Electronics Records (SAFER) system[6]. Records may include a certificate or license granting authority to operate. It may also include a hazardous materials certificate if applicable. Recyclers shall consider the movement of the material and the potential operating authorization required by region or country. The recycler shall demonstrate awareness and adherence to all regulations covering the transportation of materials received and shipped by the recycler.

[6] SAFER can be accessed at http://safersys.org. "Company Snapshot" is the standard search for general information about a transporter. Please see www.sustainableelectronics.org (References and Useful Links section) for the links to USDOT and FMCSA websites.

Guidance for Provision 13 – Recordkeeping

Provision 13 - General Guidance		
Comment No.	**Area of the Standard**	**Guidance**
13.1	Centralized recordkeeping	Any combination of electronic and hard documents can be maintained in a centralized recordkeeping system and can be used to demonstrate conformance to the provisions of the Standard. Records must provide evidence of ongoing conformance to each provision of the Standard, including use of the EHSMS and FM Management Plan.

Provision 13 – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
13.2	(a) regarding centralized recordkeeping	Records must be accessible from one location, whether in hard copy or electronic form. Files may be maintained on remote networks and drives; however access to that information must be possible from the designated recordkeeping location. Documentation of effective dates and revision tracking must be clearly identified on all electronic and hard copy files. The auditor shall be able to perform all necessary document review to verify conformance to R2:2013 from one location.

Definitions

Definitions – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
D.1	Accredited Certification Body	This means a Certification Body (CB) that has been accredited by ANAB in North America, or another accreditation body elsewhere in the world that meets ISO/IEC Standard 17021 and has been approved by SERI. ANAB Accreditation Rule 34 defines the requirements for Certification Bodies to be accredited to audit for R2:2013 under ANAB. A list of Accredited Certification Bodies for R2:2013 can be found on the SERI website.[7]
D.2	Collectible Electronics	Examples include: polaroid cameras, antique/vintage record players, parts for vintage electronics equipment, rotary dial phones, etc.
D.3	Downstream Vendors	When "downstream vendor" is used in the Standard, it refers to all tiers of downstream vendors in the Recycling Chain, such as brokers, repairers, refurbishers, and recyclers.
D.4	Electronic Equipment	The scope of R2:2013 does not reach to white goods, household appliances, medical equipment, or automobiles that may contain electronic equipment. However, if electronic equipment is removed from those goods at an R2 certified facility, or are accepted at an R2 certified facility, these electronic components shall be handled in accordance with R2:2013.
D.5	R2:2013 Focus Materials "de-minimis"	The term "de-minimis" does not refer to an absolute or specific amount. Rather, it refers to the amount one would reasonably expect to remain following the utilization of "safe and effective mechanical processing or manual dismantling". This will vary based on the technology employed. The conditions for acceptable de-minimis amounts of FM's in a non-Focus Material product are: • Technology or technique of separation is determined to be practicable and effective in removing Focus Material. • Non-Focus Material product, such as metal or plastic, can be consumed directly into the manufacturing process without further separation of the de-minimis FM's. • De-minimis amounts of FM's are not intentionally combined with Non-Focus Materials.

[7] www.sustainableelectronics.org

Definitions – Clarifications		
Comment No.	**Area of the Standard**	**Guidance**
		• The general ratio of FM fragments remains in line with machine or industry standards. Examples of such technologies that can practicably and effectively remove circuit boards from mixed shredded material include optical sorting systems, shaker screens, eddy currents, and other automated sorting technologies that create a nearly circuit board-free stream of material. Minor fragments of circuit boards may not be registered by sensors in this equipment. Alternatively, mechanical breaking systems or manual breaking may leave small corner fragments of circuit boards attached at the screws. This can also yield a nearly circuit board free stream of material that would meet the "de-minimis" threshold for FMs. It is also important to note that all FMs removed during recycling and refurbishing activities remain FMs throughout the Recycling Chain until they reach their final disposition, such as batteries being smelted or mercury being retorted. Circuit boards are not considered FM's if the boards, whole or shredded, do not contain lead solder and have undergone safe and effective mechanical processing or manual dismantling to remove batteries and mercury.
D.6	FM list	To show conformance with the CRT clean glass exception the R2 recycler must show batch testing (quarterly is preferred) for outgoing clean CRT glass.
D.7	FM list (5)	Note: R2:2013 FM definition includes 5 materials, but there are other directives/legal requirements that identify materials that may present environmental and human health risks that should be considered for special care and attention, for examples see RoHS (Restriction of Hazardous Substances, European Union Directive).
D.8	Key Functions	Example: A cell phone where the phone works but the camera does not OR a cell phone where the phone doesn't work but the camera does and it is advertised/sold as a camera. The "someone" referred to in the definition is a typical, reasonable, average end consumer.
D.10	Recycling Chain	The end of the recycling chain for each FM is when it becomes a commodity to make new materials.

Appendix A: Acronyms

ANAB	ANSI-ASQ National Accreditation Board
ANSI-ASQ	American National Standards Institute – American Society for Quality
CB	Certified Body
CCTV System	Closed-Circuit Television
CFR	Code of Federal Regulation
CRT	Cathode Ray Tube
EHSMS	Environmental Health & Safety Management Plan
EPA	Environmental Protection Agency (U.S. Agency)
FM	Focus Material
FMMP	Focus Material Management Plan
FOB	"Free on Board", used in conjunction with port of loading to specify which party (buyer or seller) pays, where responsibility is transferred
HIPAA	Health Insurance Portability and Accountability Act
ISO/IEC	International Organization for Standards/International Electrotechnical Commission
LCD	Liquid-crystal display
NIST	National Institute of Standards and Technology
OECD	Organization for Economic Co-Operation and Development
OEM	Original Equipment Manufacturer
OHSAS	Occupational Health and Safety Advisory Services
PCB	Polychlorinated biphenyl
PELs	Permissible Exposure Limits
QEH&S	Quality, Environmental Health and Safety policy
RIOS	Recycling Industry Operating Standard
TCLP	Toxicity Characteristic Leaching Protocol

Appendix B: Examples of Focus Material Components – Not a complete or exclusive list

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM)[8]
	Power Supply		x					
	Sister Cards		x					
	Motherboard		x	x				
	Optical/floppy drive		x					
	On/off switch (light) on computer		x					
Desktop	Hard drive		x					
	Keyboard	circuit board powers and operates	x					
	Speakers	circuit board powers and operates	x					
	Mouse	circuit board powers and operates	x					
	Printer		x	x				x
	Multi-function Printer/Fax/Copier		x	x		X		x
	External Hard Drive		x					
Peripherals	Uninterrupted Power Supply (UPS)	Lead Acid Battery	x	x				
Monitor	Monitor CRT	Circuit board powers and operates plus leaded glass	x		x			

[8] Toner and ink is not a Focus Material, but does require specific handling under R2 Section 5(c)(4).

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM)[8]
	Monitor LCD	May also have switching power supply (AC Adapter) that is external and has circuit board	x			X		
	Chassis	May contain battery on circuit board in addition to laptop battery.	x	x				
	Screen	May have Mercury back lights in display (not applicable for newer LED screens)	x			X		
	AC Adapter	May also have switching power supply that is external and has circuit board	x					
	Optical/Floppy Drive		x					
Laptop	Laptop Docking station	May also have switching power supply (AC Adapter) that is external and has circuit board	x					
	Switches	Circuit board, may include battery, older may have mercury switch	x	x		X	x	
Telecom	PBX	Lead acid battery for backup systems; may have mercury backlights in screens	x	x		X		
Point of Sale (POS) equipment		Much like computers and monitors with same constituent parts	x	x	x			x
	Sub-Assemblies	Circuit boards w/ battery on board, hard drive w/ board, mercury light	x	x		X		x
	Hard Drive	Contained in some models	x					
Copier	Adapters	Proprietary adapters external to the copier may be part of the device	x					
Hand-Held Devices	Cell Phone/Smart Phone/Pager	May also have switching power supply that is external and has circuit board	x	x				

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM)[8]
	PDA	May also have switching power supply that is external and has circuit board	x	x				
	Cordless Phone & Base	May also have switching power supply that is external and has circuit board	x	x				
	TV CRT	Rear Projection TV's will also contain a Glycol coolant.	x		x			
	TV LCD (CCFL)		x			x		
	TV LCD (LED)	No mercury backlights	x					
Television	TV Plasma		x					
	Stereo equipment	DVD, amps, speakers, etc.	x	x				
	Electric kitchen items	Blenders, toaster ovens, crock pots, food processors, microwaves, etc. with electronic displays	x					
	Electric personal items	Hair dryers, curling irons, razors, etc.	x	x				
	Satellite equipment	Circuit boards and battery on board	x	x				
Consumer Electronics	Telephones and answer machines	Circuit boards and battery on board	x	x				

Appendix C: Example On-Site Audit Decision Tree

The below diagram is an example of logic that may be suitable for determining when to perform an on-site audit in accordance with Section 5(f). This decision tree does not consider discrepancies or concerns found during the audit process that may require further on-site due diligence. On-site auditing is determined by the analysis of evidence provided in the due diligence process. This is only a guideline and adherence to this process flow alone will not ensure conformance to R2:2013 Standard.