



LightRecycle Washington 2023 Annual Report

For submission to:

Washington State Department of Ecology
Solid Waste Management Program
Attn: Megan Warfield

Submitted by:

Brian Bastien, President
PCA Product Stewardship Inc.
P.O. Box 30811
Seattle, WA 98103

Submitted May 2024

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1 Executive Summary

The Washington State Mercury-Containing Lights Product Stewardship Program, called LightRecycle Washington (the “Program” or “LRW”), began on January 1, 2015, for the collection and recycling of mercury-containing lights sold at retail.

Pursuant to WAC 173-910-430, each stewardship organization must submit an annual report to the department describing the results of implementing the stewardship organization's plan for the prior calendar year. In addition, WAC 173-910-430(2) states that starting in 2023, the Program is required to provide an analysis that includes:

1. The percent of total sales of lights sold at retail to covered entities in Washington that mercury-containing lights constitute,
2. The estimated number of mercury-containing lights in use by covered entities in the state,
3. The projected number of unwanted mercury-containing lights to be recycled in future years.

The results of this analysis are presented in [Appendix F](#).

Washington State residents and businesses can recycle up to 10 mercury-containing lights per day for free, by dropping them off at authorized collection sites throughout the State. Collection sites are required in every county and every city of 10,000 or more people. LRW continues to meet this requirement through its established collection network of over 180 registered sites, and by holding collection events in areas where no permanent collection site exists. Collectors include retailers, municipal waste facilities, and residential curbside collection.

Collected lights are transported to the Program processor (recycler) using ground transport, where they are recycled as Universal Waste. Recovered mercury is retorted, then reused or stored, and is managed by the processor in compliance with applicable local, state, and federal laws. Recycling mercury-containing lights protects the environment and human health by reducing the release of mercury into the environment and by recovering recyclables, such as metals and glass.

The total amount of program mercury-containing lamps collected in 2023 was 445,985 lbs., estimated to be 898,282 units. This volume represents approximately 70.3% of the annual collection target of 1,278,444 units, as committed to in the Program Plan Update submitted on December 23, 2021 and approved by the Department of Ecology on January 10, 2022.

The program did not achieve its annual collection goal due to several contributing factors. Primarily, the decline in units sold exceeded our projections, driven by a faster-than-anticipated decrease in mercury-containing light sales. This swift market transition, combined with the program's maturity, led to reduced collection volumes, making it increasingly challenging to meet our established targets. In light of these shifts in market dynamics and consumer behavior, we are actively reevaluating our strategies year by year. It is evident that, despite our best efforts, collection numbers will continue to decline at a faster rate than initially forecasted when these targets were set. Our commitment remains steadfast in ensuring the safe and responsible collection and disposal of mercury-containing lamps, and we are fully dedicated to making necessary adjustments to align our goals with the evolving lighting industry landscape.

The Program is funded through an Environmental Handling Charge (EHC) added to the purchase price of each mercury-containing light sold at retail in or into Washington State. The current EHC is \$0.95 per unit for all program types. The Program is administered by PCA Product Stewardship Inc. (PCA), a 501(c)(3) non-profit organization.

2 Program Description

The Program has been developed pursuant to the provisions of Chapter 70A.505 of the Revised Code of Washington ([Chapter 70A.505 RCW](#)) "Mercury-containing lights-proper disposal" (the "Law"). This Plan complies with the requirements of the "Rule" prescribed in (Chapter 173-910 Washington Administrative Code ([Chapter 173-910 WAC](#)) where there is no conflict with the requirements of Chapter 70.275 RCW.

The Law requires that the Program be funded through an EHC added to the purchase price of each mercury-containing light sold at retail in or into Washington State as of the program start date, January 1, 2015. The EHC was \$0.25 per unit for all program product types from the start of the program until June 30, 2017. On July 1, 2017, the EHC was increased to \$0.50 per unit for all program product types. On February 1, 2018, the EHC was increased to \$0.95 per unit for all program types. Each change in EHC was approved by the Department of Ecology.

Every Producer of mercury-containing lights sold in or into Washington State for retail sale must participate in a product stewardship program for those products. Participation in LRW is open to all Producers.

A network of collection sites has been established throughout Washington State that includes retailers, municipal waste facilities, and collection events. Washington State residents and businesses can recycle up to 10 mercury-containing lights per day for free, by dropping them off at authorized collection sites throughout the State and at collection events.

Collected lights are transported to the Program processor (recycler) using ground transport, where they are recycled as Universal Waste. Recovered mercury is retorted, then reused or stored, and is managed by the processor in compliance with applicable local, state, and federal laws.

LRW is administered by PCA, a 501(c)(3) non-profit product stewardship organization incorporated in Oregon and registered in Washington.

3 Participating Producers

PCA Product Stewardship Inc. (PCA) has been designated as the Stewardship Organization for LRW. PCA administers the Program on behalf of all participating Producers who sell mercury-containing lamps in or into Washington State.

The participating Producers in LRW are listed in [Appendix A](#), along with their contact information and the associated brands they sell.

The total number of mercury-containing lights sold at retail in or into the state by participating Producers in 2023, as reported by Program Producers and remitting retailers, is provided in Table 1 below, by product category.

Table 1: Mercury-lights Sold at Retail in WA in 2023

Product Category	2023 Units Sold
Compact Fluorescent Lamps (CFL)	128,015
Fluorescent Tubes (All lengths and Shapes)	284,700
High-Intensity Discharge (HID)	11,944
Total	424,659

The total number of mercury-containing lights sold at retail in or into the state by participating Producers in 2023 was 424,659, representing a 31.6% decline from the 2022 sales figure of 621,230. This continuous decrease in sales is attributed mainly to the transition to other more efficient lighting technologies, such as Light Emitting Diodes (LEDs).

4 Program Goals

As outlined in the Program Plan Update dated December 23, 2021, the program used the average of the collected units from 2019 and 2020 (as reported in the 2019 and 2020 LightRecycle Washington Annual Reports respectively), as a baseline to establish collection targets. Table 2 below outlines the collection targets from 2021-2025.

Table 2: 2020-2025 Collection Targets

Targets	2019-2020 Averaged	2021	2022	2023	2024	Jan-Jun 2025 ¹
Units Collected	1,216,635	1,240,967	1,265,787	1,278,444	1,291,229	645,614
Annual Collection Increase		2%	2%	1%	1%	0%

The amount of materials collected at registered collection sites and received by the Program processor in 2023 was 449,679 lbs. This weight includes any non-program materials that may have entered the collection system.

Upon receipt at the processor, each shipment is weighed. Weights are recorded separately for fluorescent tubes and mixed lamps, which are comprised of CFLs, HID's and curved fluorescent tubes. Mixed lamps are sampled to determine the split of Program materials for those types. Weights of individual lamps were used to derive the number of units collected.

The total amount of program materials collected in 2023 was estimated at 445,985 lbs., which converts to 898,282 units, representing approximately 70.3% of the annual collection target of 1,278,444 units. A breakdown of the materials collected in 2023 is provided in Table 3 and the graphic below:

¹ The program's sunset date is July 1, 2026. Therefore, the collection target for 2025 was estimated to be half of the forecasted annual volume, as the program wind-down is expected to start in mid-2025.

Table 3: Program Materials Collected and Processed in 2023

Lamp Type	Weight Collected (lbs.)	Weight per Unit (lbs.) ²	Units Collected
Fluorescent Tubes - 4' Straight	291,418	0.5	582,837
Fluorescent Tubes - 8' Straight	96,116	1	96,116
Fluorescent Tubes - Curved Shapes	8,948	0.25	35,794
CFLs (Compact Fluorescent Lamps)	45,160	0.25	180,642
HIDs (High Intensity Discharge)	4,339	1.5	2,893
Total ³	445,985		898,282
2023 Annual Target			1,278,444
Percentage of Goal			70.3%

5 Collection System

Collection Sites

By law, collection sites are required in every county and every city of 10,000 or more people. LRW met this requirement by establishing a collection network of registered sites that collected all program products and held collection events in areas where no permanent collection site could be placed or advertising the location of near-by collection sites.

At the end of 2023, LRW had a total of 188 registered collection sites, including:

- 163 sites that accept all program products
- 21 sites that accept CFLs only
- 4 additional sites that are unadvertised, that accept all program products

Only collection sites that are advertised and accept all program products meet the collection site requirements in the law. See [Appendix C](#) for a complete list of advertised collection sites by city and county.

Unadvertised sites include:

- Sites that accumulate lights, but do not collect lights directly from residents or do not want to promote the collection of lights.

² Conversion rates used are outlined in the 2021 Program Plan Update, as approved by the Department of Ecology.

³ Total does not add up due to rounding.

- Curbside collectors whose facilities are not suitable for public drop-off of lights for recycling.

Mercury-containing lights were collected at events that were held around the state that were either initiated or supported by the Program:

- King County, North Bend
 - North Bend Recycling Event, April 29, 2023
- King County, traveling Wastemobile events
 - 21 locations, multiple days
- Wahkiakum County, Cathlamet
 - Cathlamet Building Materials, November 6-11, 2023
- Spokane County, Liberty Lake
 - Ace Hardware, September 7, 2023
- Spokane County, Airway Heights
 - Yoke's Fresh Market, September 11, 2023
- Cowlitz County, Longview
 - Northwest Alloys, Inc., November 13, 2023
- Kitsap County, Poulsbo
 - Poulsbo HHW Collection Event, June 24, 2023
- Snohomish County, Edmonds
 - The City of Edmonds, November 18, 2023
- Benton County, West Richland
 - City of West Richland, April 22, 2023
- Clean Earth Weekend Collection Events
 - Auburn, every weekend in 2023

Curbside Collectors

Two waste haulers that have curbside collection programs for mercury-containing lights are registered as LRW collectors. The names of the waste haulers and location of their corporate headquarters are:

- Recology/CleanScapes, Issaquah, WA
- Clean Earth, Kent, WA

6 Processor

Name and Contact Information

EcoLights Northwest, LLC (“EcoLights”)

Contact: Alex Domingo
 7021 South 220th Street,
 Kent, Washington 98032
 Phone: 206.388.5330

Total Mercury-containing Lights Processed

LRW collected 445,985 lbs. of program mercury-containing lights, all of which were processed by EcoLights.

Description of Processing Methods

Fluorescent Tubes: Fluorescent tubes are fed into a machine utilizing a controlled environment where the tubes are mechanically crushed and separated into the following components:

- Glass cullet
- Aluminum end caps
- Mercury phosphor powder

The glass cullet is sent to a Washington aggregate company for use in the manufacture of concrete. The aluminum endcaps are sold in Washington or Oregon as scrap metal, and the mercury phosphor powder is shipped to an EPA regulated and approved mercury retort company in Indiana, where the mercury is removed from the powder and made available for future use in new products or processes such as the manufacture of fluorescent lamps. The clean phosphor powder is shipped for recovery of rare earth elements contained in the powder.

CFLs: Compact Fluorescent Lamps are fed into a separate processing machine designed to separate the glass from the CFL base, and capture the mercury, in a controlled environment. The glass portion is then fed into a straight tube processing machine, where the glass is treated in the same way as fluorescent tubes. The bases are sent to a Washington or Oregon recycling company for scrap metal recovery.

HIDs: High-intensity discharge lamps are dismantled by hand or by machine. The outer glass envelope is removed, crushed, and sent with other lamp glass to an aggregate company for use in concrete. The metal frame is sent to metal recyclers, and the mercury-bearing glass ampules are fed back into the straight tube processing machine for further separation of the glass and mercury. The extracted mercury, along with any mercury-containing phosphor powder, is securely stored in airtight, 55-gallon drums. The securely contained mercury is transported to a certified recycling facility. EcoLights partners with Lighting Resources in Greenwood, IN, a facility permitted to handle and process hazardous materials, including mercury. At Lighting Resources, the mercury undergoes a retorting process. This process involves heating the mercury-containing material in a retort furnace, which vaporizes the mercury. The mercury vapor is then condensed back into its liquid form. This reclaimed mercury is of high purity and can be reused in various applications. The metal base and filament are sent to metal recyclers.

Other: Other types of lamps (U-tubes, circular, neon tubes, etc.) are processed in EcoLights straight tube recycling equipment, with components separated in the same manner into commodities to allow for further recycling.

Environmental Health and Safety

EcoLights maintains a certified RIOS:2016 Environmental Health and Safety Management System and employs a full time Environmental Manager and Health & Safety Manager.

EcoLights' processing equipment is equipped with pleated filters, HEPA filters, and sulfur-impregnated carbon beds to capture dust and mercury vapor before the process air is returned to the processing room. The lamp processing room also has additional ventilation equipment designed to capture fugitive mercury, which operates 24 hours per day. The building is not vented to the outside environment.

All technicians working in the lamp processing room are equipped with full face respirators designed to capture mercury and protect the employees. They also wear personal protective equipment, including coveralls, steel toed boots, gloves and hairnets to minimize exposure to any fugitive mercury in the processing room. All technicians undergo urine testing at hire to establish a baseline and every 6 months thereafter to ensure safe levels are maintained.

Transportation

Transportation is completed by these two methods:

1. Direct Dispatch – Collection sites contact EcoLights directly and pick-ups are scheduled to be completed by EcoLights or their parent company, Total Reclaim, or a third-party hauler.
2. FedEx – Box kits are sent out and returned via Fed-ex.

Compliance Audit Report

EcoLights Northwest provided PCA, in 2023, a Triennial Compliance Audit Report completed by a qualified third party, which satisfies the requirements of WAC 173-910-430 (9) (c) A. See [Appendix E](#).

EcoLights has not received any financial penalties, regulatory orders, or violations regarding the processing of lamps over the last three years.

7 Education and Outreach

Promotion and Outreach

The following are education and outreach activities undertaken by the Program in 2023:

- The program website (www.lightrecycle.org) attracted 32,928 sessions from 24,524 unique users, obtaining 24,241 visits to the recycling locator tool.
- 32% of website traffic came through referrals from other websites with 37.6% of all referrals coming from the Department of Ecology’s website.
- Collection sites and retailers were sent printed marketing materials on request.
- The following printed marketing materials were available:
 - Information cards (5” x 8”) were provided to retailers, local governments, and others upon request
 - Collection site posters were provided upon request
 - Printed marketing materials could be ordered by phone, email, or through the website and are provided at no charge

Digital Advertising

A Google Search campaign was conducted throughout the year, while a Facebook awareness campaign took place from September to December. Additionally, Facebook was used to promote collection events.

Format	Description	Duration	Impressions	Video Views	Clicks
Google Search	Text ads shown on Google & other search engines	Jan-Dec	8,130	-	2,052
Meta Ads – General Awareness	Animated video ads promoting the Program via Facebook and Instagram	Sep-Dec	309,168	196,568	2,965
Facebook Events Ads	Ads optimized to showcase events	Sep-Dec	42,470	-	593

Examples of marketing materials and advertisements used by the Program in 2023 are provided in [Appendix D](#).

Assessment of Effectiveness

Advertising was designed primarily to create awareness of the program, drive audiences to the website, and direct them to the collection site finder. However, the effectiveness of LRW outreach efforts cannot be gauged solely by the amount of website traffic or materials collected. Other factors such as the cumulative impact of advertising and

outreach efforts in previous years can impact collection volumes. The long lifespan of program products also means that program use does not necessarily immediately follow a gain in program awareness.

8 Financial Report

The Program is funded through an EHC added to the purchase price of each mercury-containing light sold at retail in or into Washington State. The EHC was \$0.25 per unit for all program product types from the start of the program until June 30, 2017. Due to declining sales volumes of mercury lights, particularly CFLs, the EHC was increased and approved by the Department of Ecology to \$0.50 per unit on July 2, 2017, and further increased to \$0.95 on February 1, 2018.

A breakdown of the revenue generated by the Program in 2023, as well as expenses for Program operations, communications, and administration is provided in Table 4.

Table 4 Program Financial Summary for 2023

Program Revenue	\$426,075
Retailer Offset	(\$4,669)
Total Revenue	\$421,406
Program Expenses	\$666,527
Other Expenses	
Communications	\$5,980
Administration	\$64,739
Regulatory	\$23,279
Total Other Expenses	\$93,997
Total Expenses	\$760,524
Change in Net Assets	\$(339,118)
Net Assets, beginning of year	\$1,629,312
Net Assets, end of year	\$1,290,194

Appendix A: Participating Producers and Brands

The following table lists the Producers who participated in LightRecycle Washington during 2023.

Table 5: List of Participating Producers in 2023

	Company Name and Website	Phone	Address
1	Ace Hardware Corporation www.acehardware.com	630-990-6600	2200 Kensington Court Oak Brook, IL 60523
2	Coleman Cable Inc. www.colemancable.com	800-323-9355	1530 Shields Drive Waukegan, IL 60085
3	Dolan Northwest LLC www.seattlelighting.com	503-972-5234	222 2nd Avenue Ext. South Seattle, WA 98134
4	Elong International USA Inc. (representing Do it Best Corp) www.elonginternational.com	972-247-7996	2425 Mclver Lane #150 Carrollton, TX 75006
5	Eye Lighting International of North America, Inc. www.eyelighting.com	440-350-7000	9150 Hendricks Rd. Mentor, OH 44060
6	Feit Electric Company, Inc. www.feit.com	562-463- 2852	4901 Gregg Rd. Pico Rivera, CA 90660
7	General Electric Lighting www.gelighting.com	216-266-9729	1975 Noble Rd East Cleveland, OH 44112
8	Good Earth Lighting Inc. www.goodearthlighting.com	800-291-8838	1400 East Business Center Drive, Ste. 108 Mount Prospect, IL 60056
9	Halco Lighting Tech (HLT) www.halcolighting.com	770-242-3906	2940 Pacific Dr. Norcross, GA 30071
10	Hawthorne Hydroponics LLC www.hawthorne-gardening.com www.sunlightsupply.com	360-883-8846	3204 NW 38 th Circle Vancouver, WA 98660
11	LEDVANCE Corp www.ledvance.com	978-570-3000	200 Ballardvale Street Wilmington, MA 01887
12	Orgill, Inc. www.orgill.com	901-754-8850	4100 S Houston Levee Rd. Collierville, TN 38017
13	OttLite Technologies, Inc www.ottlite.com	800-842-8848	220 W 7th Ave, Suite 100 Tampa FL 33602
14	Philips Lighting North America Corporation www.usa.philips.com	202-962-8567	200 Franklin Square Somerset, NJ 08873
15	Satco Products, Inc. www.satco.com	631-243-2022	110 Heartland Blvd. Brentwood, NY 11717

	Company Name and Website	Phone	Address
16	Sunshine Lighting Company www.sunshinelighting.com	718-768-7000	744 Clinton Street Brooklyn, NY 11231
17	Ushio America, Inc. www.ushio.com	714-236-8600	5440 Cerritos Avenue Cypress, CA 90630
18	Venture Lighting International, Inc. www.venturelighting.com	800-451-2606	32000 Aurora Road - Suite A Solon, Ohio 44139
19	Villa Lighting Supply, Inc. www.villalighting.com	314-531-2600	2929 Chouteau Ave. Saint Louis, MO 63103
20	Westinghouse Lighting Corporation www.westinghouselighting.com	215-671-2000	12401 McNulty Road Philadelphia, PA 19154

The following brands were sold by producers who participated in LightRecycle Washington during 2023:

- | | | | |
|----|---------------------|----|--------------------|
| 1 | ATR | 25 | Maxlite |
| 2 | Ace | 26 | Norman |
| 3 | Advance | 27 | Ottlite |
| 4 | AgroLED | 28 | ParPro |
| 5 | Bulbrite | 29 | Philips |
| 6 | CBC | 30 | Satco |
| 7 | Candela | 31 | Southwire |
| 8 | Cooper Lighting | 32 | Southwire Company |
| 9 | Eye Hortilux | 33 | Spectralux |
| 10 | Eye Lighting | 34 | Sun Blaster |
| 11 | Feit Electric | 35 | Sun Blaze |
| 12 | Fulham | 36 | Sun System Ballast |
| 13 | GE | 37 | Sunlite |
| 14 | GE Lighting | 38 | Sylvania |
| 15 | Galaxy | 39 | TCP |
| 16 | Gavita | 40 | Ultra Sun |
| 17 | Good Earth Lighting | 41 | Ushio |
| 18 | Green Creative | 42 | Venture Lighting |
| 19 | Halco | 43 | Westinghouse |
| 20 | Hygrade | 44 | Westpointe |
| 21 | Keystone | | |
| 22 | LEDVance LLC | | |
| 23 | LEDVance LTD | | |
| 24 | Luxx | | |

Appendix B: Collection and Processing Verification

The following letter from EcoLights confirms the amount of materials collected and processed by LightRecycle Washington during 2023.



7021 South 220th Street
Kent, WA 98032

T 206.343.7443
F 206.343.7445

ECOLIGHTS.COM

March 14, 2024

LightRecycle Washington Program
PCA Product Stewardship Inc.

RE: 2023 Processing Volume

Dear LightRecycle Washington:

This letter is to acknowledge that Ecolights Northwest, LLC picked up or received and recycled the following volume of used fluorescent lamps and other materials from collection sites under the LightRecycleWashington program during 2023:

- Total program material weight: 449,679 pounds

This volume includes some non-program materials, such as incandescent lamps in program containers. Additional back-up documentation of these volumes is available upon request.

Thank you again for the opportunity to work with you on this program. We look forward to continuing to provide comprehensive lamp recycling services to PCA Product Stewardship Inc. and the residents and small businesses of Washington during the coming year.

If you have any questions, please contact me at 206-343-7443.

Sincerely,

Bobby Farris

Bobby Farris
CEO
EcoLights Northwest, LLC

www.EcoLights.com

REDUCE > REUSE > RECYCLE

Appendix C: Registered Collection Sites

The following tables list the registered LightRecycle Washington collection sites who participated in the Program during 2023. Please note, unadvertised sites have not been listed, to maintain confidentiality for those sites who wish to remain unadvertised.

Table 6: Registered Collection Sites who accept all Program Products:

	Collection Site Name	Street	City	State	ZIP Code	County	Total Collected (lbs)
1	Bruce Transfer Station	504 South Lucy Road	Othello	WA	99344	Adams	0
2	Othello Ace Hardware	420 E Main Street	Othello	WA	99344	Adams	167
3	Ritzville Transfer Station	1803 East Danekas Road	Ritzville	WA	99169	Adams	0
4	Asotin County Regional Landfill	2901 6th Avenue	Clarkston	WA	99403	Asotin	835
5	Ace Hardware and Sporting Goods on Keene Road	103 Keene Road	Richland	WA	99352	Benton	1253
6	Batteries Plus Bulbs	321 North Columbia Center Blvd.	Kennewick	WA	99336	Benton	1014
7	Goodwill - West Richland	4034 W Van Giesen St. Suite B	West Richland	WA	99352	Benton	0
8	Grigg's Department Store Ace Hardware	1415 George Washington Way	Richland	WA	99354	Benton	2718
9	Kennewick Ace Hardware and Sporting Goods - Grigs	2831 W Kennewick Ave.	Kennewick	WA	99336	Benton	1945
10	Lake Chelan Lighting Center	917 E Woodin Ave	Chelan	WA	98816	Chelan	1632
11	Stan's Merry Mart	733 S. Wenatchee Ave.	Wenatchee	WA	98801	Chelan	3135

12	Around Again	22 Gilbert Rd.	Sequim	WA	98382	Clallam	2000
13	Swain's General Store	602 E 1st St	Port Angeles	WA	98362	Clallam	1342
14	Thurman Supply	1807 East Front Street	Port Angeles	WA	98362	Clallam	2820
15	Central Transfer and Recycling	11034 NE 117th Avenue	Vancouver	WA	98662	Clark	17628
16	Hi-School Ace Hardware	1605 W. Main Street	Battle Ground	WA	98604	Clark	1653
17	Hi-School Ace Hardware	13009 NE Hwy. 99	Vancouver	WA	98686	Clark	183
18	Mt. Pleasant Transfer Facility	1111 MT. Pleasant Rd.	Washougal	WA	98671	Clark	55
19	Washougal Transfer Station	4020 S Grant Street	Washougal	WA	98671	Clark	3558
20	West Van Materials Recovery Center	6601 NW Old Lower River Road	Vancouver	WA	98660	Clark	9011
21	Bredfield's True Value Hardware	102 Cowlitz St West	Castle Rock	WA	98611	Cowlitz	454
22	Woodland Ace Hardware	1325 Lewis River Rd	Woodland	WA	98674	Cowlitz	801
23	City of Bridgeport	1007 Fairview Ave.	Bridgeport	WA	98813	Douglas	31
24	Rock Island Community Recycling Center	23 S Garden Ave.	Rock Island	WA	98850	Douglas	205
25	Town of Waterville Community Recycling Center	720 N. Chelan Ave.	Waterville	WA	98858	Douglas	274
26	Ferry County Public Works - Solid Waste Div.	584 Torboy Dump Road	Republic	WA	99166	Ferry	0
27	Grigg's Department Store Ace Hardware	801 W Columbia St	Pasco	WA	99301	Franklin	1620
28	Garfield County Public Works	19th and Arlington	Pomeroy	WA	99347	Garfield	377
29	Marty's True Value Hardware	205 E First Street	Mattawa	WA	99349	Grant	148
30	LeMay's Central Transfer Station	4201 Olympic Highway	Aberdeen	WA	98520	Grays Harbor	4601

31	Bayview Solid Waste Dropbox and Recycle Park	5790 S. Kramer Road	Langley	WA	98260	Island	0
32	Camano Island Transfer Station	75 E. Camano Hill Road	Camano Island	WA	98282	Island	0
33	Camano Plaza Ace	370 NE Camano Drive Ste #1	Camano Island	WA	98282	Island	83
34	Coupeville Solid Waste Complex	20018 State Highway 20	Coupeville	WA	98239	Island	14135
35	North Whidbey Solid Waste Dropbox and Recycle Park	3151 Oak Harbor Road	Oak Harbor	WA	98277	Island	0
36	Oak Harbor Ace Hardware	150 SE Pioneer Way	Oak Harbor	WA	98277	Island	0
37	Jefferson County Disposal Site Quilcene	295312 Highway 101	Quilcene	WA	98376	Jefferson	2639
38	Jefferson County Household Hazardous Waste Collection Facility	282 10th St., Bldg 19	Port Townsend	WA	98368	Jefferson	2639
39	Jefferson County Recycle Center	325 County Landfill Road	Port Townsend	WA	98368	Jefferson	2639
40	Batteries Plus Bulbs	14917 NE 20th St.	Bellevue	WA	98007	King	2028
41	Batteries Plus Bulbs	536 NE Northgate Way	Seattle	WA	98125	King	10255
42	Batteries Plus Bulbs	17065 Southcenter Parkway	Tukwila	WA	98188	King	273
43	Bow Lake Recycling and Transfer Station	18800 Orillia Road S	Tukwila	WA	98188	King	8655
44	City of Covington	16720 SE 271st St.	Covington	WA	98042	King	99
45	City of Lake Forest Park	17425 Ballinger Way NE	Lake Forest Park	WA	98155	King	426
46	City of Sammamish	801 228th Ave SE	Sammamish	WA	98075	King	33
47	City of SeaTac	4800 South 188th St.	SeaTac	WA	98188	King	0
48	Crown Hill Tweedy and Popp Hardware	9000 Holman Rd. NW	Seattle	WA	98117	King	485

49	Enumclaw Recycling and Transfer Station	1650 Battersby Ave E	Enumclaw	WA	98022	King	4425
50	Factoria Household Hazardous Waste Drop Off Site	13800 SE 32nd St.	Bellevue	WA	98005	King	14734
51	Fairwood Ace Hardware	14100 SE Petrovitsky Road	Renton	WA	98058	King	1224
52	Hero Ace Hardware	1915 4th Ave	Seattle	WA	98101	King	724
53	Island Home Center & Lumber	17633 97th Pl SW	Vashon	WA	98070	King	152
54	Johnsons Home and Garden	26625 Maple Valley Black Diamond Rd.	Maple Valley	WA	98038	King	2037
55	Junction True Value Hardware	4747 44th Ave S.W.	Seattle	WA	98116	King	1471
56	Lake City Tweedy & Popp Hardware	3040 NE 127th St.	Seattle	WA	98125	King	460
57	Madison Park Hardware	1837 42nd Avenue East	Seattle	WA	98112	King	353
58	Maple Leaf Ace Hardware	9000 Roosevelt Way NE	Seattle	WA	98115	King	2416
59	McLendon Hardware	23662 104th Ave. SE	Kent	WA	98031	King	2960
60	McLendon Hardware	440 Rainier Ave. S	Renton	WA	98057	King	3176
61	McLendon Hardware	10210 16th Ave. SW	White Center	WA	98146	King	1548
62	McLendon Hardware	17705 130th Ave. NE	Woodinville	WA	98072	King	4129
63	Mercer Island Community and Event Center	8236 SE 24th St	Mercer Island	WA	98040	King	711
64	Mercer Island True Value Hardware	7707 SE 27th St. Suite 110	Mercer Island	WA	98040	King	176
65	North Seattle Household Hazardous Waste Collection Facility	12550 Stone Avenue North	Seattle	WA	98133	King	9828
66	Northshore Ace Hardware	35419 21ST Ave. S.W.	Federal Way	WA	98023	King	1501

67	Northshore Senior Center	10201 E Riverside Dr.	Bothell	WA	98011	King	80
68	Pacific Supply	1417 12th	Seattle	WA	98122	King	288
69	Recology CleanScapes	317 NW Gilman Road #22	Issaquah	WA	98027	King	1758
70	Recology CleanScapes	15235 Aurora Ave N. #102	Shoreline	WA	98133	King	955
71	Recology CleanScapes Burien Retail Store	16200 1st. S.	Burien	WA	98166	King	2337
72	Recology CleanScapes Retail Store	22833 Bothell-Everett Hwy, #111	Bothell	WA	98021	King	1611
73	Seattle Home Builders Center	1110 W Nickerson St.	Seattle	WA	98119	King	615
74	Second Use Building Materials	3223 6th Ave S	Seattle	WA	98134	King	1457
75	Shoreline Recycling and Transfer Station	2300 N 165th Street	Shoreline	WA	98133	King	7135
76	South Seattle Household Hazardous Waste Collection Facility	8100 2nd Avenue South	Seattle	WA	98108	King	6430
77	Stoneway Hardware and Supply	4318 Stone Way N.	Seattle	WA	98103	King	984
78	Stoneway Hardware Ballard	4910 15th Ave NW	Seattle	WA	98107	King	984
79	Total Reclaim	7021 S 220th St	Kent	WA	98032	King	0
80	Vashon Recycling and Transfer Station	18900 Westside Hwy SW	Vashon	WA	98070	King	2237
81	Wallingford Tweedy & Popp Hardware	1815 N 45th St. Ste. 112	Seattle	WA	98103	King	340
82	Bainbridge Island Ace Hardware	635 High School Road NE	Bainbridge Island	WA	98110	Kitsap	2738
83	Household Hazardous Waste Collection Facility	5551 SW Imperial Way	Bremerton	WA	98312	Kitsap	12902

84	Scott McLendon's Hardware	1692 Mile Hill Dr.	Port Orchard	WA	98366	Kitsap	3292
85	Stans Merry Mart	310 North Pearl Street	Ellensburg	WA	98926	Kittitas	661
86	Allyns Building Center	517 N Mill St.	Goldendale	WA	98620	Klickitat	0
87	BZ Corners Transfer Station	5 Firtee Rd	Husum	WA	98623	Klickitat	0
88	Dallesport Transfer Station	126 Tidyman Rd	Dallesport	WA	98617	Klickitat	0
89	Goldendale Transfer Station	1205 W Broadway St.	Goldendale	WA	98920	Klickitat	0
90	Lewis County Solid Waste	1411 So Tower Ave.	Centralia	WA	98531	Lewis	5979
91	Mason County Landfill	501 Eells Hill Rd	Shelton	WA	98584	Mason	1584
92	Scott McLendon's Hardware	51 NE State Route 300	Belfair	WA	98528	Mason	1744
93	Ellisforde Transfer Station	65 Swanson Mill Rd.	Oroville	WA	98844	Okanogan	0
94	Lee Frank Mercantile	324 S. Whitcomb Ave.	Tonasket	WA	98855	Okanogan	84
95	Methow Recycles	12 Twisp Airport Road	Twisp	WA	98856	Okanogan	293
96	Okanogan County Central Landfill	241 North B&O Rd.	Twisp	WA	98840	Okanogan	0
97	Ace Hardware	4816 Pt. Fosdick Dr. NW	Gig Harbor	WA	98335	Pierce	2521
98	Bartell Drugs	2700 Bridgeport Wy W Suite D	University Place	WA	98466	Pierce	0
99	Batteries Plus Bulbs	31830 Pacific Hwy S	Federal Way	WA	98003	Pierce	1267
100	Batteries Plus Bulbs	10210 123rd St. Ct. E	Puyallup	WA	98374	Pierce	507
101	Batteries Plus Bulbs	4027 Tacoma Mall Blvd.	Tacoma	WA	98409	Pierce	2788
102	Dupont Ace Hardware	1585A McNeil St.	Dupont	WA	98327	Pierce	48
103	JBLM DPW Environmental Operations	Bldg. 1210 Mann Ave. Box 339500 MS #17	Joint Base Lewis McChord	WA	98433	Pierce	8307
104	Lakewood Ace Hardware	8123 Steilacoom Blvd. SW	Lakewood	WA	98498	Pierce	764
105	McLendon Hardware	11307 Canyon Rd. E	Puyallup	WA	98373	Pierce	1691
106	McLendon Hardware	1111 Fryer Ave.	Sumner	WA	98390	Pierce	2697
107	McLendon Hardware	1015 N. Pearl Street	Tacoma	WA	98406	Pierce	2416

108	Ace Hardware of Friday Harbor	340 Argyle Avenue	Friday Harbor	WA	98250	San Juan	1693
109	CT Recycling	6739 Roche Harbor Road	Friday Harbor	WA	98250	San Juan	341
110	Lopez Solid Waste	2449 Fisherman Bay Road	Lopez Island	WA	98261	San Juan	834
111	The Exchange/Orcas Recycling Services	3398 Orcas Road	Eastsound	WA	98245	San Juan	912
112	Ace Hardware of Anacortes	1720 "Q" Avenue	Anacortes	WA	98221	Skagit	1457
113	Chuckanut Lighting	938 Fountain St.	Burlington	WA	98233	Skagit	370
114	City Recycling Center	315 Sterling Street	Sedro-Woolley	WA	98284	Skagit	3627
115	Ekrem Hardware Do-It Center	237 E. Fairhaven Ave.	Burlington	WA	98233	Skagit	611
116	Skagit County Household Hazardous Waste Facility	14104 Ovenell Rd	Mount Vernon	WA	98273	Skagit	4002
117	Columbia Hardware	24 NE 2nd St	Stevenson	WA	98648	Skamania	0
118	Stevenson Transfer Facility	1332 Ryan Allen Rd.	Stevenson	WA	98648	Skamania	1834
119	Underwood Transfer Facility	1402 Little Buck Creek Rd.	Underwood	WA	98650	Skamania	0
120	Ace Hardware	303 91st Ave NE	Lake Stevens	WA	98258	Snohomish	1206
121	Ace Hardware of Evergreen Way	4835 Evergreen Way	Everett	WA	98203	Snohomish	148
122	Airport Road Recycling & Transfer Station	10700 Minuteman Dr.	Everett	WA	98204	Snohomish	0
123	Batteries Plus Bulbs	909 SE Everett Mall Way	Everett	WA	98208	Snohomish	1766
124	Batteries Plus Bulbs	4008 172nd St NE, Suite D	Arlington	WA	98223	Snohomish	466
125	City of Mill Creek	15728 Main Street	Mill Creek	WA	98012	Snohomish	428
126	City of Monroe	City Hall at City of Monroe	Monroe	WA	98272	Snohomish	34
127	Darrington Hardware & Supply	1220 SR 530 NE	Darrington	WA	98241	Snohomish	232

128	Dubuque Road Neighborhood Recycling & Disposal Center	19619 Dubuque Road	Snohomish	WA	98290	Snohomish	0
129	Granite Falls Neighborhood Recycling & Disposal Center	7526 Menzel Lake Road	Granite Falls	WA	98252	Snohomish	0
130	Homegrown Hydros	1241 State Ave, #102	Marysville	WA	98270	Snohomish	260
131	Household Hazardous Waste Drop-off Station	3434 McDougall Ave.	Everett	WA	98201	Snohomish	68115
132	Mukilteo Ace Hardware	12680 Mukilteo Speedway	Mukilteo	WA	98275	Snohomish	1092
133	North County Recycling & Transfer Station	19600 63rd Ave. NE	Arlington	WA	98223	Snohomish	0
134	Southwest Recycling & Transfer Station	21311 61st Place West	Mountlake Terrace	WA	98043	Snohomish	0
135	Sultan Neighborhood Recycling & Disposal Center	33014 Cascade View Drive	Sultan	WA	98294	Snohomish	0
136	Batteries Plus Bulbs	11101 East Sprague	Spokane	WA	99206	Spokane	2509
137	Batteries Plus Bulbs	7704 North Division Suite C	Spokane	WA	99208	Spokane	2509
138	Deer Park Ace Hardware	141 West H Street	Deer Park	WA	99006	Spokane	823
139	South Hill Ace Hardware	4416 S. Regal St.	Spokane	WA	99223	Spokane	1067
140	Spokane Valley Ace Hardware	15405 E. Sprague Ave	Spokane Valley	WA	99037	Spokane	45
141	Sunshine Disposal and Recycling	2405 N. University Rd.	Spokane Valley	WA	99206	Spokane	6364
142	Wandermere Ace Hardware	12908 N. Hwy. 395	Spokane	WA	99218	Spokane	116
143	Waste Connections of Spokane	22123 N. Elk-Chattaroy Road	Colbert	WA	99005	Spokane	6363
144	Waste Connections of Spokane	3941 North Sullivan Road	Spokane Valley	WA	99216	Spokane	6836

145	Colville Hardware Do It Center	984 S. Main St.	Colville	WA	99114	Stevens	2087
146	Sety's Ace Hardware	301 E. Main	Chewelah	WA	99109	Stevens	0
147	Batteries Plus Bulbs	2905 Capital Mall Dr. SW	Olympia	WA	98502	Thurston	760
148	Lincoln Creek Lumber/Ace Hardware	2421 93rd Ave SW	Tumwater	WA	98512	Thurston	575
149	Olympia Ace Hardware	400 Cooper Point Road	Olympia	WA	98502	Thurston	1392
150	Thurston County Hazohouse	2420 Hogum Bay Rd NE	Lacey	WA	98516	Thurston	14529
151	Batteries Plus Bulbs	632 South 9th Ave.	Walla Walla	WA	99362	Walla Walla	3660
152	Sudbury Regional Landfill, City of Walla Walla	414 Landfill Rd.	Walla Walla	WA	99362	Walla Walla	1060
153	City of Lynden	300 4th St	Lynden	WA	98264	Whatcom	0
154	Ferndale Ace Hardware	5715 4th Ave.	Ferndale	WA	98248	Whatcom	1050
155	Pacific Building Center - True Value Hardware	2677 Bell Road	Blaine	WA	98230	Whatcom	120
156	WFC Blaine Ace Hardware	1733 H Street Suite 700	Blaine	WA	98230	Whatcom	0
157	Whatcom County Disposal of Toxics Facility	3505 Airport Drive	Bellingham	WA	98226	Whatcom	17100
158	Pullman Disposal Service	135 NW Harold Dr.	Pullman	WA	99163	Whitman	579
159	Whitman County Public Works Solid Waste Facility	252 Landfill Road	Pullman	WA	99163	Whitman	712
160	Batteries Plus Bulbs	1731 S 1st St.	Yakima	WA	98901	Yakima	1300
161	City of Sunnyside	818 East Edison	Sunnyside	WA	98944	Yakima	0
162	Riders True Value	117 E Winew Country Rd.	Grandview	WA	98930	Yakima	88
163	Bartell Drugs	7370 170th Ave NE	Redmond	WA	98052	King	676

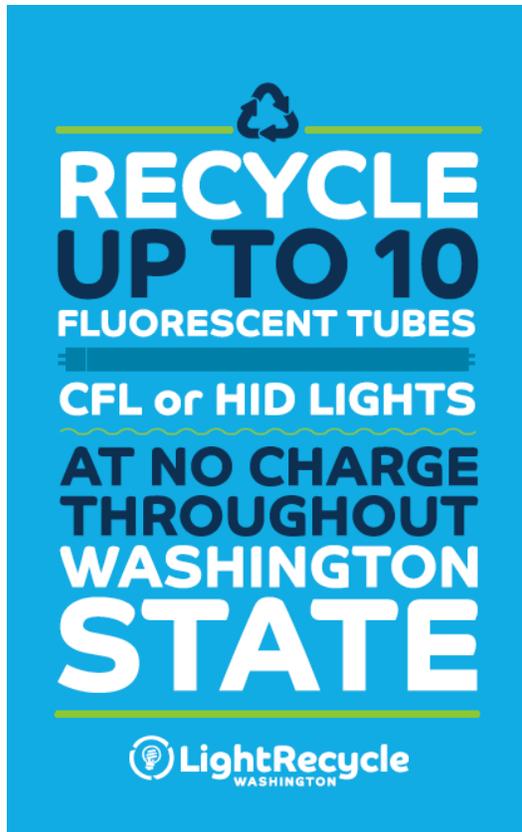
Table 7: Registered Collection Sites that accept CFLs only:

	Collection Site Name	Address	City	State	Zip Code	County
1	Clark Public Utilities - Operations Office	8600 NE 117 Ave.	Vancouver	WA	98662	Clark
2	Clark Public Utilities - Electric Center	1200 Fort Vancouver Way	Vancouver	WA	98663	Clark
3	Bartell Drugs	14901 4th Ave SW, Suite 100	Burien	WA	98166-1906	King
4	Bartell Drugs	2222 32nd Ave. W.	Seattle	WA	98199-4044	King
5	Bartell Drugs	3018 NE 125th Street	Seattle	WA	98125-4424	King
6	Bartell Drugs	2700 NE University Village St.	Seattle	WA	98105-5016	King
7	Bartell Drugs	1628 Fifth Avenue	Seattle	WA	98101-1606	King
8	Bartell Drugs	910 Fourth Ave	Seattle	WA	98164-1000	King
9	Bartell Drugs	1500 NW Market Street, Suite 101	Seattle	WA	98107-5211	King
10	Bartell Drugs	5625 22nd AVE NW	Seattle	WA	98107	King
11	Bartell Drugs	2345-42nd Avenue SW	Seattle	WA	98116-2513	King
12	Bartell Drugs	18001 Bothell-Everett Hwy, Suite 101	Bothell	WA	98012-1660	King
13	Bartell Drugs	11919 NE 8th St.	Bellevue	WA	98005-3023	King
14	Kirkland City Hall	123 5th Ave	Kirkland	WA	98033	King
15	Orcas Power and Light Cooperative	183 Mt. Baker Rd.	Eastsound	WA	98245	San Juan
16	Orcas Power and Light Cooperative	1034 Guard St.	Friday Harbor	WA	98250	San Juan
17	Bartell Drugs	621 SR9 N.E.	Lake Stevens	WA	98258-8525	Snohomish
18	Bartell Drugs	5006 132nd ST SE Building A	Everett	WA	98208-9517	Snohomish
19	Everett Community College	2000 Tower Street	Everett	WA	98201	Snohomish
20	Bartell Drugs	17633 Highway 99	Lynnwood	WA	98037-3627	Snohomish
21	Bellingham Ace Hardware	356 36th St.	Bellingham	WA	98225	Whatcom

Appendix D: Education and Outreach Materials

The following images are examples of the education and outreach materials used by LightRecycle Washington in 2023.

1. INFORMATION CARD, 5" X 8"



2. COLLECTION SITE POSTERS, 11" X 17"



RECYCLE
FLUORESCENT, CFL & HID



LIGHTS



AT NO CHARGE
HERE

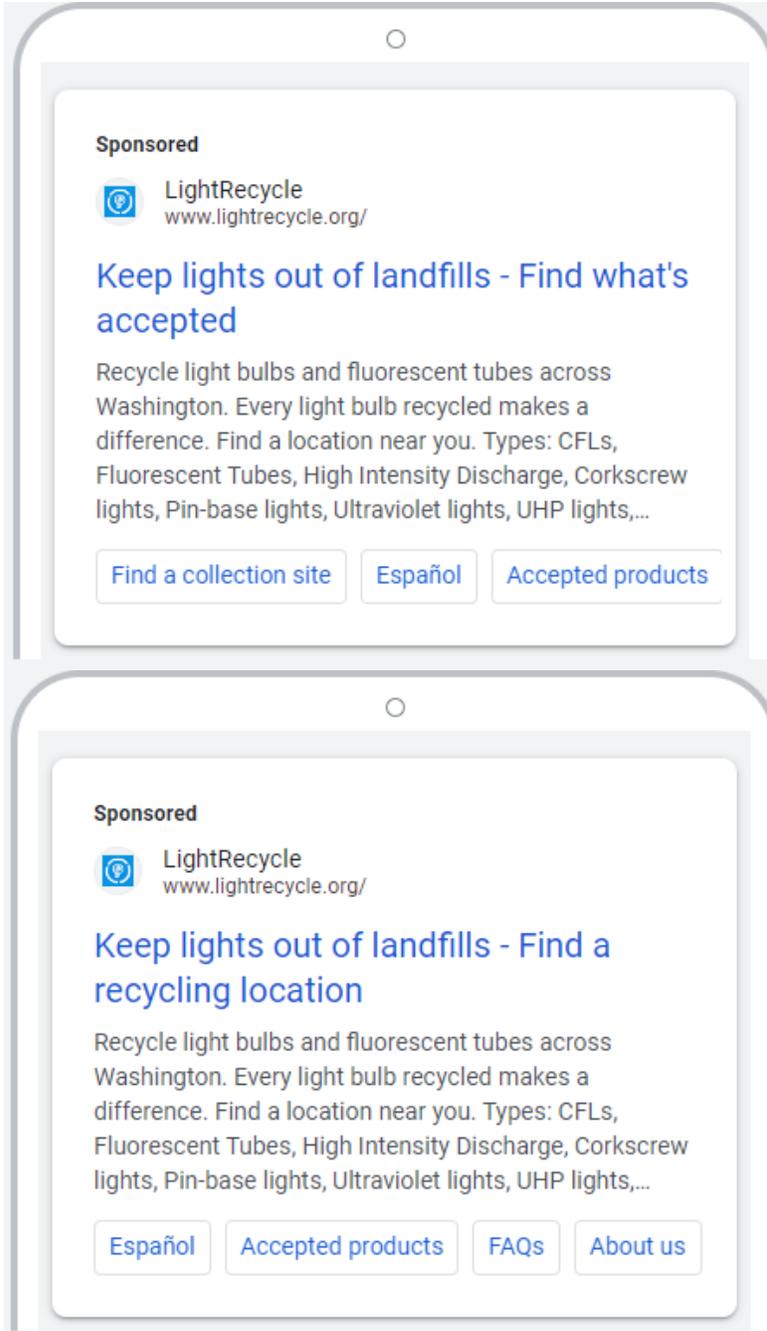
Recycle up to 10 lights per day!
For more information and to find other collection sites throughout the state visit LightRecycle.org or call us toll-free on 1-877-592-2972.

A PCA Product Stewardship program
501(c)(3) non-profit



3. DIGITAL ADVERTISING

3.1 Google Search – Program Awareness



3.2 Meta ads – Program Awareness

The image displays two examples of sponsored advertisements for LightRecycle Washington. The left advertisement is a Facebook post. At the top, it shows the LightRecycle Washington profile with a 'Sponsored' label and a close button. The main text reads: 'The mercury from fluorescent lights and HID's has potential to harm human health and the environment if not properly ...See more'. Below this is a video player with a play button, showing three compact fluorescent light bulbs against a blue and green background. The video title is 'Need to dispose of light bulbs?'. Below the video, the text says 'lightrecycle.org Recycle mercury containing lights in...' with a 'Learn more' button. At the bottom, it shows engagement metrics: 72 reactions (likes, love, wow), 13 comments, and 22 shares, along with 'Like', 'Comment', and 'Share' buttons.

The right advertisement is an Instagram post. It features the Instagram logo at the top. The ad content includes the text 'Visit lightrecycle.org' in a dark blue rounded rectangle, with a hand holding a smartphone displaying the LightRecycle website. Below the image, it says 'Learn more' with a right-pointing arrow. At the bottom, there are icons for heart, comment, share, and bookmark, followed by the text: 'The mercury from fluorescent lights and HID's has potential to harm human health and the environ... more'.

Video sequence for Meta ads:

Need to dispose of light bulbs?

Recycle them for free!

Find the collection site or event near your community

Visit lightrecycle.org

and follow the steps

ENTER LOCATION

SELECT PRODUCT

ABOUT

READ MORE

3.3 Facebook Event Ads

Example (event approaching)



The image shows a Facebook event advertisement for 'LightRecycle Washington'. At the top, the event name is displayed with a lightbulb icon, a 'Sponsored' label, and a close button. Below this, a text line reads 'Recycle CFLs, HID and Fluorescent Tubes for free. Click below to learn more:'. The main visual is a dark blue banner with the text 'Lights Recycling Event at Cathlamet' in white and green. Below the banner, there are images of a fluorescent tube and three CFL bulbs. The event date is 'MON, NOV 6, 2023'. Below the date, the event title 'Lights Recycling Event at Cathlamet' is shown next to an 'Interested' button. At the bottom, there are icons for 'Like' (2), 'Comment' (2 comments), and 'Share'.

LightRecycle Washington
Sponsored · 🌐

Recycle CFLs, HID and Fluorescent Tubes for free. Click below to learn more:

**Lights Recycling
Event at Cathlamet**

MON, NOV 6, 2023

Lights Recycling Event at Cathlamet **Interested**

👍 2 2 comments

👍 Like 💬 Comment ➦ Share

Example (Event open)



Lights Recycling Event at Cathlamet

NOV 6, 2023 AT 8 AM – NOV 11, 2023 AT 3 PM

Lights Recycling Event at Cathlamet

Cathlamet Building Materials

[About](#) [Discussion](#) Invite as Alexis Gaalván ...

Details

- 17 people responded
- Event by LightRecycle Washington
- Cathlamet Building Materials
- Duration: 6 days
- Public · Anyone on or off Facebook

Recycle mercury-containing lights.

Accepted items:

- Compact Fluorescent Lights (CFLs)
- Fluorescent Tubes
- High Intensity Discharge (HID)... [See more](#)

[Social issues](#) [Cathlamet, Washington](#)



Cathlamet Building Materials
57 Main St, Cathlamet, WA 98612-4201, United States

Appendix E: Processor Compliance Audit

The following is the 2023 compliance audit report of the Programs processor Ecolights Northwest, LLC conducted by Greeneye Partners, LLC, on July 7, 2023.



RIOS: 2016 Internal Audit Report

Company Name	EcoLights
Company Address	1915 Corgiat Dr S, Seattle, WA 98108
Company Contact Person	Arnold Diep
Company Telephone	206-518-7513

Audit Type	RIOS:2016 Internal Audit
Audit Date	July 7th, 2023

Executive Summary of Audit Results

An internal audit of the EcoLights facility located at 1915 Corgiat Dr S, Seattle, WA 98108 was performed on July 7th, 2023. The purpose of the audit was to evaluate the Quality, Environmental, Health and Safety Management System and its conformance to the RIOS:2016 standard, and to meet the requirements of RIOS, clause 5.3 "Internal RIOS Audits". The audit was performed by Tom Delich, RIOS internal auditor. The audit of the audit was conducted by Nicole Delich, RIOS auditor.

Findings are listed at the end of the report and in the applicable sections.

- 5 Non-conformances have been identified which should be entered into your corrective action process.
- 7 Opportunities for Improvement have been identified which do not require any further action.

I would like to thank Arnold Diep, Jesse McCullough and the entire EcoLights staff for their hospitality and cooperation during this audit.

Audit Scope, Plan and Summary				
Audit Dates		July 7th, 2023		
Audit Plan		See attached		
Number of Non conformances		Major	0	Minor 5
Standard(s) the QEHSMS was audited against in order to determine conformance to				
1)	RIOS:2016	3)		
2)		4)		
Audit Team Leader, Contact Information				
Tom Delich				
Greeneye Partners				
15845 Eastbend Way				
Apple Valley, MN 55124				
952-381-5898				
Scope of Quality, Environmental, Health and Safety Management System that is to be audited.				
Proper handling of refrigerants, E-Waste, and UW lamps, batteries, and mercury-containing equipment.				
Distribution of the Audit Report				
Arnold Diep - EcoLights				
Jesse McCullough - EcoLights				

Audit Report	NC, OFI
<p>Process/Area Audited: General Requirements, QEH&S Policy</p> <p><u>Standard Clauses:</u> RIOS 1.0 General Requirements, 1.1 Scope and Application RIOS 2.0 Policy</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Quality, Environmental, Health and Safety Policy, Process Flow Diagram, Interaction of Processes Diagram</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>The EcoLights facility at 1915 Corgiat Dr S, Seattle, WA 98108 is approx. 38,000 square feet. The facility currently has 10 fulltime employees. The facility opened in 1996.</p> <p>Reviewed the QEHS Policy dated 4-24-23. Employees receive training on the policy during new hire training. The policy is also communicated on the website.</p> <p>Reviewed the QEHSMS Manual, rev 1.4. Reviewed the Process Flow Diagram, which describes the processes from receipt to sales and shipping. Reviewed the Interaction of Processes Diagram which describes the management system processes.</p> <p>Reviewed the scope statement "Proper handling of refrigerants, E-Waste, and UW lamps, batteries, and mercury-containing equipment" which is appropriate to the organization.</p>	<p>OFI 01</p> <p>OFI 02</p>

<p>Reviewed the 2023 Certificate of RIOS membership.</p> <p>OFI 01 – Ensure the Process Flow Diagram has an effective date.</p> <p>OFI 02 – Ensure current QEHS Policy is posted in the warehouse.</p>	
<p>Process/Area Audited: QEH&S Infrastructure</p> <p><u>Standard Clauses</u> RIOS 1.2.1 Management Structure RIOS 1.2.2 Resources RIOS 1.2.3 Senior Management</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Responsibility Matrix, Organization Chart, Resource Plan</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>Roles, responsibilities, and authorities have been defined and documented in the QEH&S Manual, Responsibility Matrix, Organization Chart, EcoLights procedures/work instructions, and are communicated to those affected individuals.</p> <p>Senior Management has designated the VP of Operations, a member of senior management, to ensure health and safety is properly addressed and managed within QEH&SMS.</p> <p>Senior Management has designated the QEHS Coordinator as the QEH&S Management Representative.</p> <p>Top Management has committed resources to the QEHS management system, including hiring consultants, providing resources for a new ERP, and hiring personnel to upkeep the system.</p> <p>Reviewed the Responsibility Matrix, which shows the roles and responsibilities specifically for the CEO, Operations Manager, QEHS Mgmt Rep, Human Resources, Sales, Supervisors and Employees.</p> <p>Reviewed the Org Chart rev 1.2, which shows the individuals involved in EcoLights.</p> <p>Employees interviewed had a good understanding of their roles and responsibilities within EcoLights' QEH&SMS.</p>	
<p>Process/Area Audited: Document and Recordkeeping Control</p> <p><u>Standard Clause</u> RIOS 1.3 Document and Recordkeeping Controls</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Document and Record Control Procedure, Master List of Documents, Records Management Table</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p>	

<p>Results: Conforms</p> <p>Reviewed the Document and Record Control Procedure, rev 1.0. Documents and records included in the QEH&S management system are listed on the Master Document List and Records Management Table.</p> <p>The QEH&S Mgmt Rep is responsible for document control and manages changes through the Master List of Documents. QEH&SMS documents are controlled with the document name, revision, and effective date in the footer.</p> <p>Reviewed the Master List of Documents and checked the SharePoint folder for the current version of the following documents: Process Flow Diagram rev. 1.3, Outside Provider Procedure rev 1.3, Health and Safety Manual rev 1.4.</p> <p>Records are controlled according to the Document and Record Control Procedure. Records are listed on the Records Management Table. Records are kept for three to five years, except for H&S records which are kept for 30 years after employment. All requested records were available unless otherwise noted.</p> <p>Reviewed documents and records are listed throughout the audit report.</p>	
<p>Process/Area Audited: QEH&S Footprint</p> <p><u>Standard Clauses</u></p> <p>RIOS 3.1.1 Important Quality Risks</p> <p>RIOS 3.1.2 Important Environmental Impacts</p> <p>RIOS 3.1.3 Important Health & Safety Risks</p> <p>RIOS 3.1.4 Legal Requirements</p> <p>RIOS 3.1.5 Product, Service and Customer Requirements</p> <p>RIOS 3.1.6 Other Stakeholder Requirements</p> <p>Documents and Records Reviewed: QEH&SMS Manual, RIOS Footprint Procedure, QEH&S Risks, Aspects and Hazards List, Important QEH&S Risks, Aspects and Hazards Worksheet, PPE Hazard Assessment Procedure, PPE Hazard Assessment Form, Legal and Other Requirement Identification Procedure, Legal and Other Requirements Summary List, Import Export Requirement Summary List, EHS Compliance Calendar, Stakeholder Requirement Procedure, Stakeholder Requirements Summary List</p> <p>Interviewees/Participants: Arnold Diep (QEH&S Coordinator)</p> <p>Results: Partially Conforms</p> <p>Reviewed the Risks and Opportunities Matrix rev. 1.2, which identifies 3 risks and 3 opportunities for the QEH&SMS.</p> <p>Quality risks are documented on the Quality Risk Assessment. Risks include:</p> <ul style="list-style-type: none"> • Scale Weight is not accurate • Source material is non-conforming • Stolen material • Incorrect Sorting • Incorrect Dismantling • Data bearing material not properly sanitized 	<p>NC 01</p> <p>OFI 03</p> <p>OFI 04</p> <p>OFI 05</p>

- Shredded material size is incorrect
- Measurements are incorrect
- Loss of customer property
- Product tracking fails
- Outside provider not qualified
- Customer/downstreams not qualified to purchase
- Product is not wanted by customer
- Improper packaging
- Product damaged in shipping
- Product does not work

EH&S risks are documented on the EHS Aspects and Hazards tab of the QEHS Risks, Aspects and Hazards List. The QEHS Management Rep met with Senior Management to identify and categorize environmental aspects and health and safety hazards in each process area. Environmental aspects and Health and Safety Risks were ranked on a 1-5 scale of likelihood times a 1-5 scale of consequence. If the rating score is 20 or higher, the aspect/risk is considered important.

Important environmental impacts include:

- Air emissions dust/fumes
- Generation of hew/universal waste
- Generation of hazardous waste
- Chemicals/hazardous substances, potential spill or release
- Potential data security breach

Important H&S hazards include:

- Air emissions dust/fumes
- Noise
- Electricity usage/hazardous energy/lock-out tag-out
- Generation of hew/universal waste
- Generation of hazardous waste
- Chemicals/hazardous substances, potential spill or release
- Operations of forklifts and traffic movements

Reviewed the PPE Hazard Assessment dated 8-27-20 for the Lamp Crusher. Required PPE includes Full face respirator, Coveralls, Safety Shoes, and Hearing Protection.

Reviewed the Legal and Other Requirements Procedure. The QEHS Management Rep is responsible for identifying and keeping track of legal requirements. Reviewed the Legal and Other Requirements Summary List, which includes requirements for Hazardous and Universal waste, Transport, Health and Safety, Data Security and Voluntary requirements, the OECD regulations and data security laws.

Ecolights receives legal updates through websites, email lists, and consultants.

Reviewed the Interested Party Analysis, rev 1.3 that lists interested parties such as Owners, Customers, Employees, Visitors, Communities, Neighbors, Landlord, Downstream Vendors, Suppliers, Regulators and NGOs.

See Compliance Evaluation Audit for review of legal requirements.

<p>NC 01 – The Risks and Opportunities Matrix has not been reviewed at the specified frequency.</p> <p>OFI 03 – Consider filling in the category for the type of Risks and Opportunities identified in the matrix. (Ex. Quality, Environmental, Health and Safety)</p> <p>OFI 04 – Consider documenting required permits and licenses on the compliance obligation summary lists. (Ex. Business Licenses, Reseller Permit, Certificate of Boiler, Fire Permits)</p> <p>OFI 05 – Consider Completing the Risk Assessment form or editing the 6.1.1.1 Risk Assessment Procedure to only conduct the Risk Assessment for when going for e-Stewards certification.</p>	
<p>Process/Area Audited: Improvement Planning</p> <p><u>Standard Clauses</u> RIOS 3.2 Improvement Planning</p> <p>Documents and Records Reviewed: Goals Program Form</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>The 2023 Goal - Health & Safety: Effectively reduce risk of mercury exposure in order to ensure the health and safety of the lamp technicians. Target: Mercury exposure levels below thresholds of concern. Objective includes 5 programs that are in progress.</p> <p>The 2023 Goal – Environmental: Minimize risk of accidental electrical discharge from batteries and chance of fire. Objective includes 4 programs in progress.</p> <p>The 2023 Goal – Quality: Enhance customer satisfaction. Target is positive customer reviews and surveys. Objective includes 5 programs that have not begun. No monthly progress updates have been recorded so far.</p>	
<p>Process/Area Audited: Change Management</p> <p><u>Standard Clauses</u> RIOS 3.3 Change Management</p> <p>Documents and Records Reviewed: Change Management Procedure, Change Management Form</p> <p>Interviewees/ Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>Planned changes are documented according to the Change Management Procedure. No change Management forms have been needed so far.</p>	
<p>Process/Area Audited: Recycler Knowledge</p> <p><u>Standard Clause</u> RIOS 4.1 Recycler Knowledge</p>	

<p>Documents and Records Reviewed: QEH&SMS Manual, Competence, Training and Awareness Procedure, Training Needs Matrix, Training and Competence Record</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>Reviewed the Competence, Training and Awareness Procedure.</p> <p>QEHS Coordinator takes Insperity courses and gives workers training.</p> <p>General Awareness, Hazard Communication and Forklift training was completed on 6-20-23, which included 10 employees.</p> <p>Reviewed PPE, Respiratory Protection and Hazard Communication training completed on 4-14-23, 10 employees were in attendance.</p> <p>Reviewed forklift operation training record for Phillip Nelsen dated 6-23-23.</p>	
<p>Process/Area Audited: Communication</p> <p><u>Standard Clause</u> RIOS 4.2 Communication</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Communication Procedure, External Communication Log, Visitor and Contractor Sign In Log Book, Visitor and Contractor EHS Requirements, External Communication Log</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Partially Conforms</p> <p>Reviewed the Communication Procedure rev 1.3, which lists internal communication, customer communication, supplier communication, outside provider communication, and external communication.</p> <p>Internal communication includes verbal, on the job trainings, postings on bulletin boards and group trainings. External communication is through the EcoLights website, emails, and phone calls. Customer communication is handled through phone, emails, and written contracts.</p> <p>Reviewed the Visitor and Contractor Sign In Log and Visitor and Contractor EHS Requirements, which is available at the EcoLights Office sign in area.</p> <p>Interested Party Communication is logged on the External Communication Log. Reviewed External Communication Log dated 12-6-22 with King County for discharging condensate with trace amount of mercury. Discharge approval was granted.</p> <p>NC 02 – Scope Statement is not posted on the website according to the Communications Procedure.</p> <p>NC 03 – No evidence of Customer Satisfaction Surveys was available for review.</p>	<p>NC 02</p> <p>NC 03</p>

<p>Process/Area Audited: Operational Control – Source Material and Outsourced Providers, Products and Services</p> <p><u>Standard Clause</u> RIOS 4.3 Operational Control</p> <p>Documents and Records Reviewed: QEHSMS Manual, Supplier Source Control, Outsourced Providers Procedure</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Partially Conforms</p> <p>Reviewed the Supplier Source Control Procedure, rev 1.0. Scope of work and contracts are maintained for upstream customers.</p> <p>Reviewed the Outsourced Providers Procedure, rev 1.3. Reviewed Approved External Provider lists, downstream providers and providers of disposal, transportation, and services.</p> <p>Reviewed Outside Provider Questionnaire for Cintas dated 6-26-23.</p> <p>Transporters are selected based on the Transportation Qualification Procedure. Reviewed Transporter Letter and Checklist for Total Quality Logistics dated 5-31-23.</p> <p>NC 04 – Outside Providers of Services and Republic Services have not been reviewed within the last year. Outside Provider questionnaires were not available for the Cheyenne Scale Company or Fire Extinguisher Companies.</p>	<p>NC 04</p>
<p>Process/Area Audited: Operational Control – Receiving, Sorting, Dismantling</p> <p><u>Standard Clause</u> RIOS 4.4 Quality Controls RIOS 4.5 Environmental Controls RIOS 4.6 Health & Safety Controls</p> <p>Documents and Records Reviewed: QEHSMS Manual, Receiving Procedure, Sorting Procedure, Dismantling Procedure, Material Storage and Shipping Procedure</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>Reviewed operations control procedures and toured the warehouse to ensure procedures were followed. Interviewed personnel had a good understanding of the work that they were doing and how that effected the QEHSMS. Employees were able to highlight important health and safety risks and environmental aspects in their respective areas.</p> <p>Observed proper storage of universal waste batteries. Observed UW labels with start accumulation dates on batteries and fluorescent tubes. No universal waste was observed to have a start accumulation date over one year.</p>	
<p>Process/Area Audited: Health and Safety Controls and Emergency Preparedness</p>	

<p><u>Standard Clause</u> RIOS 4.6 Health and Safety Controls RIOS 4.7 Emergency Preparedness</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Health and Safety Manual, EH&S Aspects and Hazards List, Personal Protective Equipment Program, PPE Hazard Assessment Form, Evacuation Plan, Emergency Contact List, Weekly Facility Inspection Checklist, Emergency Contact List, Facility Map, Incident Report Form, Forklift Operator’s Daily Checklist. Emergency Preparedness and Response Procedure</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Partially Conforms</p> <p>Health and Safety programs are documented in the Health and Safety Manual, which includes programs for fourteen programs including Emergency Action Plan, Ergonomic Program, Forklifts, Housekeeping, Injury and Illness Prevention Program, Hazard Communication and Safety Committees.</p> <p>All employees receive emergency training upon hire. Employees were trained on what to do in case of an emergency and where the evacuation meeting point was and where to go in case of severe weather.</p> <p>Reviewed the Emergency Procedures. Reviewed the Facility Map, which includes the location of the fire extinguishers. Observed the presence of lighted exit signs, eye wash stations, first aid kits, mercury spill kits, labor law posters and SDS binder. Reviewed the 2022 OSHA 300A log posted breakroom. There were no recordable incidents.</p> <p>Reviewed the Housekeeping Procedure in the Health and Safety Manual. Housekeeping is monitored on the Weekly Facility Inspection Checklist. Housekeeping at the facility was good. See monitoring and measurement section for review of a Weekly Facility Inspection Checklist record.</p> <p>Safety committee meetings are planned quarterly. Reviewed safety meetings minutes dated 7-3-23 Records include the meeting minutes and attendees.</p> <p>Hazards that are in e-Waste material are listed in the Hazard Communication Program and also in SDS binder, which is located at the receiving desk and online. SDS binder includes Valvoline 90W Oil.</p> <p>Reviewed the emergency response drill record on 6-8-23 for a fire drill.</p> <p>Observed welding equipment in the maintenance area, which has been designated as a hot works area. Observed barriers used when welding.</p> <p>Observed fire extinguishers throughout the warehouse, which were inspected annually by Northwest Fire Systems in March 2023 and monthly thereafter.</p> <p>Jerome Meter reading are taken 3x a day in the lamp room. If a reading is above 0.025 mg/m3 the room is shut down and cleaned. Reviewed Jerome Meter readings for the week of 7-3-22. The room was shut down twice this week due to the action level being hit.</p>	<p>NC 05</p> <p>OFI 06</p> <p>OFI 07</p>
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Reviewed Respiratory Protection program in the Health and Safety Manual. Reviewed respirator fit testing for Oudom Norng dated 1-25-23. Employees have heavy metal medical sampling conducted randomly at least once a year.

Reviewed Noise Monitoring conducted on 1-30-18. The monitoring was taken with Extech Digital Decibel meter 407732. A Hearing Conservation Program is required for the lamp room and shatter shield station. The entire warehouse is under a hearing conservation program. Reviewed hearing protection fit records and baseline tests for employees dated 6-22-23.

NC 05 – LOTO Annual Inspection was not available for review.

OFI 06 – Ensure emergency drills are recorded on the proper form: 8.2.4 Emergency Drill Record.

OFI 07 – Ensure current Emergency Contact Lists are posted.

Process/Area Audited: **Monitoring and Measuring**

Standard Clause

RIOS 5.1.1 Activities Requiring Monitoring and Measurement

RIOS 5.1.2 QEH&S Compliance

RIOS 5.1.3 Maintenance and Calibration of Monitoring Equipment

RIOS 5.1.4 Analysis of Monitoring and Measurement Results

Documents and Records Reviewed: QEH&SMS Manual, Monitoring and Measurement Procedure, Important EH&S Aspects and Hazards Worksheet, Weekly Facility Inspection Checklist, Health and Safety Manual, Goals Program Form, Supplier Source Control Procedure, Management Review Agenda and Meeting Minutes

Interviewees/Participants: Arnold Diep (QEHS Coordinator)

Results: **Conforms**

Monitoring and measurements for each important aspect and risk are listed on the QEH&S Risks, Aspects and Hazards List.

Reviewed scale calibration dated 6-19-23 for the receiving scale. Calibration was performed by Cheyenne Scale Company.

Weekly inspection checklists are being used for monitoring, issues are documented on the bottom of the inspection checklist. Reviewed the Ecolights Environmental Inspection Checklist record dated 6-30-23.

EH&S Incidents are recorded on the Incident Report Form.

Reviewed the 2022 OSHA 300A Log posted in breakroom. There were no health and safety incidents/accidents in 2022.

Compliance evaluations are conducted annually. A compliance evaluation audit was completed alongside this internal audit. The report indicated 2 findings that are also included on this report.

Process/Area Audited: **Nonconformance and Corrective Action**

<p><u>Standard Clause</u> RIOS 5.2.1 Control of Nonconforming Product RIOS 5.2.2 EH&S Incident Investigation RIOS 5.2.3 Nonconformance and Corrective Action</p> <p>Documents and Records Reviewed: Incident Investigation, Nonconformity and Corrective Action Procedure, Corrective Action Report, Corrective Action Log, Incident Report Form</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>No corrective action reports have been needed to be completed recently.</p> <p>If non-conforming material is found it will be segregated, a non-conforming material form will be filled out and EcoLights will either return the material to the customer or send to an appropriate downstream vendor.</p>	
<p>Process/Area Audited: Internal RIOS Audit – reviewed by Nicole Delich</p> <p><u>Standard Clause</u> RIOS 5.3 Internal RIOS Audit</p> <p>Documents and Records Reviewed: Internal Audit Procedure</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>The internal audit process is planned and implemented. EcoLights has elected to use third party internal auditors. A full internal audit was conducted July 7th, 2023 and records maintained. All areas of the standards were included in the internal audit plan and report. Audit was conducted by a RIOS trained internal auditor. Certificates are attached to the internal audit report.</p>	
<p>Process/Area Audited: Management Review</p> <p><u>Standard Clause</u> RIOS 6.0 Management Review</p> <p>Documents and Records Reviewed: QEH&SMS Manual, Management Review Meeting Agenda & Minutes</p> <p>Interviewees/Participants: Arnold Diep (QEHS Coordinator)</p> <p>Results: Conforms</p> <p>Management Review meetings are planned annually. Reviewed Management Review Meeting Agenda & Minutes dated 7-5-23, which discussed all required inputs and outputs.</p> <p>Continual improvement includes the addition of new standards and improvement of training.</p>	

SUMMARY OF FINDINGS

Non-conformances

NC 01 – The Risks and Opportunities Matrix has not been reviewed at the specified frequency.

NC 02 – Scope Statement is not posted on the website according to the Communications Procedure.

NC 03 – No evidence of Customer Satisfaction Surveys was available for review.

NC 04 – Outside Providers of Services and Republic Services have not been reviewed within the last year. Outside Provider questionnaires were not available for the Cheyenne Scale Company or Fire Extinguisher Companies.

NC 05 – LOTO Annual Inspection was not available for review.

Opportunity for Improvement

OFI 01 – Ensure the Process Flow Diagram has an effective date.

OFI 02 – Ensure current QEHS Policy is posted in the warehouse.

OFI 03 – Consider filling in the category for the type of Risks and Opportunities identified in the matrix. (Ex. Quality, Environmental, Health and Safety)

OFI 04 – Consider documenting required permits and licenses on the compliance obligation summary lists. (Ex. Business Licenses, Reseller Permit, Certificate of Boiler, Fire Permits)

OFI 05 – Consider Completing the Risk Assessment form or editing the 6.1.1.1 Risk Assessment Procedure to only conduct the Risk Assessment for when going for e-Stewards certification.

OFI 06 – Ensure emergency drills are recorded on the proper form: 8.2.4 Emergency Drill Record.

OFI 07 – Ensure current Emergency Contact Lists are posted.

**EcoLights Facility
RIOS Internal Audit Schedule
July 7th, 2023**

July 7th, 2023	
Time	Processes to be Audited
7:00am	Arrive on-site
7:15am – 7:30am	Opening Meeting
7:30am – 12:00pm	Site Tour – review of processes in scope of certification RIOS 1.1 Scope and Application
	QEH&S Infrastructure and Policy RIOS 1.2.1 Management Structure RIOS 1.2.2 Resources RIOS 1.2.3 Senior Management RIOS 2.0 Policy
	Receiving RIOS 3.1 Footprint, 4.4 Quality Controls, 4.5 Environmental Controls, 4.6 Health and Safety Controls, 4.7 Emergency Preparedness, 5.1 Monitoring and Measurement
12:00pm – 12:30pm	Lunch – on-site preferred
12:30pm – 1:30pm	Sorting RIOS 3.1 Footprint, 4.4 Quality Controls, 4.5 Environmental Controls, 4.6 Health and Safety Controls, 4.7 Emergency Preparedness, 5.1 Monitoring and Measurement
	Dismantling RIOS 3.1 Footprint, 4.4 Quality Controls, 4.5 Environmental Controls, 4.6 Health and Safety Controls, 4.7 Emergency Preparedness, 5.1 Monitoring and Measurement
	Shredding RIOS 3.1 Footprint, 4.4 Quality Controls, 4.5 Environmental Controls, 4.6 Health and Safety Controls, 4.7 Emergency Preparedness, 5.1 Monitoring and Measurement
1:30pm – 2:30pm	Identifying the RIOS Footprint RIOS 3.1 Identifying the RIOS Footprint
	Document and Recordkeeping Controls RIOS 1.3 Document and Recordkeeping Controls
	Improvement Planning RIOS 3.2 Improvement Planning
	Change Management RIOS 3.3 Change Management
	Training and Communication RIOS 4.1 Recycler Knowledge RIOS 4.2 Communication
	Operational Control RIOS 4.3.1 Source Material RIOS 4.3.2 Outsourced Providers, Products and Services
	Nonconformance and Corrective Action RIOS 5.2 Nonconformance and Corrective Action
	Management Review

	RIOS 6.0 Management Review
2:30pm – 3:00pm	Closing Meeting

Completed off-site	Internal Audit Process RIOS 5.3 Internal RIOS Audits
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GREENEYE
PARTNERS™

Certificate of Completion

This is to certify that

Tom Delich

**has successfully completed the RIOS
Internal Auditor Training Course**

Nicole Delich

Nicole Delich, Partner

October 7th 2020

Date of Issue

RIOS:2016™ Auditor Training Course

Nicole Delich

Auditor

12850 Dory Ave
Apple Valley, MN 55124

Location

HAS COMPLETED AND SUCCESSFULLY PASSED THE RIOS:2016™ AUDITOR TRAINING
COURSE EXAM. ATTEST:



Darrell Kendall
RIOS Executive Director



Jeremy Miller
Global Recycling Standards Organization
Corporation Board Chair

Appendix F: WAC 173-910-430 (2) Analysis



LightRecycle Washington
WAC 173-910-430 (2) Analysis

For submission to:

Washington State Department of Ecology
Solid Waste Management Program
Attn: Megan Warfield

Submitted by:

PCA Product Stewardship Inc.
P.O. Box 30811
Seattle, WA 98103

Introduction

The Washington (WA) State Mercury-Containing Lights Product Stewardship Program, called LightRecycle Washington (the “Program” or “LRW”), began on January 1, 2015, for the collection and recycling of mercury-containing lights sold at retail. Pursuant to WAC 173-910-430, each stewardship organization must submit an annual report to the department describing the results of implementing the stewardship organization's plan for the prior calendar year. In addition, WAC 173-910-430(2) states that starting in 2023, the Program is required to provide an analysis that includes:

- The percent of total sales of lights sold at retail to covered entities in Washington that mercury-containing lights constitute,
- The estimated number of mercury-containing lights in use by covered entities in the state,
- The projected number of unwanted mercury-containing lights to be recycled in future years.

In agreement with the Department of Ecology, the Program agreed to submit these updated reporting requirements.

This report shows the results and compliance with the specified requirements and provides a comprehensive overview of the findings using data as reported in the 2023 annual report.

Requirements: [WAC 173-910-430 \(2\)](#)

WAC173-910-430(2) mandates that, starting in 2023, stewardship organizations are required to include an analysis in their annual reports of the percent of total sales of lights sold at retail to covered entities in Washington that mercury-containing lights constitute, the estimated number of mercury-containing lights in use by covered entities in the state, and the projected number of unwanted mercury-containing lights to be recycled in future years. To facilitate this analysis, the Program has structured the requirements into three key elements:

1. The percent of total sales of lights sold at retail to covered entities in Washington that mercury-containing lights constitute,
2. The estimated number of mercury-containing lights in use by covered entities in the state,
3. The projected number of unwanted mercury-containing lights to be recycled in future years.

RCW 70A.505.020 (3) defines "Covered entities" as:

- a) A ***household generator*** or other person who purchases mercury-containing lights at retail and delivers no more than ten mercury-containing lights to registered collectors for a product stewardship program on any given day; and
- b) A ***household generator*** or other person who purchases mercury-containing lights at retail and utilizes a registered residential curbside collection program or a mail-back program for collection of mercury-containing lights and discards no more than fifteen mercury-containing lights into those programs on any given day.

The ensuing sections provide the outcomes of the analysis done for each of the required elements.

Analysis 1 – The percent of total sales of lights sold at retail to covered entities in Washington that mercury-containing lights constitute.

Comprehensive data for light bulb sales in Washington State is currently unavailable. In the absence of state-specific sales figures, we employed an estimation method based on national data and population growth trends.

According to the US Energy Information Association, approximately 1.1 billion light bulbs were sold across the United States in 2020, encompassing all bulb types such as incandescent, fluorescent, LED, and more.

For our analysis, we derived the figure of 3.3 light bulbs sold per person in 2020 by dividing the total number of light bulbs sold nationally (1.1 billion) by the population of the United States (331,449,281). This calculation served as the basis for our estimation. We then applied this national average to the population of Washington State in 2020 (7,705,281), resulting in an estimate of approximately 26 million light bulbs sold within the state during the same year.

While this report uses the statistic of 3.3 light bulbs sold per person in 2020, it's important to note that lamp purchases from the ICI sector, typically made through electrical distributors, often involve significant quantities, ranging from tens to thousands of units. These large-scale purchases constitute a substantial portion of the overall purchases.

Table 1 illustrates this calculation, showcasing the population figures and the derived average of 3.3 light bulbs sold per person in 2020.

	Population (2020)	Total Light bulbs sold (2020)	Light bulbs sold per person (2020)
USA Total	331,449,281	1.1 billion	3.3
WA state only	7,705,281	25,427,427	3.3

Table 1: Comparison of National Sales Data and Estimated Washington State Sales Data for 2020

In terms of market share, the 2020 data from the US Energy Information Administration revealed three primary sectors for light sales in the USA: residential (13%), industrial (39%), and commercial (48%). The WA state regulation defines “Covered Entity” as a **household generator** or other person who purchases mercury-containing lights at retail. However, within the context of the LRW program, a notable consideration arises: a small portion of commercial sector sales could be attributed to retail channels, potentially classifying them as covered entities. Consequently, our analysis considers two distinct perspectives:

Firstly, for Method 1, it employs a broad range, spanning from 13% (representing residential households) to 61% (encompassing both household and the entire commercial sector).

Secondly, for Method 2, we have drawn insights from the industry and considered the current understanding of the sector. This perspective suggests that it is more relevant to emphasize that Covered Entities in Washington State primarily belong to the household sector, accounting for only the estimated 13%, with a relatively small representation in the commercial sector, which is no more than 10% of the total 48% attributed to commercial sales. Based on these insights, we can calculate that 10% of the 48% of commercial sales translates to 3% of the total sales. Using this information, we define a narrower focus and a more contextually meaningful approach for our second method, resulting in a range of 13-16%.

Based on this, LightRecycle Washington uses the results of Method 2, noting that Covered Entities, as defined in Washington State, are primarily individuals from households who recycle mercury-containing lamps with a "retail" origin. These lamps are traditionally sold through major national chain home improvement retailers, neighborhood hardware stores, grocery stores, and online retail platforms. These channels are chosen by consumers (i.e., the covered entities) due to their convenience, being located near other consumer retail establishments where household goods are purchased.

In contrast, commercial and industrial (ICI) lighting markets, serving commercial and industrial spaces, operate independently from household-focused lighting markets. ICI lighting sales predominantly occur through electrical distributors or direct transactions between manufacturers and end-users, with linear fluorescent lamps being the most common for ICI applications.

There are notable distinctions between electrical distributors and consumer retail outlets:

- Electrical distributors do not charge an Environmental Handling Charge and are thus out of the program's scope.
- Their customers include commercial and industrial property owners, developers, educational institutions, and medical facilities.
- Electrical distributors are typically located in areas less frequented by consumers for lamp purchases.
- Many electrical distributors exclusively sell to trade professionals and do not cater to covered entities seeking lamps for household use.
- Mercury-containing lamps for C&I applications are often shipped in bulk cartons, lacking individual packaging suitable for household transportation.

In summary, even though our analysis provides the two methods for the calculations of the results, we recommend using the results of the estimated sales of all types of light bulbs to Covered Entities in Washington State within the range of 13%-16% to account for the small portion of the commercial sector that can potentially be included as a covered entity.

WA Total bulbs sold	~26,000,000
Method 1: Covered entities represent the range 13% - 61% of the market share in WA State	
WA bulbs sold to covered entities	3,380,000 – 15,860,000 units sold to Covered Entities
Method 2: Covered entities represent 13% - 16% of the market share in WA State	
WA bulbs sold to covered entities	3,380,000 – 4,160,000 units sold to Covered Entities

Table 2: Total Sales of lights (bulbs) to Covered Entities (households + commercial) in 2020

The data used in this analysis is from 2020. To project sales for 2021, 2022, 2023, and 2024, we applied Compound Annual Growth Rate (CAGR) calculations. Market research, supported by industry insights, indicates an approximate 1.5% CAGR for the overall light sales market and about 5% for the residential market for the period from 2020 to 2026 (Source: Statistica and other sources). These studies and industry input took into account factors such as the impact of the COVID-19 pandemic, the transition to LED lighting, market saturation in mature markets, and current inflation when projecting the CAGR for light bulb sales in the coming years.

Considering the two methods and the actual sales of mercury-containing lights, we conducted calculations to determine the percentage of sales that mercury-containing lights represent in Washington State. The findings are presented in Table 4.

Analysis: Lights sold at retail to covered entities in Washington State (units)					
Using: 13% Residential Market Share					
	2020	2021	2022	2023	2024
Total Lights sold (CAGR 1.5%)	26,000,000	26,390,000	26,785,850	27,187,638	27,595,452
Sold to Covered Entities: Residential (13% market share)					
Household - All lights (CAGR 5%)	3,380,000	3,549,000	3,726,450	3,912,773	4,108,411
Mercury Containing Actual Lights sales	1,378,044	850,586	621,230	424,659	297,261
% of sales that Mercury Containing lights represent	41%	24%	17%	11%	7%
Method 1: Range 13% (residential) to 61% (13% residential + 48% commercial)					
	2020	2021	2022	2023	2024
Total Lights sold (CAGR 1.5%)	26,000,000	26,390,000	26,785,850	27,187,638	27,595,452
Sold to Covered Entities: Commercial (48% market share)					
Commercial (48%) - All lights (CAGR 1.5%)	12,480,000	12,667,200	12,857,208	13,050,066	13,245,817
Mercury Containing Actual Lights sales	1,378,044	850,586	621,230	424,659	297,261
% of sales that Mercury Containing lights represent using both residential+commercial (61%) market share	9%	5%	4%	3%	2%
% range of sales that mercury containing lights represent in Washington State	9-41%	5-24%	4-17%	3-11%	2-7%
Method 2: Range 13% (residential) to 16% (~10% of the 48% commercial)					
	2020	2021	2022	2023	2024
Total Lights sold (CAGR 1.5%)	26,000,000	26,390,000	26,785,850	27,187,638	27,595,452
Sold to Covered Entities: Commercial (3% market share)					
Commercial (3%) - All lights (CAGR 1.5%)	780,000	791,700	803,576	815,629	827,864
Mercury Containing Lights sales	1,378,044	893,751	621,230	424,659	297,261
% of sales that Mercury Containing lights represent using both residential+portion of commercial (16%) market share	33%	21%	14%	9%	6%
% range of sales that mercury containing lights represent in Washington State	33-41%	21-24%	14-17%	9-11%	6-7%

Table 4: Percent of sales that mercury containing lights represent in WA state

In conclusion, based on the data and calculations, and since mercury-containing lights represent only a small portion of the ICI lamps sold to covered entities, mercury-containing lights are estimated to constitute 6-7% of total sales of lights sold at retail to covered entities in Washington State as of 2024.

Analysis 2 – The estimated number of mercury-containing lights in use by covered entities in the state.

All mercury-containing lights that have been sold in Washington State can be categorized into four groups:

1. **In use** – Lights that are currently being used and are affected by the lifespan of the bulbs. According to the US EPA, mercury lights have a lifespan of 4-8 years. They are made of glass arc tubes and other delicate elements and are more prone to damage or shattering compared to LED lights.
2. **Recycled** – Lights that have already been captured by the LRW program.
3. **Spent (not recycled)** – lights that have reached the end of their useful life and have not been recycled. These lights may be landfilled, broken, or waiting to be recycled. It is estimated that 30-40% of used (spent) lights ultimately end up in landfills and are therefore categorized as "not recycled," as reported by the US EPA and the US Energy Information Administration.
4. **Stored** – Lights that are kept in storage and are yet to be used or sold.

To estimate the number of mercury-containing lights currently in use by covered entities in the state, we have employed two methods. The first method takes into account the product's lifespan and end-of-life management statistics, considering the four categories mentioned above. The second method utilizes household lightbulb usage data from the USA.

In this analysis, we will combine both methods to estimate the current number of mercury-containing lights in use by covered entities in Washington State.

Method 1 - Using Lifespan and End-of-Life Management Statistics

In this method, we aim to estimate the number of mercury-containing lights in use by covered entities in Washington State by considering the lifespan of the product and end-of-life management statistics. Mercury lights typically have a lifespan ranging from 4 to 8 years. During the initial years, a higher percentage of lights are in active use, reflecting their early purchase and installation. However, as these lights approach the end of their lifespan, which typically ranges from 4 to 8 years, there is a more noticeable decrease in the percentage in use. This decline becomes more pronounced in the fourth year (2021) and subsequent years as the lifespan of the bulbs becomes a determining factor.

To create a comprehensive distribution of how these lights behave over a period of 10 years, we have developed the following table that illustrates the percentage of lights sold versus the percentage in use over the specified years:

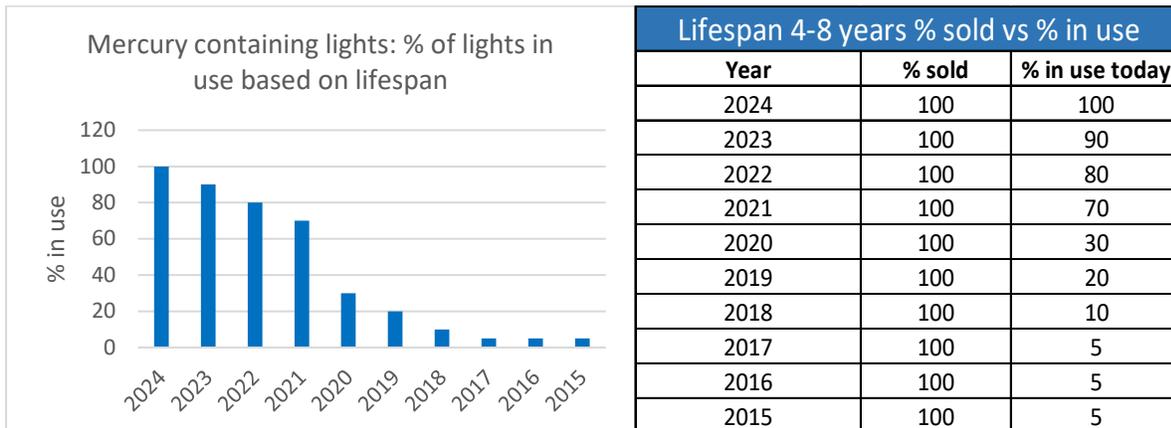


Table 5: Distribution of the lifespan of mercury-containing lights.

If we apply the lifespan distribution methodology to calculate similar distributions for the other 3 end of life categories (spent, stored, collected), we obtain a distribution figure (Figure 1) that portrays the destiny of each light sold, revealing the proportions that remain in use, are in storage, have been collected by the program and have not been recycled. This visual representation serves as a tool for understanding the factors influencing the calculation of the number of mercury-containing lights in use by Covered Entities in Washington state.

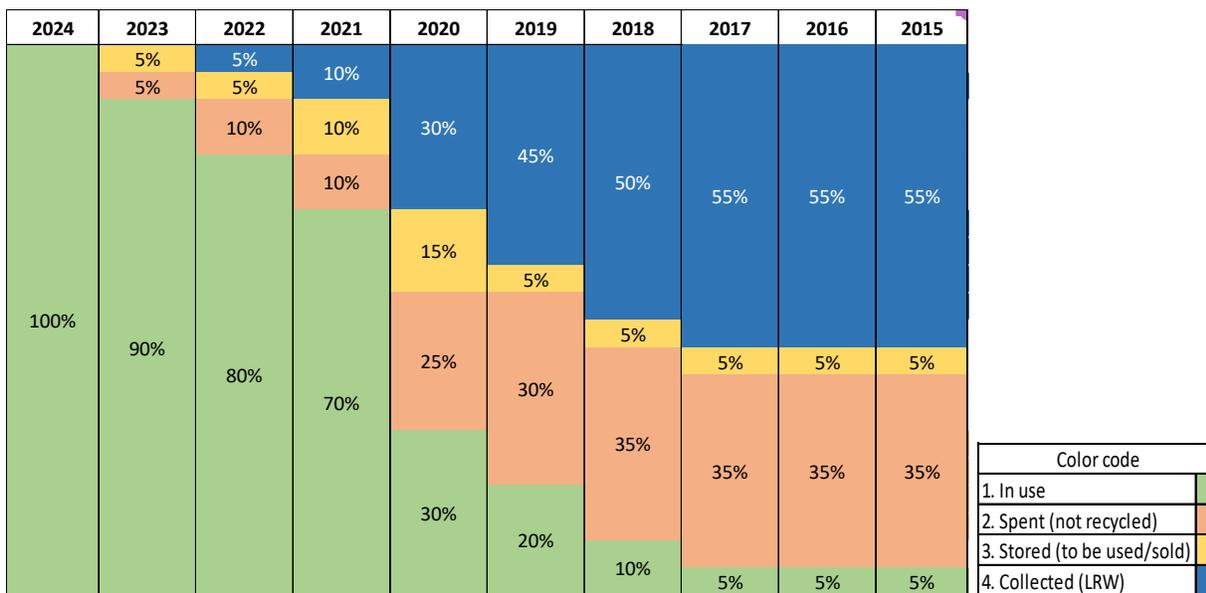


Figure 1: Distribution of status of mercury-containing lights sold in WA state.

To estimate the number of mercury-containing lights in use by Covered Entities in Washington State, we've considered several crucial factors, including sales and collections data spanning from 2015 to 2024 and the distribution of lifespan for these lights. By applying this distribution to actual sales figures over the period, we have arrived at our results, as illustrated in Table 6.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Sales	8,388,850	5,473,032	2,988,636	1,834,705	1,633,640	1,378,044	850,586	621,230	424,659	297,261	23,890,643
Collections	988,449	1,181,616	1,317,790	1,271,304	1,343,229	1,092,317	1,240,967	1,265,787	898,282	898,282	11,498,023
Difference	7,400,401	4,291,416	1,670,846	563,401	290,411	285,727	-390,381	-644,557	-473,623	-601,021	12,392,620
Lifespan distribution	5%	5%	5%	10%	20%	30%	70%	80%	90%	100%	
Estimated in use	419,443	273,652	149,432	183,471	326,728	413,413	595,410	496,984	382,193	297,261	3,537,986

Table 6. Estimated number of mercury-containing lights in use in WA State.

Based on the findings of this analysis (method 1), as of May 2024, an estimated 3,537,986 mercury-containing lights are currently in use by covered entities throughout Washington State.

Method 2 - Using Household Data and Usage Statistics

In the second approach, we utilize household lightbulb use data as provided by the US Energy Information Administration. Leveraging this information in conjunction with census data, we can extrapolate the number of lightbulbs in use within Washington State in 2020. The estimates generated from this method serve as a validation point, allowing us to cross-verify the findings derived from Method 1. This dual-method approach ensures results robustly quantify the number of lightbulbs currently in use in the state.

To arrive at our estimates, we begin by considering the household data provided by the US Energy Information Administration, which indicates that an average American household has approximately 40-50 lightbulbs in socket (as of 2020). This data serves as a direct representation of the number of lights currently in use by covered entities. We then combine this information with census data to derive estimates specifically for Washington State in 2020.

According to census data for 2020, there were a total of 129 million households in the United States. Applying the 40-50 lightbulbs per household figure to this data yields an estimated range of 5.1-6.4 billion lightbulbs actively in use across the USA.

Extending this calculation to Washington State, which had a population of approximately 7.739 million and a total of 2,937,000 households, we arrive at an estimated range of 117 to 146 million lightbulbs in use (all types) within the state. These estimations are presented in Table 7, providing a detailed breakdown of the number of lightbulbs in use based on household data from the US Energy Information Administration (EIA).

	Population	Number of Households	Average number of bulbs per household	Number of bulbs in use
US	331,000,000	129,000,000	40-50	5.160-6.450 billion
WA	7,739,000	2,937,000	40-50	117.48-146 million

Table 7: Estimated Number of Lightbulbs (all types) in Use in Washington State - Using Household Data (EIA) in 2020

The next step was to identify how many of the estimated 117-146 million lightbulbs in active use were, in fact, mercury-containing lights. To achieve this, historical data and behavioral trends related to lightbulb usage within households across the United States were explored.

Recent data reveals a significant shift in lightbulb preferences, with LED bulbs now the top choice among both residents and contractors. This changing preference has resulted in a reduced use of mercury-containing lightbulbs, as depicted in Figure 2. This shift, supported by industry insights, indicates a substantial transformation driven by economic and environmental considerations. Based on our forecast, considering this declining trend and industry insights, it is anticipated that by 2024, mercury lightbulbs will make up only about 2% of the total lighting in use throughout the United States.

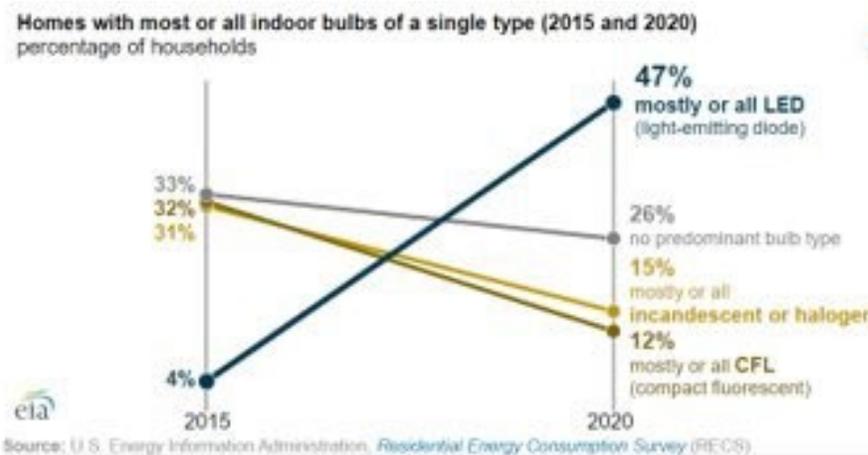


Figure 2: Trends in Lightbulb usage in USA by type of light.

The estimation for mercury-containing lightbulbs in use involved the incorporation of observed trends and household data.

To estimate the number of mercury-containing lights currently in use, we begin by examining sales and collections statistics, as outlined in Table 6. This data reveals that 23.9million lights were sold, and 11.5 million lights were collected by the program since 2015. Assuming that all lights that were sold and not collected are in use (100% working), we arrive at an estimate of 12.4 million mercury-containing lights currently in use by covered entities. This figure, when compared to the estimated range of 117-146 million lightbulbs in use (comprising all types of lights), represents approximately 8.5% of the total lights in circulation. This serves as the upper limit of our calculation, assuming all unsold lights are operational and in use.

However, taking into consideration the trend depicted in Figure 2 and insights from industry, it's expected that by 2024, the usage of mercury-containing lightbulbs will account for only a minimal percentage, specifically around 2% among all lights in use. When applying this 2%, it is **estimated that 2,920,000 mercury-containing lights are in use by covered entities in Washington State as of 2024.**

Calculation Method	Percentage of Mercury-Containing Lights in Use (Total: 117-146 million lightbulbs in use)	Number of Mercury-Containing Lights in Use
Upper Limit	8.5%	12,392,620
Trend-based	2.0%	2,920,000

Table 8: Estimation of Mercury containing lights in use.

Estimation of Mercury-Containing Lights in Use

The results from both Method 1 and Method 2 align closely, reinforcing the reliability of our findings.

As of 2024, there are an estimated 2.9 to 3.5 million mercury-containing lights in use by covered entities in Washington State

Analysis 3 – The projected number of unwanted mercury-containing lights to be recycled in future years

To perform this projection, we consider the four categories of how mercury-containing lights sold in Washington State can be classified as described before:

1. **Currently in use:** Estimated to be 2.9-3.5 million, averaging: 3.2 million bulbs in use.
2. **Recycled:** Lights that have already been captured by the LRW program, estimated to be 55% of all mercury containing lights sold.
3. **Spent (not recycled):** 30-40% of all lights will end up not being recycled.
4. **Stored:** Lights that are kept in storage and are yet to be used or sold.

Based on our previous analysis and available data, in 2024:

- Lights not collected 2015-2024: 12,392,620 (see table 6)
- Lights sold in 2024: 297,261 with a yearly minimum decreasing trend of 30% as seen based on data and industry insight.
- Lights currently in use: 3,200,000 an average of the estimated results in analysis 2.
- Estimated annual attrition (16.67% of lights in use): 533,440 for 2024
- Difference between not collected (~12.4 million) and in use (~3.2 million): 9,192,620
- Percentage to be recycled (55% of 9,192,620): 5,055,941
- Estimated units to be collected/recycled: 898,282 units from 2024 to 2028 since 2023 will serve as the reference point for collections.

The formula for Estimated Annual Attrition:

Estimated Annual Attrition = (Number of Lights in Use at the Beginning of the Year) x (Attrition Rate)

The attrition rate is calculated based on the assumption that mercury-containing lights have a typical lifespan of 4-8 years. To calculate an average attrition rate within this range:

- The lowest end of the lifespan range (4 years) corresponds to lights that have a 1/4 chance of failing each year (100% divided by 4 years).
- The highest end of the lifespan range (8 years) corresponds to lights that have a 1/8 chance of failing each year (100% divided by 8 years).

Taking the midpoint of this range (6 years) would yield an attrition rate of approximately 16.67% (100% divided by 6 years).

We use these assumptions based on research and industry feedback to derive our results. Table 9 illustrates the projected number of mercury-containing lights available for recycling in the upcoming years, considering factors such as sales trends, annual attrition rates, and recycling rates. The calculations consider the initial pool of lights still in use and not collected (column d), yearly sales, lights in use, and the attrition of lights reaching the end of their lifespan each year.

Year	Lights Sold	In Use (Beginning of Year) (a)	Spent based on attrition rate (16%) (b)	In Use (End of Year) (a-b)	To Be Recycled (55% of Spent (b))	To Be Collected/ Recycled per year (c)	To Be Recycled from All-time (d)	To Be Recycled (End of Year) (b+d-c)
2024	297,261	3,200,000	533,440	2,666,560	293392	898,282	5,055,941	4,451,051
2025	208,083	2,874,643	479,203	2,395,440	263562	898,282	4,451,051	3,816,331
2026	145,658	2,541,098	423,601	2,117,497	232981	898,282	3,816,331	3,151,029
2027	101,961	2,219,458	369,984	1,849,474	203491	898,282	3,151,029	2,456,238
2028	71,372	1,920,846	320,205	1,600,641	176113	898,282	2,456,238	1,734,069

Table 9: Projected Number of Unwanted Mercury-Containing Lights to be recycled at end of year (2024-2028)

Using the results of this analysis, we have found that the projected number of mercury-containing lights to be recycled in forthcoming years is summarized in Table 10 as follows:

Year	To Be Recycled from All-time
2024	5,055,941
2025	4,451,051
2026	3,816,331
2027	3,151,029
2028	2,456,238

Table 10: Projected Number of Unwanted Mercury-Containing Lights To Be Recycled (2024-2028)