BC Lamps and Lighting Equipment Stewardship Plan CONSULTATION DRAFT

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1 INTRODUCTION

The BC Lamps and Lighting Equipment Stewardship Program ("Program"), operating as the BC LightRecycle Program ("LightRecycle"), is an approved stewardship program operated and managed by Product Care Association of Canada ("PCA") since July 2010.

This BC Lamps and Lighting Equipment Stewardship Plan ("Stewardship Plan") is submitted to the British Columbia Ministry of Environment by PCA on behalf of the Producers of lamps and lighting equipment sold in British Columbia who are the members of the PCA program, pursuant to the requirements of the BC Recycling Regulation Reg. 449/2004 ("Regulation").[1] The Regulation sets out the requirements for extended producer responsibility, including the requirement for product stewardship plans. The Stewardship Plan replaces the original stewardship plan approved by the Ministry of Environment on March 1, 2010 covering residential fluorescent lamps, and subsequently amended and approved by the Ministry on April 23, 2012 to include all lamps used in residential and non-residential applications, as well as lighting equipment. More information on LightRecycle is available for Producers at www.productcare.org and for consumers at http://www.lightrecycle.ca.

2 DUTY OF PRODUCER

Section 2.1 of the Regulation provides:

> *Except as otherwise specifically provided in this regulation, a producer must*
>
> > *(a) have an approved plan under Part 2 [Product Stewardship Plans] and comply with the approved plan, or*
> >
> > *(b) comply with Part 3 [Product Stewardship Program Requirements If No Product Stewardship Plan]*
>
> *with respect to a product in order to sell, offer for sale, distribute or use in a commercial enterprise the product in British Columbia.*

The Regulation defines "Producer" as:

> *(b) in respect of the producer of a product within a product category other than the beverage container product category or the tire product category,*
> > *(i) a person who manufactures the product and sells, offers for sale, distributes or uses in a commercial enterprise the product in British Columbia under the manufacturer's own brand,*
> > *(ii) if subparagraph (i) does not apply, a person who is not the manufacturer of the product but is the owner or licensee of a trademark under which a product is sold, distributed or used in a commercial enterprise in British Columbia, whether or not the trademark is registered, or*
> > *(iii) if subparagraphs (i) and (ii) do not apply, a person who imports the product into British Columbia for sale, distribution or use in a commercial enterprise;*

[1] British Columbia Ministry of Environment, BC *Recycling Regulation,* BC Reg. 449/2004, as amended B.C. Reg. 88/2014, May 23, 2014. Accessed at http://www.bclaws.ca/civix/document/id/complete/statreg/449_2004.

The Recycling Regulation Guide notes that the Producer is typically the product manufacturer, distributor or brand-owner, but can also be an importer, broker, or retailer who sells the product directly to a consumer or imports and uses the product in a commercial enterprise in the province, including catalogue or internet transactions.[2]

3 APPOINTMENT OF STEWARDSHIP AGENCY

LightRecycle is developed, managed and operated by PCA, a not-for-profit industry association that manages product stewardship program for household hazardous and special waste on behalf of its members across Canada. PCA was established as an agency to allow its members (i.e., Producers of program products) to meet their obligations under the requirements of applicable extended producer responsibility legislation. PCA is incorporated under the Canada Not-for- Profit Corporations Act[3] and is governed by a board of directors with representation from four membership classes (Paint Products, Lighting and Alarms Products, Retail, Other Products). A current list of PCA's Board of Directors is available on PCA's website.

In addition, PCA has established a LightRecycle industry advisory committee, whose purpose is to provide advice, information and recommendations to PCA on matters pertaining to the operation of LightRecycle.

According to section 5(c)(i) of the Regulation, all Producers of lamps and lighting equipment are obligated to collect and pay the costs associated with the collection and management of lamps and lighting equipment sold, offered for sale or distributed in BC. To meet this obligation, each Producer appoints PCA as its agent to carry out the duties imposed by the Regulation. Membership information is available on PCA's website, productcare.org

PCA members represent the vast majority of the lamp and lighting equipment market in British Columbia for obligated products. Program members may include the manufacturers, brand owners, distributors, first importers and retailers of obligated products in BC. Program membership is open to all obligated Producers. A current list of program members is available on PCA's website, productcare.org.

PCA also manages and operates stewardship programs for various categories of lighting products in Manitoba, Quebec and Prince Edward Island.

4 PRODUCTS COVERED UNDER THE STEWARDSHIP PLAN

Schedule 3, of the Regulation, the Electronic and Electrical Products Category, includes Section 2.1 (e) "all electronic or electrical lighting equipment, parts and bulbs." Pursuant to these requirements, the Program includes all lamps used in residential and non-residential applications, as well as lighting equipment, as defined in this section ("Program Products"). Product categories and Program Products are detailed on PCA's website and in the Program's Product Guide (available on the LightRecycle website, lightrecycle.ca), and subject to change by PCA.

[2] British Columbia Ministry of Environment, BC *Recycling Regulation Guide,* April 2012.

[3] A copy of the legislation is available at http://laws.justice.gc.ca/eng/acts/c-7.75/. PCA's Letter of Continuance, bylaws and current financials are available on PCA's website.

Program Products are marketed and sold through various channels to both residential and commercial end users.

The following sets out the definitions of the various categories of products included in the Program.

Lamps
PCA defines "lamp" to mean a light source or replaceable component, designed to produce light from electricity. Lamps are commonly referred to as "bulbs" or simply as "lights" by the public. Previously, PCA grouped different types of lamps into various categories, according to their properties. Going forward, PCA proposes a simplified categorization. To better reflect the market transition from fluorescent lamps to LEDs, product categories for lamps have been consolidated as follows for reporting purposes:

1. **Fluorescent (Mercury-Containing) Lamps:** All compact fluorescent lamps (CFLs), fluorescent tubes and high intensity discharge (HID) lamps.
2. **Light Emitting Diode (LED) Lamps:** Solid-state lamps used for specialty purposes and conventional lighting applications.
3. **Traditional Lamps:** All incandescent/halogen filament lamps of all shapes, sizes and wattages, and mini bulbs.

Broken lamps are accepted by the Program, subject to them being packaged in accordance with the requirements of the Program.

Lighting Equipment
PCA defines "lighting equipment" to include fixtures and ballasts used with electrical or electronic lighting products. For the purposes of this plan, light fixtures included in the program are defined as electrical devices with the primary purpose of housing an electrical lamp that is an accepted Program Product. Typically, the purpose of the light fixture is to hold the lamp, to provide electricity to the lamp and to direct the light which is produced. Light fixtures can be affixed to a building or may be free standing or portable. Ballasts are devices used to stabilize the current in an electrical circuit in a lamp. They are commonly integrated into a lamp and/or a light fixture and, in many cases, are designed to be removed and replaced during the lifespan of the lamp or the light fixture.

"Light Containing" Products
Products containing lamps with a primary purpose that is not to illuminate or assist in the illumination of space are outside the scope of the program, including, but not limited to:

- Products covered by other schedules of the Regulation and for management in other product stewardship programs in BC. Examples include large appliances, small appliances, medical equipment and electronic products.

- Products containing lights with a primary purpose of signalling or displaying information. Examples include traffic signals, railway crossing signals, neon signs, backlit signs and electronic billboards.

Note that replacement lamps used in excluded products which are sold and can be disposed of separately are included in the program.

Aeronautical, Marine and Auto Fixtures
Fixtures designed to be integrated into a mode of transportation are excluded from the program if the primary purpose is navigation, navigational safety, signaling or displaying information. These are defined as light-sources that are integrated into a protective lens and/or housing and designed to function as stand-alone or replacement lighting products to permit the transportation device to safely navigate to its destination. Fixtures exclusively designed to illuminate space within one or more types of transportation are also excluded from the program. For example, fixtures designed to light the interior of an automobile or automobile trunk are excluded.

Orphan Products
Program Products include orphan products. Orphaned products are defined as those that are no longer in production or which the manufacturer is no longer producing, provided that their function was the same as Program Products.

Batteries
Batteries are not considered part of the Program and not many Program Products are sold with batteries. Where products contain primary or rechargeable batteries designed to be removed/replaced, consumers are encouraged to remove them from the product in accordance with the manufacturer's instructions and recycle them through an approved stewardship program for batteries. The Program manages all batteries embedded in Program Products that are returned through the Program, including batteries that are designed to be not removed by the user.

5 STAKEHOLDER CONSULTATION

As a prerequisite to developing and finalizing this Program Plan, PCA conducted stakeholder consultations in order to provide meaningful opportunities for consultation and comment from those affected by the program. The key aspects of the consultation included:

- Conducting an in-person consultation on October 19, 2016 at the Bear Mountain Resort in Victoria, British Columbia, focusing on the Program Plan's proposed targets and commitments.
- Posting the draft program plan on PCA's website for public review.
- Conducting separate webinars for all interested parties on March 15 and March 29, 2017.
- Conducting a webinar with representatives of the BC Product Stewardship Council, representing local governments in BC, on March 14, 2017.
- Notice for all consultations was emailed in advance of each session to all interested stakeholders including, but not limited to, industry members, industry associations, collection sites and regional and local governments. Notice of consultations was also posted on PCA's website and distributed through the appropriate industry associations and non-profit organizations, including the Recycling Council of BC and Coast Waste Management Association.

Comments received from the consultations were documented and amendments made to the Program Plan where appropriate. A summary of comments received and PCA's responses are provided in Appendix A.

The Program has a number of means of obtaining ongoing stakeholder input into the operation of the Program:

- Regular advisory committee meetings
- Member updates
- Collection site visits by the Program
- Feedback from the consumer public during public outreach events
- Feedback received by email and phone from all affected stakeholders

6 COLLECTION SYSTEM AND CONSUMER ACCESSIBILITY

In accordance with section 5(1)(c)(iii) of the Regulation, the Program employs a comprehensive network of permanent year-round collection sites providing consumers with reasonable access to locations where they can drop off Program Products for recycling at end of life at no cost to the consumer.

In accordance with section 5(1)(c)(i) of the Regulation, Program members pay the costs of collecting and managing Program Products covered by the stewardship plan, whether the products are currently or previously sold, offered for sale or distributed in BC.

The Program does not directly own or manage collection sites, but rather contracts with organizations that provide collection services. The collection system is comprised of:

- Return-to-Retail Sites
- Non-Retailer Sites (sites that are not retail but are available for public drop-off, like bottle depots)
- Municipal Sites (local government recycling centres and transfer stations)
- Regional district sites (similar to municipal sites but regional government)
- Scrap Metal Facilities
- Not-for-Profit Organizations
- First Nations Sites

As of December 31, 2016, there were a total of 429 permanent collection sites in the program.

The Program seeks to collaborate with other stewardship programs wherever possible to enhance program performance, including finding operational efficiencies and consistencies in program delivery. Current examples include the collection of residential light fixtures in CESA collection bags and the management of embedded batteries found in Program Products.

The reporting metrics set out in this section align with the third party assurance requirements for non-financial information, including program-specific definitions and applicable criteria.

6.1 Collection Site Types

Different collection systems are needed depending on the type of product (lamps and fixtures), the type of use (residential or business) and the quantities involved. Accordingly, the Program's collection system offers a variety of collection models servicing different sectors and accepting different product categories to optimize consumer convenience. All collection sites are identified on the Program's depot locator on the website, along with the types of program products accepted, contact information and

hours of operation. In addition to the Program's depot finder, the Program may also utilize services such as RCBC's Recyclepedia and consumer hotline.

Residential Volume Drop-Off Collection System
The Program employs a system of permanent year-round collection locations for the collection of residential quantities of lamps and fixtures in order to provide reasonable accessibility to consumers. Many residential use collection sites, especially return to retail locations, have limited storage space. Consequently, quantity limits may apply.

Commercial Volume Drop-Off Collection System
The Program offers locations for commercial generators of Program Products to recycle larger quantities of Program Products. The Program works with collection sites to develop limits on the quantity of Program Products appropriate for each drop-off location. Commercial collection sites generally collect all types of Program Products, including lamps and fixtures, but in some instances it may not be appropriate for a location to receive all fixtures, in which case they go directly to the market-based collection system for scrap metal.

Large Volume Generator Service Collection System
In addition to collection sites, the Program provides direct pick-up services for large volume generators (LVGs). LVGs are organizations/companies that generate large enough quantities of Program Products at their own site or at offsite locations that would over-burden any one collection site. The Program provides this service free of charge for specified minimum quantities.

Collection Events
The Program may periodically conduct collection events to augment the collection system and enhance collection services as needed. Wherever possible and feasible, the Program collaborates with other stewardship programs and local governments on such initiatives.

Performance Metrics
The Program's annual reports include the location and number of collection sites for residential-use lamps and fixtures, commercial lamps fixtures, compared with the same metrics for the previous year. Additionally, the Program reports annually on the number of collection sites by regional district as well as the annual number and location of collection events.

Collection System Metric	Performance Measure
Number of collection sites	Report annually by type, provide list of sites with locations, and identify changes from previous year.
Number of collection sites by regional district	Report annually
Number of collection events	Report annually and provide list of events with locations.

6.2 Accessibility

The Program measures consumer access to collection facilities in accordance with the SABC Accessibility Standard which defines reasonable access as a 30 minute drive to a collection site in urban areas of

population greater than 4,000, and a 45 minute drive to a collection site in rural areas with a population greater than 4,000. Since the Program's launch in 2010, the Program has established a comprehensive network of 445 collection sites with a 95% accessibility rate. The collection system has been stable over the past years and continues to seek opportunities to expand the network of collection sites. The Program also continues to work with underserviced communities to support appropriate collection service where feasible.

Accessibility Performance Metrics
The Program strives to maintain the minimum accessibility rate of 95% for both residential lamps and residential fixtures based on the SABC Accessibility Standard. As of December 31, 2016, the Program had an accessibility rate of 99.7% for residential-use lamps and 98.1% for residential-use fixtures.

Accessibility Metric	Performance Measure
Residential-use lamps	Minimum of 95% accessibility rate based on SABC Accessibility Standard
Residential-use fixtures	Minimum of 95% accessibility rate based on SABC Accessibility Standard

6.3 Absolute Collection Quantity

Absolute collection quantity is the quantity of units and/or weight of Program Products collected annually by the Program across BC. Due to the value of the metals found in lighting fixtures, some commercial generators direct fixtures to the private scrap metal system, which is outside the scope of the Program's collection system.

While collection volumes for all product categories have increased year over year, a number of factors make it difficult to set collection targets at this time:

- The shift in sales by lamp technology from CFLs to LEDs is occurring at a faster rate than originally anticipated.
- The return rate of CFLs is not predictable.
- The life expectancy of first generation LED products is uncertain.

Consequently, the Program will report out on the number of units of lamps collected by product category and weight of fixtures collected, as well as the actions to be taken to increase collections, but will not continue with the sampling at scrap metal facilities and will not set collection targets.

Collection Performance Metrics
The Program will report annually on:

- Quantity (units) sold annually by category.
- Quantity (units) of lamps collected by category.
- Quantity (units) of lamps collected by regional district and for the province
- Weight of residential fixtures and ballasts collected, in kilograms and/or tonnes.

Category	Performance Measure
All product categories	Units Sold
All lamp categories	Units Collected by Category[4] Units Collected by Regional District
Residential Fixtures	Kgs Collected
PCB-Containing Ballasts	Units Collected

6.4 Capture Rate

A "capture rate" compares the quantity of products collected in a year to the quantity of products estimated to be "available for collection" in that year.

In contrast, a "recovery rate" compares the quantity of products collected in a year to the quantity of products actually sold into the market in that year.

A capture rate model is generally considered more appropriate than a recovery rate model for lamps due to time period between the sale of a unit and the end of life of that unit. Unlike consumable products, each unit sold should eventually be available for collection. However, the increasing lifespans of these products and changing sales patterns of various lamp categories reduce the validity of the capture rate. Capture rates reported in previous years have exceeded 100%, evidencing the difficulty in calculating the amount of product available to collect. The rate of transition from CFLs to LEDs has exceeded expectations. LED lighting retrofits result in CFLs being removed prior to end-of-life. In addition, the lifespan of first generation LEDs contributes to the uncertainty in estimating the amount of program product available to collect. Consequently, the Program does not view capture rate as an applicable or reliable metric.

6.5 Waste Composition Audits

To confirm that Program Product is being successfully diverted from landfill, the Program participates in waste composition audits of municipal landfills undertaken by local governments in partnership with other stewardship organizations. Each audit surveys a sample of waste from the landfill and tracks evidence of major program product categories.

Performance Metrics
The Program will report out annually on the number of waste composition audits conducted and the regional districts where they took place, as well as the amount of Program Product identified.

Waste Metric	Performance Measure

[4] In accordance with new lamp categories detailed under section 4 of the Program Plan.

Number and location of waste audits conducted	Report annually
Units of program product identified during waste audits	Report annually

6.6 End-of-Life and Export Pathways

The end-of-life and export pathways for commodities derived from the processing of Program Products is detailed under section 9 of the Program Plan.

For some Program Products, particularly those with high metal content, alternative pathways exist for their collection and processing. The Program employs a number of approaches to confirm Program Products not collected through Program channels are being managed responsibly through alternative pathways. These include:

- Waste composition studies (see section 6.5 above)
- Ongoing consultation with processors that receive the products
- Ongoing consultation with commercial lighting contractors

7 CONSUMER AWARENESS

The Regulation requires that a stewardship program plan make adequate provision for informing consumers of the Program, the location of collection facilities, how to manage Products in a safe manner as well as the environmental and economic benefits of participating in the Program.

It is important that consumers are aware of the importance of recycling Program Products, how to handle them, and where to return them. Accordingly, the Program provides specific information on:

- The categories of Products in the Program
- Return options and handling procedures
- Applicable fees and how they are used

To maximize effectiveness and minimize consumer confusion, where possible the Program works with the other stewardship programs to provide coordinated program information and access to consumers. For example, the Program cooperates in the creation of a joint product guide with other stewardship programs through the Stewardship Agencies of BC and provides a single point of consumer information through the Recycling Council of BC hotline and Recyclepedia website and smartphone app.

Communication Methods:
LightRecycle engages in extensive communication efforts to inform British Columbians about the Program. The following is a of the Program's public education materials and strategies:

- **Website** - The program website will have information on what items can be returned and how to return them. A Google Map-based depot finder is available. The Program website and depot

finder provide applicable information based on the type of product, sector and/or quantity of products to be returned. Also included is a print-ready brochure and system for reordering consumer information materials produced by the Program. The Program's official website, www.lightrecycle.ca underwent a complete overhaul in 2015 in order to vastly improve the user experience.

- **Recycling Hotline** 1 800 667 4321 or 604 RECYCLE– The program will participate in the Recycling Council of British Columbia (RCBC) recycling hotline service. Consumers can contact RCBC operators during business hours and obtain information about return options for program products.
- **RCBC Recyclepedia** – The program will provide RCBC with updated lists of collection sites for inclusion in their online search system and smartphone app, which informs consumers of their return options.
- **Point of Sale –** PCA offers retailers the ability to order a variety of PoS materials (including, but not limited to: rack cards, posters, brochures) upon request, free of charge, via an easy re-order form on the program website. The Program engages with retailers on an ongoing basis to identify additional ways of engaging consumers at point of sale and increase the utilization of the PoS materials in an effort to improve program awareness. Along with providing informational material to stores, retailers may also direct their customers to the website to find information such as accepted products, Environmental Handling Fees, collection networks and FAQs, which are all easily accessible.
- **Point of Return** – Any participating collection depots will be offered program signage to display and counter cards to distribute to consumers.
- **Earned media and advertising –** The Program's public education materials and strategies consist of, targeting the use of earned media (such as press releases) and paid advertising. The Program partnering with mainstream media outlets for TV, radio, and print advertising campaigns to create awareness and highlight the ease and convenience of the Program.
- **Direct Mailings and Communications –** The Program directly targets large commercial generators of Program Products through dedicated mailings and partnerships with relevant associations and organizations.
- **Events –** LightRecycle will continue to participate in community events with event collateral, such as a branded tent, tablecloth, pop-up banners and other ways to ensure the Program has a strong visual presence at these events.
- **Other** – Other methods of communications may be identified by the program and explored for potential effectiveness.

Performance Measures

Stewardship programs typically experience a strong increase in consumer awareness following the program's launch, which tapers off as the program matures, requiring additional resources to achieve additional increments. Accordingly, the Program anticipates an average 1.5% annual increase from the 2015 baseline of 49% until 2021, at which time the program will reassess the target.

In addition, the Program will report out on website hits and consumer enquiries on an annual basis.

Consumer Awareness Metric	Performance Measure
Percent of population aware of the program	Average 1.5% annual increase from 2015 baseline (49%)

Consumer awareness survey	Conduct every two (2) years from 2017
Program website visits	Report annually
RCBC Recyclepedia website visits and hotline calls	Report annually
Program's educational materials and strategies	Report annually

8 MANAGEMENT OF PROGRAM COSTS

8.1 Program Revenue

The Program is funded by Environmental Handling Fees ("EHFs") paid by Program members on the sale of new Program Products in British Columbia. As revenues are driven by member sales, the Program has no direct control over them. The EHF is not a tax or a refundable deposit. It may be passed on by the members to their customers, either as a visible fee or by incorporating the cost directly into the price of the product. Fees are set by PCA based on budgeting of fee revenue and Program expenses. Fees are adjusted by PCA from time to time to address surpluses or deficits. The Program revenues are applied to the operational expenses of the Program including:

- Administration:
- Communication and education;
- Collection, transportation, recycling and disposal of Program Products; and
- Maintaining an appropriate reserve fund.

8.2 Reserve Fund

As part of its risk management system, the Program maintains an appropriate reserve fund in accordance with PCA's reserve fund policy. The reserve fund serves to stabilize program finances in the event of unexpected increases in collection volumes, fluctuations in operating costs or reduced revenue due to economic or other factors. PCA monitors the Program's financial performance on an ongoing basis to ensure it remains financially sustainable and that an adequate reserve fund is maintained.

8.3 Audited Financial Statements

To ensure transparency and accountability, the Program's financial statements are audited annually by an independent third party auditor and published on its website pursuant to section 8.2(f) of the Regulation. The audit confirms all deposits received and refunds paid by members, as well as revenues and expenditures for any fees associated with the approved plan that are charged separately and identified on the consumer receipt of sale.

8.4 Producer Compliance

In order to maintain a 'level playing field' for Program members and to ensure compliance with the Regulation, the Program actively searches for, identifies and recruits Producers of Program Products. If an obligated Producer does not join the Program despite notification of their regulatory obligation, the Program refers the matter to the BC Ministry of Environment for compliance and potential enforcement proceedings.

9 MANAGEMENT OF ENVIRONMENTAL IMPACTS

9.1 Pollution Prevention Hierarchy

In accordance with Section 13 of the Regulation, PCA works with its service providers to ensure Program Products are managed, where feasible, in accordance with the Pollution Prevention Hierarchy (PPH). This section details the management options and considerations for Program Products.

Reduce and Redesign
Lamp technologies are evolving rapidly and the lamp industry has made significant advances in addressing the environmental impacts of lighting equipment through a reduction in toxic components and quantity of materials utilized in products, as well as increased energy efficiency and product lifespans.

There have also been numerous advances in CFL technology. The amount of mercury in CFLs has been reduced, fluorescent tubes are now available in a longer life version that provides 30,000 hours of light compared to the 24,000 hours for other lamps, and fluorescent tubes with a smaller diameter are now available (T8 or T5), providing the same or more light with about 50% less material resources by weight.

The most significant development is the shift from fluorescent lighting technology to light emitting diode (LED) technologies. LEDs do not contain mercury, a necessary part of fluorescent lamp technology. LEDs also have significantly longer lifespans and are more energy efficient. Sales data indicates that this technology shift is occurring at a faster rate than anticipated.

Efforts to reduce the environmental impact of fixtures are also ongoing. Polychlorinated biphenyl (PCB) ballasts have not been sold in Canada for decades. The use of lead-based paint has also declined significantly in modern fixtures. Fixture manufacturers are continuously improving the energy efficiency of their products and reducing the materials required and weight of products, where possible and applicable.

Lamp and fixture manufacturers regularly review the design of these products for functionality, sustainability and impact on the environment.

Reuse and Repair
The Program is designed for lighting equipment that no longer works and cannot be safely reused. Expired lamps are not reusable. Options for managing reusable products outside of the program include the BC Industrial Materials Exchange (BCIMEX) and reuse through a variety of channels, such as Habitat for Humanity and thrift stores.

Recycle and Recover
The objective of the Program is to minimize the improper disposal of Program Products by providing an effective collection and ensuring that the collected materials are either recycled or disposed of in an environmentally responsible manner. The Program strives to manage collected materials using the highest option on the Pollution Prevention Hierarchy as set out under subsections 5(3)(d-g) of the Regulation, where economically feasible and viable. The application of the Pollution Prevention Hierarchy and the management of each product varies by Program Product depending on options available and economic feasibility.

9.2 Management of Program Products

Fluorescent Lamps
The Program maintains an established system for managing fluorescent lamps. After collection, lamp products are transported to the Program's primary processors. At the processors, lamp products are broken down into their respective component materials and either processed on site or sent to a downstream processor for further processing as follows:

- Metal is sent to various downstream metal recyclers for recovery.
- Glass is sent to various concrete manufacturing companies for use in concrete manufacturing or as an aggregate, or manufactured in to sandblast media.
- Mercury phosphor powder is sent to a retort facility where it goes through a retort process to separate the mercury from the phosphor powder. The mercury is sold back into the market as a commodity for manufacturing; or disposed of in an environmentally responsible manner due to the continued decrease in demand for products with mercury. The phosphor powder is reused where economically feasible and if not, then disposed of in an environmentally responsible manner.

Lamp processors are required to conform to the BC LightRecycle Lamp Processor Standard, which defines the minimum requirements to become an approved processor. The Standard sets out environmental, occupational health and safety, and material handling rules to ensure materials are handled appropriately.

Residential Fixtures
Residential fixtures contain materials similar to small appliances (e.g., metal, glass, plastics, etc.). As a result, the Program has partnered with the Canadian Electrical Stewardship Association (CESA) stewardship program to collect residential fixtures together with small appliances and power tools at contracted collection sites that serve as CESA depots. They are shipped to processors where they were comingled with other electronics and broken down into their respective components.

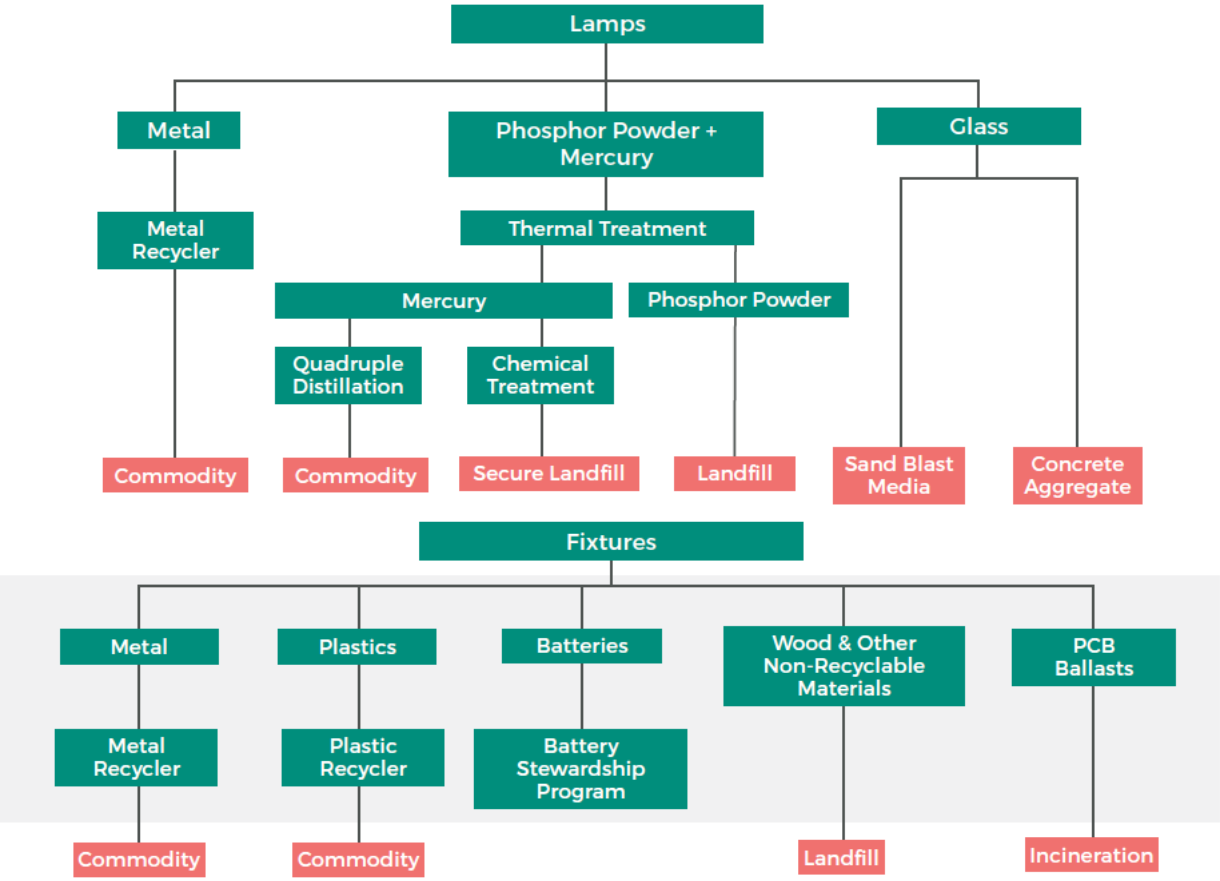
Materials received by the processors are sampled to estimate the proportion of residential fixtures v. CESA products. This coefficient is used to then calculate the estimated weight of residential fixtures collected.

Commercial Fixtures and Non-PCB Ballasts
Commercial fixtures and non-PCB ballasts are collected and managed outside the Program through the existing market-driven scrap metal recycling system, provided that some non-metal material is not recycled. Since it is a market driven system, the Program has no ability to verify or report on the volume and portion of the material recycled and or disposed of through this system.

PCB Ballasts

PCBs are regulated under both Provincial and Federal jurisdictions. PCB ballasts are collected and managed as hazardous waste and incinerated at high temperature at a licensed incinerator.

Figure 1: Material Processing Pathways and End Disposition



This table provides an overview of the processing pathways and final disposition of materials derived from Program Products.

Compositions of Compact Fluorescent Lamps and Fluorescent Tubes[5]

Material	Composition of a CFL	Composition of Fluorescent Tube
Glass	75-90%	75-95%
Mercury	<0.015%	<0.01-<0.05%
Lead Oxide	0.2-2%	0.2-2%
Aluminum Oxide	0-2%	0-2%
Phosphor Powder	0.5-3%	0.5-3%
Miscellaneous Compounds (fluoride, manganese dust, tin dust etc.)	0-0.1%	0-0.1% per compound

This table shows the relative amounts of the materials in CFLs and fluorescent tubes. Given the rapidly evolving design of LED technologies, a breakdown of material composition for LED products cannot be provided at this time.

The Program works with processors that maintain certification based on internationally-recognized standards and manage materials in accordance with all federal and provincial regulatory requirements. Processors' processes are audited to ensure compliance. The final use (end fate) of materials is considered when selecting processors. Through surveying processors, PCA endeavours to follow the chain of custody through to the end fate of the product. However, PCA's ability to do so is limited by the processor's willingness and ability to provide such information. PCA provides available information with regard to end fate in the Program's annual report. Availability of options to move materials up the hierarchy are regularly monitored.

Performance Measures

The Program will report annually on:

- End fate pathway of commodities derived from Program Products as available.

Metric	Performance Measure
End fate pathway of commodities	Report annually

10 DISPUTE RESOLUTION

The Program contracts with all suppliers and service providers by way of commercial agreements. Any disputes are resolved through normal commercial dispute resolution practices set out in the terms of each contract, including negotiation, mediation, arbitration and legal proceedings, if required. Performance Measurement Summary and Reporting Commitments.

[5] Kelleher, M. (2007). *Fluorescent Lighting in Ontario –Lifespan Model and Research Report to Waste Diversion Ontario*.

11 PERFORMANCE MONITORING AND REPORTING COMMITMENTS

Metric		Performance Measure
Collection System and Accessibility:		
Number of collection sites		Report annually by type, provide list of sites with locations, and identify changes from previous year.
Number of collection sites by regional district		Report annually
Number of collection events		Report annually and provide list of events with locations.
Percent of population with access to a collection site	Residential-use lamps	Maintain a minimum of 95% accessibility rate based on SABC Accessibility Standard
	Residential-use fixtures	Maintain a minimum of 95% accessibility rate based on SABC Accessibility Standard
Waste Audits		
Number and location of waste audits conducted		Report annually
Units of program product identified during waste audits		Report annually
Collections		
All product categories		Report units sold
All lamp categories		Report units collected per category (using new categories) Reporting units collected by regional district
Fixtures (Residential & Commercial combined)		Report volumes collected
PCB Containing Ballasts		Report volumes collected
Consumer Awareness:		
Percent of population aware of the program		Average 1.5% annual increase from 2015 baseline (49%)
Consumer awareness survey		Conduct every two (2) years
Program website visits		Report annually
RCBC Recyclepedia website visits and Hotline calls		Report annually
Program's educational materials and strategies		Report annually
Management of Environmental Impacts		
End fate pathway of commodities		Report annually

12 APPENDIX: STAKEHOLDER CONSULTATIONS

[Information here will be completed following consultations.] Feedback received at the consultation events and via email is summarized in the table below. The left-hand column outlines the specific question or comment and the right-hand column contains the response. The number in brackets refers to the number of times the issue was raised.

Issue Raised	Response