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THERMOSTAT RECYCLING

Annual Report to the Director

2020 Calendar Year

BRITISH COLUMBIA

Submitted to:

Director, Extended Producer Responsibility Programs

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The Heating, Refrigeration
and Air Conditioning
Institute of Canada

Thermostat Recovery Program 2020 Report to Director, Waste Management

June 2021

This annual report is issued by the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) in accordance with the British Columbia Recycling Regulation (Reg. 449/2004). The 2020 annual report documents the Thermostat Recovery Program's activities and results in British Columbia from January 1 to December 31, 2020.

Any questions or comments about this report as well as the Thermostat Recovery Program operations should be directed to HRAI at:



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1. EXECUTIVE SUMMARY

Products within plan	Thermostats (electronic and mercury-containing)
Program website	www.hrai.ca/trp *

Reference		Summary (5-bullet maximum)
Recycling Reg. 449/2004	TRP Annual Report 2020	
Part 2, Section 8(2)(a)	3. Public Education Materials and Strategies	<ul style="list-style-type: none"> • Print ads and e-blasts with the Municipal Leader and HPAC magazines; ads in regional district recycling calendars • Outreach through HRAI's Weekly Newsletter • Collaborations through Stewardship Agencies of BC (SABC) • Recycling Council of British Columbia (RCBC) hotline and Recyclepedia
Part 2, Section 8(2)(b)	4. Collection System and Facilities	<ul style="list-style-type: none"> • 402 total collection points • 6 new collection points (4 of which are designated drop-off locations) • 1 main collection facility (1 was fully phased out by end of 2017) • Collection points in 27 regional districts
Part 2, Section 8(2)(c)	5. Product Environmental Impact Reduction, Reusability and Recyclability	<ul style="list-style-type: none"> • 2,972 mercury-containing vessels collected[†] • 2,753 electronic thermostats recycled • 205.74 kilograms of metals recycled • 226.51 kilograms of plastics collected, but not recycled due to global market changes (See Section 6 for details). • 0 new mercury-containing thermostats sold into the market
Part 2, Section 8(2)(d)	6. Pollution Prevention Hierarchy and Product / Component Management	<ul style="list-style-type: none"> • Recovered thermostats are not suitable for reuse • New thermostat designs do not contain mercury, and are more energy efficient than older mercury-containing models • Over 99% of metal components are recycled with a high degree of certainty • In 2020, approximately 51% of all collected materials were not recycled due to global market changes (See Section 6 for details).

* In 2016, HRAI took full management of Scout Environmental's *Switch the 'Stat* (S.T.S.) program, fully re-branding it and renaming it Thermostat Recovery Program (TRP), website found at www.hrai.com/trp.

[†] Although mercury-containing thermostats can contain anywhere between 1 and 4 switches, a study conducted by Veolia on behalf of the U.S.'s Thermostat Recycling Corporation found the average number of mercury switches per thermostat to be 1.4. This continues to be the industry standard weight conversion factor used to estimate mercury-containing vessels collected as all thermostats manufactured since 2008 have not included mercury components in their designs.

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Reference		Summary (5-bullet maximum)
Recycling Reg. 449/2004	TRP Annual Report 2020	
Part 2, Section 8(2)(e)	7. Product Sold and Collected and Recovery Rate[‡]	<ul style="list-style-type: none"> Collected 2,295 mercury containing thermostats, 2,367 electronic thermostats, and 219 loose mercury vessels Adjusted total: 2,451 mercury containing thermostats and 2,367 electronic thermostats, for a total of 4,818 collected (27.07% decrease from 2019 collection results)
Part 2, Section 8(2)(e.1)	9. Plan Performance	See 9.2 for breakdown per regional district
Part 2, Section 8(2)(f)	8. Summary of Deposits, Refunds, Revenues and Expenses	N/A

Comparison of Key Performance Targets			
Part 2 section 8(2)(g); See full list of targets in Plan Performance			
Performance Metric	Plan Targets [§]	2020 Performance	Strategies for Improvement
Mercury Thermostat Collection	4,153	2,451 (adjusted total) <i>59% of target</i>	<ul style="list-style-type: none"> Increase number of collection points**, especially those designated as public drop-off locations Improve communication with all participants to facilitate effective program marketing by all staff and raise awareness throughout BC.
Electronic Thermostat Collection	1,206	2,367 <i>96% over target</i>	<ul style="list-style-type: none"> Increase participant awareness on the collection of whole (intact) electronic thermostats, at the minimum including the electronic thermostat housing showing the brand

[‡]Thermostat Recovery Program does not report on Product Sold or Recovery Rate; see [Section 7](#) for details.

[§] Priority Stewardship Plan Targets are calculated based on the calendar year rather than the previously used program year in order to align it with the calendar year reporting. All targets outlined in this report used for mercury-thermostat collections and collection points are as agreed upon with Ministry file lead, and those for electronic thermostats are as proposed in the revised 2015-2020 five-year plan.

** See [Section 4](#) for descriptions of drop-off locations versus collection points

Comparison of Key Performance Targets			
Part 2 section 8(2)(g); See full list of targets in Plan Performance			
Performance Metric	Plan Targets [§]	2020 Performance	Strategies for Improvement
Collection Points	420	402 <i>96% of target</i>	<ul style="list-style-type: none"> • Increase outreach to wholesaler participants, particularly with multiple BC locations • Extend recruitment through improvements to the program’s marketing efforts and outreach to municipal channels and regions with poor coverage • Increase awareness & education with new technicians who will be responsible for old thermostat removal.

2. PROGRAM OUTLINE

The Thermostat Recovery Program (TRP) is the designated program for managing thermostats, both electromechanical (mercury-containing) and electronic models, in British Columbia. The British Columbia Stewardship Plan for Thermostats is the unofficially approved five year plan for recovering these products, and spans a timeline of July 1, 2015 to June 30, 2020.

- Electromechanical thermostats (also referred to as “mercury-containing thermostats”), which contain internal mercury switches (mercury in a sealed glass bulb) or snap switches to control the flow of electrical current; and
- Electronic thermostats (also referred to as “programmable thermostats”), which use sensors instead of switches to detect temperature levels and control the flow of electrical current.

Thermostat Recovery Program is funded by thermostat manufacturers who have sold thermostats into Canada and a complete list of manufacturers is available online at www.hrai.ca/trp. The program is fully administered by the Heating, Refrigeration, and Air Conditioning Institute of Canada (HRAI) on behalf of the manufacturers. Additionally, the program is supported by the Canadian Institute of Plumbing and Heating (CIPH).

In accordance with the program plan, the TRP collects thermostats in the province of British Columbia through one primary collection channel (HVAC contractors/wholesalers & municipal/regional district collection) and two secondary collection channels (drop-off locations and a send-back option). Based on estimates that 85 to 90% of thermostats sold in British Columbia are done through contractors and wholesalers in the HVAC industry, this group adopts the primary channel through which all types of thermostats are recovered.

In order to support this channel and increase program accessibility to the public, all participants have the option to register as a public drop-off location, an option often used by wholesalers, regional districts, and municipal depots. The TRP website offers an up-to-date public drop-off location lookup directory, searchable by postal code, listing all participating drop-off locations. Participants who register under the program’s “Send Back” option, which is often consumers in remote areas wanting to return a small collection of thermostats on a one-time basis, receive a small program collection pail and a pre-paid Purolator return waybill delivered to their location. Together, these channels comprise all of the programs participants, or collection points, as they shall be referred to throughout this report (see [Section 4](#) for term definitions).

As per the requirements under the British Columbia Recycling Regulation, this report has been prepared to summarize the program activities undertaken during the calendar year of 2020, and will be posted on the program website at www.hrai.ca/trp.

3. PUBLIC EDUCATION MATERIALS AND STRATEGIES

3.1. Initiatives

Thermostat Recovery Program operates by collecting thermostats through existing businesses and infrastructure, referred to in the program plan as “collection channels.” As described in [Section 2](#), the program uses one main collection channel (HVAC contractors/wholesalers) and two secondary collection channels (drop-off locations and send-back option) to recover mercury-containing and electronic thermostats.

In 2020, the program continued to build on the foundation laid in previous years, broadening the reach of the TRP. Key areas of focus in 2020 continued to be:

- Recruiting new registrations, particularly in the contractor/wholesaler channel
- Keeping participants engaged and informed through ongoing communication
- Spreading awareness on the TRP’s operation and how to participate through increased public outreach

To achieve these goals, the following initiatives were undertaken:

Initiative	Details	Audience/ Channel Reached	Type of Outreach
Ongoing outreach with HRAI national office	HRAI’s Spring and Fall review magazines, as well as several editions of the bi-weekly newsletter featured TRP program information and a call to register.	Contractors, Wholesalers	Industry outreach (print)
BC Stewards Stewardship Agencies of BC (SABC)	Formalized association of all BC stewardship associations, allowing stewards to present a united front and communicate collaboratively with various stakeholder groups <ul style="list-style-type: none"> • BC Recycles website provides an overview of each product stewardship organization (including TRP) • Recycling Handbook, provides an overview of each product stewardship organization (including TRP) • Action Plan developed by SABC to ensure the success of all programs, investigate potential gaps, and address feedback from BC Ministry of the Environment. 	General Public	Print media (Online)
Recycling Council of BC (RCBC)	Info about the program (materials accepted at nearest drop-off locations) made available to the public through a hotline, website and online tool (the Recyclepedia app). <ul style="list-style-type: none"> • 93 hotline inquiries 	BC Waste Management Industry General Public	Online & Phone

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	<ul style="list-style-type: none"> • 438 website searches • 189 app searches 		
Regional District Media	Regional District of Central Okanagan lists the TRP with a link on their Recycle Coach app and website. TRP ad and link to drop off locations included regional district calendars for the district of Central Okanagan and City of Penticton.	General Public	Print media (Online)
Industry Magazines	<ul style="list-style-type: none"> • Municipal Leader Magazine includes TRP ad in all four seasonal issues every year • TRP advertisements included in all seven issues of HPAC Magazine (with a readership of approximately 20,000) 	HVAC Industry General Public	Print media (Online)

In addition to the efforts listed above, the program is promoted through various voluntary channels. The outcomes of the program’s outreach initiatives will be used along with collection trends to inform future program performance targets. For examples of outreach initiatives, please refer to [Appendix A](#).

3.2. Resources

To support these initiatives, a variety of educational and marketing materials were used. These materials are described below.

1. **Program Website:** The program’s website www.hrai.ca/trp continues to be one of the primary educational tools, featuring content designed to educate contractors, wholesalers, and the general public. The site features a program overview, a description of mercury and its associated impacts, an online program registration form, and more. Other noteworthy features on the website are the Public Drop-off Locations lookup tool and an up-to-date cumulative collections counter that indicates the total thermostats and mercury vessels collected, as well as the weight of mercury recovered, in kilograms.
2. **Introduction letters:** As with previous years, new program registrants will receive a collection kit, including an outreach letter that outlines important program information. This letter helps new registrants develop commitment to the program and address program inquiries of their own.
3. **Posters:** Newly-registered participants designated as drop-off locations are automatically sent a poster upon registration. These colourful, eye-catching promotional posters are available to all participants for on-site display.
4. **Brochures:** Printed promotional brochures are automatically sent to new participants upon registration, based on their collection type, i.e. consumer-facing brochures for contractors and industry-facing brochures for wholesalers. These available at request for distribution to customers, and include facts about mercury and the Thermostat Recovery Program.
5. **E-Newsletter:** During the 2020 calendar year, an e-newsletter was sent to program participants every few months with a total of five being distributed. The newsletter included important program information, events and updates, and encouraged participants to continue their collection efforts.
6. **Collection sweeps:** In 2020 two collection sweeps were conducted, during which participants were asked to return their collection kit if it was at least half full. These collection sweeps occurred

in May and September and reached all Thermostat Recovery Program participants. The first sweep in May was conducted via electronic notice with reminder information as well as a link to a survey to process requests for materials. The survey included a field for participants to indicate that they were not sending back at the time as their collection pail was less than half full, as well as a field to indicate how many thermostats were in the pail. The final required field in the survey requests contact information for an additional point of contact with each participant. The September sweep was supported by a postcard sent out to all participants with reminder information as well as a “request for materials” form. The postcard included a field for participants to indicate if their collection pail was not at-least half-full and they were not sending back at the time, with a field to indicate how many thermostats are in their pail

4. COLLECTION SYSTEM AND FACILITIES

4.1. Collection System Overview

The Thermostat Recovery Program collection system is comprised of the following:

1. Collection points (program participants)
 - Comprised of the aforementioned 3 collection channels (details in [Section 4.1.2.](#))
 - Participants collect thermostats in program-provided pails before returning them to the collection facility
2. Collection facilities
 - As of 2018, Aevitas Inc. continues to be the program’s sole collection facility, receiving collections from all participants and processing the thermostats (count, dismantle)
3. Consolidation points
 - Historically, Tri-Arrow Industrial Recovery was contracted as a secondary consolidation point for the program; however, this has not been the case since 2016 (see section [4.1.1.](#) for details).
 - All vessels are shipped to a retort facility at least once a year (in 2020, vessels were shipped in November)
4. Retort facility
 - Final processing site of Hg vessels
 - Bethlehem Apparatus in PA, USA

The relationship between these facilities is demonstrated in the flow chart below^{††}:

^{††} Please note that plastics collected were not sent to down processors (step 7a) due to China’s global waste import ban ([See Section 6](#) for details), and no collected vessels were sent to Veolia Environmental for retort (Step 10).

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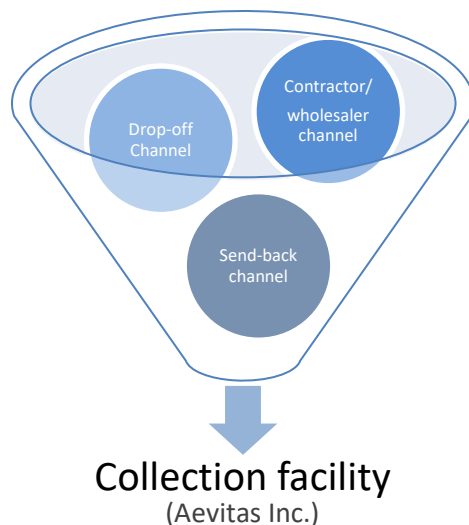
4.1.1. Collection Facilities

Although historically, the TRP used two collection facilities, in order to tighten up processes, including processor reporting and streamlining program operations, the program transitioned to using Aevitas Inc. (located in Ayr, ON) as the program's sole collection facility. Since 2018, TRP has not collected any program materials through Tri-Arrow Industrial Recovery (located in Surrey, BC), remaining true throughout 2020.

In 2020, Aevitas continued to act as the sole consolidation point for thermostat collections from BC, as well as Canada's single approved mercury retort facility ([Aevitas' website](#)). Upon receiving program collection pails directly from all collection points in BC, Aevitas begins processing the thermostats, keeping detailed monthly records of the pail contents and properties. These reports include the source company and contact, the total number of thermostats in each pail (including a breakdown by manufacturer), the number of mercury vessels, the weight of plastic and metal components, as well as any off-spec materials included in the containers.

4.1.2. Collection Points

The Thermostat Recovery Program uses three main collection channels: the contractor/wholesaler channel, public drop-off locations, and the send-back channel. Individual program participants in each of the channels are referred to as "collection points" or "participants". These participants play an integral role in the program's collection operations, accumulating end-of-life thermostats in TRP-provided collection containers until they are full, at which point they can use their pre-paid Purolator return waybill to return their thermostats to Aevitas Inc. This process is illustrated below:



As outlined in the stewardship plan, the program has a goal of 420 registered collection points by 2030^{**}. Through the outreach initiatives described above, 6 new businesses registered as collection points for end-of-life thermostats in 2020, 4 of which elected to act as drop-off locations.

The following table lists the collection points registered in 2020, indicating the type of business, whether they opted to be a drop-off location and the city where the business is located.

Company Name	Type	Drop Off?	City
Andrew Sheret Limited	Wholesaler	No	Vancouver
Andrew Sheret Ltd.	Wholesaler	No	Abbotsford
GFL Environmental Inc.	Recycling Center	Yes	Chemainus
GFL Environmental Inc.	Recycling Center	Yes	Duncan
Metro Testing & Engineering Ltd.	Contractor	Yes	Burnaby
Recycle-It Resource Recovery	Recycling Center	Yes	Fort St. John

4.2. Coverage in Regional Districts

In 2020, one collection point opted-out of the program, and one collection point relocated to a different regional district. Combining new participants with existing collection points as of December 31, 2020 there were 402 collection points in British Columbia.

The breakdown of collection points per regional district is as follows:

Region	Number of Collection Points
<i>Alberni–Clayoquot Regional District</i>	2
<i>Capital Regional District</i>	42
<i>Cariboo Regional District</i>	5
<i>Columbia–Shuswap Regional District</i>	19
<i>Comox Valley Regional District</i>	12
<i>Cowichan Valley Regional District</i>	12
<i>Fraser Valley Regional District</i>	36
<i>Metro Vancouver (Greater Vancouver Regional District)</i>	135
<i>Northern Rockies Regional District</i>	2

^{**} Targets are calculated based on the calendar year rather than the previously used program year in order to align it with the calendar year reporting. See explanation in [Section 9](#), below.

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<i>Peace River Regional District</i>	13
<i>Powell River Regional District</i>	3
<i>Regional District of Bulkley–Nechako</i>	6
<i>Regional District of Central Kootenay</i>	5
<i>Regional District of Central Okanagan</i>	17
<i>Regional District of East Kootenay</i>	7
<i>Regional District of Fraser – Fort George</i>	10
<i>Regional District of Kitimat–Stikine</i>	8
<i>Regional District of Kootenay Boundary</i>	5
<i>Regional District of Mount Waddington</i>	2
<i>Regional District of Nanaimo</i>	11
<i>Regional District of North Okanagan</i>	9
<i>Regional District of Okanagan–Similkameen</i>	10
<i>Skeena – Queen Charlotte Regional District</i>	3
<i>Squamish–Lillooet Regional District</i>	5
<i>Strathcona Regional District</i>	6
<i>Sunshine Coast Regional District</i>	7
<i>Thompson–Nicola Regional District</i>	10

As demonstrated in this table, TRP collection points are currently present in 27 of British Columbia’s 29 regions. The regions in which we do not yet have participants Central Coast Regional District and Stikine Region. Throughout 2021, we will continue to make efforts to register participants in the remaining 2 regional districts. Nonetheless, the TRP is accessible to all residents of the province of BC through the use of our free send-back channel, if they are unable to reach a registered collection point.

5. PRODUCT ENVIRONMENTAL IMPACT REDUCTION, REUSABILITY AND RECYCLABILITY

Historically, all components recovered through the Thermostat Recovery Program have been recycled, including the plastics, metals, glass, and any electronics associated with the thermostat. While plastics recovered through the program during the 2020 calendar year were not recycled, as per China’s global waste import band (see below for more details), all other components collected through the program were recycled as per the approved plan.

The breakdown of materials recovered, recycled, and not recycled from the province of British Columbia during 2020 included:

- 2,972 mercury-containing vessels (there can be anywhere between 1 to 4 mercury vessels contained in each thermostat)
- 2,367 electronic thermostats
- 7.43 kg of mercury (calculated based on 2.5 grams of Hg per vessel)
- 2.97 Kg of glass (calculated based on 1 gram of glass per vessel)
- 205.74 kg of metals
- 226.51 kg of plastics (not recycled)

The recyclability of mercury-containing thermostats cannot be improved, nor can the reusability of these obsolete products. New electronic programmable thermostats are more eco-conscious as they do not contain mercury and demonstrate higher energy efficiency than its mechanical predecessor. Furthermore, there are dangers associated with the reuse of mercury-containing thermostats due to incompatibility

with some new HVAC systems. For this reason, replacing and responsibly recycling older thermostats with newer electronic models continues to be the best practice to reduce environmental impacts in program operations.

TRP will continue investigating potential ways to divert our program's plastics from landfill and bring the program's material recyclability back above 99%. Other program materials, such as glass and metals, are recovered with a high level of certainty, therefore efforts to continually reduce environmental impacts within the scope of the program have centered on improving the program's collection processes. To avoid collecting non-thermostat materials through the program, stickers reading "Thermostats only" have been created to be placed on the outside of collection containers (as described in [Section 3](#)), and participants are routinely reminded to limit collections to thermostats and related materials.

Additional areas of opportunity identified to reduce environmental impacts are through the reuse and recycling of collection containers, as well as by eliminating unnecessary shipments through collection sweeps. Collection containers are cleaned and reused within the cycle of the program until they are no longer fit for the safe storage mercury products, at which point they are recycled. Air emissions are reduced the programs efforts to encourage participants to return pails only if they are at least half full during collection sweeps.

As the Thermostat Recovery Program extends and matures, additional practices to reduce environmental impacts will be explored to ensure the program delivers positive outcomes for the environment and British Columbia's citizens.

6. POLLUTION PREVENTION HIERARCHY AND PRODUCT / COMPONENT MANAGEMENT

As per the stewardship plan for thermostats, pollution prevention efforts have continued to focus on recycling, rather than reduction/redesign or reuse. The breakdown as to why recycling is the preferred management technique out of the four "Rs" is provided below.

Reduce/redesign: The main environmental concern with thermostats is the mercury contained in many older models. While many of these thermostats remain in use, the last known date of manufacture for these models in Canada is 2008 and they are no longer sold in Canada. New thermostats have been redesigned to eliminate the mercury component and improve energy efficiency.

Reuse: The plan does not encourage the reuse of old thermostats collected through this program for the following reasons:

- Our primary goal is to collect old mercury-containing thermostats and ensure that the mercury and other components are properly recovered and managed, not to see them in continued use.
- Old non-mercury-containing thermostats may not meet the technical/safety specifications of new HVAC systems and consume more energy than electronic programmable models.

Recycle: As per the program plan, the thermostats recovered from the Province of British Columbia are counted, documented, dismantled, and recycled. The thermostat components are recycled as follows:

- The metals collected are a mix of iron, nickel and aluminum, all holding high reuse/recycling value. Metals collected are consolidated with like materials at the collection facility and sent for down processing and resale.
- The glass vials containing the mercury are sent to Bethlehem Apparatus, where they are crushed, and the glass and mercury separated. The mercury is triple distilled and sent for resale/reuse in

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products and processes within the US market, or put into long-term storage depending on market demand. The glass is distilled and sent for recycling in fiberglass applications.

- The plastic components recovered through the program are deemed “e-waste plastics” and are comprised of mixed types. Until the end of 2017, when received by Aevitas Inc., our primary collection facility, the plastics were baled together and sent to be prepared for resale at one of the program's downstream recycling processors, either Durham Shred and Recycle or West Coast Plastics. Since the 2018 ban on imported global waste plastics in China, no substantial amount of plastics recovered through TRP were sent for recycling. This ban significantly limited the types of plastics accepted by recycling facilities, stripping e-waste plastics of economic viability. Therefore, until an appropriate alternative solution is made available, Aevitas, along with other waste processing facilities, have been disposing of collected e-plastics in landfill.

TRP will continue to participate in ongoing communications with recycling and waste processing facilities, as well as other stewardship organizations, in hopes to derive a joint solution to divert e-plastics from landfill. Investigations into potential solutions will consider all developments within the plastics market, along with any government developments directly affecting the current China plastics ban.

The following table describes the acceptable end fates for each of the components of a thermostat:

Component	Reuse	Recycle	Energy Recovery	Landfill	Other
Plastics	X	Preferred	X	X	See comments below
Metals	X	Preferred	X	X	N/A
Mercury Vessels (glass)	X	Preferred	X	X	N/A
Mercury Vessels (mercury)	Optional	X	X	X	See comments below

Greater than 99% of all collected metal and glass components are recyclable, and were managed in accordance with the program plan and principles of pollution prevention in 2020. Although collected plastic components were not recycled, solutions to rectify this issue are continually being pursued.

The US market demand determines the ratio of mercury put into long-term storage versus that sold for re-use. Since the 2014 mercury export ban in the US, recent years have seen large amounts of mercury being put into long-term storage. However due to a market economic turn-up, all mercury collected in 2020 was shipped to the US for retort in November, to be recycled and sold for re-use in the fluorescent product market.

The following table describes processing pathways and criteria used to assess product end fate by product component:

Nature of Processing	Component (% sold or transferred for processing)			Basis of evidence for product treatment
	Plastics	Metals	Mercury Vessels (incl. glass)	
Transfer to direct processor (BC or ON)	During 2020: 0%	>99%	0%	<ul style="list-style-type: none"> • Due diligence process for supplier selection (incl. detailed qualification of downstream suppliers by Aevitas) • Detailed contracts with collection facility
Transfer to direct processor elsewhere in North America	0%	0%	0%	

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Transfer to direct processor outside of North America	0%	0%	0%	<ul style="list-style-type: none"> • Monthly reporting from collection facility • Annual site visit to review processes at local collection facility (not during 2020) • Official shipping manifest with product weights • Certificate of Destruction/Recycling provided by retort facility
Multi-step processing (BC or ON)	0%	0%	0%	
Multi-step processing elsewhere in North America	0%	0%	100%	
Multi-step processing outside of North America	0%	0%	0%	

7. PRODUCT SOLD AND COLLECTED AND RECOVERY RATE

Mercury-containing thermostats are no longer sold into the Canadian market and with no sales to report, the amount of product sold is not currently tracked. With respect to newer programmable models, thermostat sales are neither tracked on a provincial, nor federal level, therefore insufficient data is available to report on the matter. Although thermostats can have a life-span of 20-30 years, renovations can reduce this lifespan by roughly 7-10 years. This further challenges the process of determining any correlation between product sold and recovered.

For the reasons stated above, the TRP does not use recovery rate as a metric for program performance, but rather measures the total amount of product collected against targets set in the approved program stewardship plan (see [Section 9](#)).

8. SUMMARY OF DEPOSITS, REFUNDS, REVENUES AND EXPENDITURES

As the Thermostat Recovery Program does not charge deposits, this section does not apply.

9. PLAN PERFORMANCE

The following table describes progress made towards the approved targets set out in the stewardship plan for the Thermostat Recovery Program:

	Performance Metric & Plan Target	2020 Results	2021 Strategies for Improvement
Performance Targets	1. Mercury Thermostat Collection: 4,153	- 2,451 <i>59% of target</i>	<ul style="list-style-type: none"> - Increase number of collection points, especially those designated as public drop-off locations - Improve communication with all participants to facilitate effective program marketing by all staff and raise awareness throughout BC.
	2. Electronic Thermostat Collection: 1,206	- 2,153 <i>196% of target</i>	<ul style="list-style-type: none"> - Increase participant awareness on the collection of whole (intact) electronic thermostats, at the minimum including the electronic thermostat housing showing the brand

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	3. Collection Points: 420	- 402 <i>96% of target</i>	<ul style="list-style-type: none"> - Increase outreach to wholesaler participants, particularly with multiple BC locations - Extend recruitment through improvements to the program's marketing efforts and outreach to municipal channels and regions with poor coverage - Increase awareness & education with new technicians who will be responsible for old thermostat removal.
Communication Targets	4. Program Website: Monthly updates	<ul style="list-style-type: none"> - 671 unique website visits from BC - Updates in real-time with new registrations 	<ul style="list-style-type: none"> - Continue to explore potential opportunities to promote the website through partnerships and advertisements - Continue updating collection figures monthly and conducting quarterly reviews and updates ensuring information accuracy
	5. Printed Brochures: Min. 500 printed brochures distributed	- Approx. 400 brochures distributed	<ul style="list-style-type: none"> - Explore opportunities to increase public outreach and brochure distribution - With the ongoing effects of the COVID-19 pandemic, the program will continue to favour the distribution of electronic marketing and communication materials
	6. Printed Posters: Distributed to all new drop-off locations	- 44 posters distributed to drop-off locations	- Increase program outreach and awareness to recruit new drop-off locations and encourage existing locations to designate themselves as such
	7. Industry-Facing Advertising: Minimum of 5 ads	- Print ads in all 7 issues of HPAC magazine	<ul style="list-style-type: none"> - Continue advertising with HPAC (Heating, Plumbing and Air Conditioning) magazine, an industry publication with a readership of approximately 20,000 - Explore other opportunities for industry-facing advertising

9.1. Progress toward Collection Targets

The following table provides further information regarding the amount of product collected by the Thermostat Recovery Program during the period of January 1 to December 31, 2020, measured against the targets outlined in the official stewardship plan, as well as the program growth as compared to the same period in 2019.

Collection of Thermostats: Progress Against Targets and Program Growth					
Thermostat Type	Targets (2020)	Product Collected		Percent Change from 2019	Progress to Target
		2020	2019		
Mercury-Containing	4,153	Adjusted total: 2,451	Adjusted total: 4,453	-45%	59% to target
	-	Intact units: 2,295	Intact units: 3,187	-28%	-
		Loose vessels: 219	Loose vessels: 1,772	-88%	

Thermostat Recovery Program 2020 Report to Director, Waste Management

Electronic	1,206	2,367	2,153	+10%	96% above target
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All participants are instructed to return only intact thermostats, however loose mercury vessels are occasionally returned as well. Using the industry-accepted standard of 1.4 switches per thermostat, the number of loose switches returned in 2020 is equivalent to roughly 156 thermostats. The adjusted total number of thermostats collected in 2020 is then 2,451. Continued efforts will be made in 2021 to increase program awareness and education to ensure participants understand and follow program instructions.

Although the TRP is a program dedicated to continuous improvement, it is acknowledged that the program's mercury-containing thermostat collection results in 2020 have decreased in comparison to the previous reporting year. These results can be attributed to the shift in the market toward programmable thermostats serving as the standard, while the number of mercury-containing thermostats available for collection continues to diminish. On the other hand, the program has seen a positive trend in collected electronic thermostats, meeting expected industry market trends.

As the industry continues to navigate the rapidly-evolving global crisis, new outreach approaches will be explored to enhance current efforts with existing participants and industry members, while expanding the program's reach. In addition, the development of more current future program collection targets are underway. We are hopeful that the program will yield successful outcomes in 2021.

9.2. Amount Collected by Regional District

The following table demonstrates the number of thermostats collected in each regional district in 2020.

Region	Mercury	Electronic Thermostats	Loose Vessels
<i>Capital Regional District</i>	149	652	13
<i>Cariboo Regional District</i>	59	0	0
<i>Comox Valley Regional District</i>	45	67	0
<i>Cowichan Valley Regional District</i>	75	172	0
<i>Fraser Valley Regional District</i>	283	103	84
<i>Metro Vancouver (Greater Vancouver Regional District)</i>	1031	1187	66
<i>Peace River Regional District</i>	9	17	0
<i>Powell River Regional District</i>	31	20	0
<i>Regional District of Central Okanagan</i>	208	22	5
<i>Regional District of East Kootenay</i>	157	0	22
<i>Regional District of Nanaimo</i>	29	0	0
<i>Sunshine Coast Regional District</i>	49	65	0
<i>Thompson Nicola Regional District</i>	97	3	0
<i>Columbia Shuswap Regional District</i>	2	11	0
<i>Regional District of Fraser Fort George</i>	43	10	26
<i>Regional District of Okanagan Similkameen</i>	28	38	3
TOTAL	2,295	2,367	219

APPENDIX A – EARNED MEDIA

RCBC Recyclepedia



What are you recycling?

Mercury-containing Thermostats

Where are you recycling?

Grinrod x ▾

Find Locations

Found 2 locations near Grinrod

▾ Mercury-containing Thermostat

Electromechanical (mercury-containing) and electronic thermostats are collected through the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI)'s province-wide Thermostat Recovery Program (TRP). They are accepted free-of-charge at TRP depots provided that they are fully intact.

For areas without a permanent drop-off depot, a free mail-in option exists. For additional information on the program and to locate the nearest drop-off depot, please visit [HRAI website](#) or call the [RCBC Recycling Hotline](#).



HRAI's Thermostat Recovery Program (TRP)

▸ See what other materials this depot also accepts

Phone: (800) 267-2231

Address: Province-wide


Website: <http://www.hrai.ca/program-participants>

Hours: Varies by location. See website.

Notes: Residents can drop off intact household thermostats to various locations throughout the province. Please log onto the website to find your closest location. A mail in option is available for more remote areas. Call for details.

City of Penticton Collection Calendar 2020 Ad

B.C. Product Stewardship Programs 2020-2021

PRODUCT	STEWARD	PROGRAM	For more details and depot locations
<p>Paint and Household Hazardous Waste</p> 		<p>Recycle leftover household paint, empty paint cans, and household hazardous waste including flammable liquids, pesticides, and gasoline at several locations in the province. Please ensure products are in their original containers, with intact labels and a tight seal.</p>	<p>Visit www.productcare.org for a full list of accepted products and recycling locations, or call 1-877-592-2972. Or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
<p>Medications</p> 		<p>Return unused and expired prescription medications, over-the-counter drugs and natural health products through the British Columbia Medications Return Program (BCMRP) to your nearest pharmacy.</p>	<p>www.healthsteward.ca or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
<p>Small Appliances and Power Tools</p> 		<p>Recycle over 400 types of small appliances and power tools including kitchen countertop, personal care, floor cleaning, and air treatment items. All appliances must be powered by electricity or batteries.</p>	<p>www.ElectroRecycle.ca or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
<p>Lights, Bulbs and Fixtures</p> 		<p>Recycle your light bulbs and light fixtures at hundreds of recycling locations in the province. Common accepted products include CFLs, LEDs, fluorescent tubes, and fixtures like lamps, flashlights, string lights, chandeliers, and more.</p>	<p>Visit www.productcare.org for a full list of accepted products and recycling locations, or call 1-877-592-2972. Or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
<p>Batteries and Cellphones</p> 		<p>Bring your household single-use and rechargeable batteries and cellphones for safe recycling and disposal. Includes cell phones and batteries under 5kg (alkaline, NiCd, lithium, etc); batteries from cell- and cordless phones, power tools, laptops, etc. Excludes car batteries.</p>	<p>www.call2recycle.ca/british-columbia or 1-888-224-9764.</p>
<p>Smoke or Carbon Monoxide Alarms</p> 		<p>Bring your smoke or carbon monoxide alarms to your nearest recycling location for safe recycling.</p>	<p>Visit www.productcare.org for a full list of accepted products and recycling locations, or call 1-877-592-2972. Or call the Recycling Council of B.C. Hotline at 1-800-667-4321.</p>
<p>Thermostats</p> 		<p>Bring your thermostat in for safe recycling and disposal to keep all its components, especially mercury, out of the waste stream. Includes all mercury-containing, electronic and mechanical thermostats.</p>	<p>www.hrai.ca/trp</p>
<p>Major Appliances</p> 		<p>Recycle major appliances at a collection site near you. Products include fridges, ovens, dishwashers, washers/dryers, range hoods, and more. Collected appliances will have refrigerant removed responsibly prior to recycling. Find a free certified collection site and a full list of accepted products at www.return-it.ca/large-appliances</p>	<p>For more details and depot locations: www.return-it.ca/large-appliances/locations or 1-888-252-4621</p>

Regional District of Central Okanagan – Recycle Coach



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What We Do

The Regional Waste Reduction Office provides information on recycling, garbage and yard waste collection and many programs to help your family or business reduce waste. You can reach us Monday to Friday from 8:00 am until 4:00 pm by email recycle@rdco.com or 250-469-6250.

For missed collection, damaged or missing carts, please contact Environmental 360 Solutions (E360S) at 250-868-3211.

For up to date collection schedule information and a what goes where search tool use the Plug in below or download the FREE and easy to use [Recycle Coach App](#) for your smart phone or tablet.

Regional Garbage & Recycling

Thermostats

Thermostats

Thermostat Recovery Program



The Thermostat Recovery Program (TRP) only accepts electronic, mechanical or mercury-containing end-of-life thermostats used to control heating and cooling systems. They prefer to receive these devices intact. Refer to the Drop-off Locations link below to find drop-off locations in your area. There is no fee for disposal. For more program information visit www.hra1.ca/trp.

The TRP DOES NOT accept other devices such as thermometers or barometers. Non-functional devices can be disposed of in the garbage if they do not contain mercury. For example, a thermometer containing red liquid is safe to dispose of. If a device contains a silver liquid then it should be taken to a Household Hazardous Waste Depot.

Drop off Locations

[Privacy Policy and Terms of Use](#)

Powered by [Recycle Coach](#)

Municipal Leader Magazine Spring 2020 Ad



COVID-19

A Message from the Minister

The Honourable Rochelle Squires, Minister of Municipal Relations

We are living through unprecedented circumstances, but there is one thing I can say with certainty and complete confidence: as Manitobans, we are known for the way we join together to help each other in the face of adversity. Banding together – even if we must physically maintain our distance – is exactly how Manitoba will get through this.

Knowing that this a rapidly-evolving situation, it is critical that we keep our lines of communication open. It is also critical that, in times of uncertainty, we look to credible sources for the latest information to keep our families and our communities safe. One of the best places to find accurate, up-to-date Manitoba-specific information is on the Manitoba government website at www.manitoba.ca. Please refer to this website regularly as information is changing at a rapid pace. An important link is the COVID-19 Screening Tool, which can be

found at <https://sharedhealthmb.ca/covid19/screening-tool>. If you are experiencing symptoms, this self-assessment tool will help determine if you should contact Health Links-Info Santé (204-788-8200 or toll free at 1-888-315-9257) or seek other medical advice.

It is also important, during these difficult circumstances, that we maintain contact with Manitobans who have elected us to lead. Manitoba Municipal Relations has distributed information to municipalities regarding public meetings and the need to be transparent while maintaining new social distancing recommendations. This information included the following social distancing alternatives to consider in your daily practices:

- Using adequate spacing for people assembled in meeting rooms and following sanitation and precautionary measures as outlined in the latest

guidelines from Manitoba Health, Seniors and Active Living (<https://manitoba.ca/covid19>)

- Limiting the use of municipal spaces to essential business purposes only
- Promoting alternative forms of access to information

Your leadership and cooperation is vital in our collective effort to protect the health and safety of all Manitobans. Should you have any questions or require further information related to municipal governance issues, please contact a Municipal Services Officer at 204-945-2572 or by email at mrmca@gov.mb.ca.

Thank you for the opportunity to share this important information. We are all in this together. Let's take care of one another, and please be sure to check in with your extended family, friends, and neighbours. 🌱

EASY. SAFE. FREE.
THERMOSTAT RECYCLING

We recycle all elements of the thermostat; plastic, metal, electronics and mercury (which is particularly hazardous).

Do your part and join the more than 1600 active participants in the program.

FOR MORE INFORMATION
www.hrai.ca/trp
1(800) 267-2231, x 224

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Spring 2020 | Municipal LEADER 11

HPAC Magazine March 2020 Ad



1 IBC Technologies' largest high efficiency space heating boiler: the EX SERIES has two models; EX700, EX 800. The series comes with a touchscreen interface with express setup, remote monitoring and diagnostics, native BACnet, 10:1 turn-down ratio, built-in 4 zone pump control and multi-boiler communication. www.ibcboiler.com



2 Weil-McLain's SVF Commercial Condensing Fire-Tube Boiler features a 316L stainless steel heat exchanger and efficiencies up to 97.1%. Available in six sizes between 750 and 3,000 MBH and fueled with NG or LP. The Unity control system offers programming and an eight boiler sequencer among other features. www.weilmclain.ca



3 Canarm HVAC introduces the FANBOS. The fan blankets a very large area moving air to create an expansive comfort zone. The large ceiling fan features six lightweight aluminum airfoils contoured for maximum air movement. During the heating season, it can destratify uneven temperatures in excess of 15 degrees from ceiling to floor. www.canarm.com/fanbos

PRE-SENTED BY
THERMOSTAT RECOVERY PROGRAM

The Thermostat Recovery Program (TRP) is a nationwide stewardship program focused on recovering and recycling thermostats that are no longer in use. We accept mercury-containing, electronic and mechanical HVAC thermostats and ensure that all components, such as the plastics, metals and especially the mercury are kept out of the waste stream.

If you're an HVAC industry contractor or wholesaler and you would like a safe, easy and free way to responsibly dispose of your decommissioned thermostats, find out how to register and participate today by visiting www.hrai.ca/trp or by contacting Nazick Yassien at HRAI via email: trp@hrai.ca or calling 1-800-267-2231, ext. 224.

www.hrai.ca/trp

CMPX #N15

EASY. SAFE. FREE.
THERMOSTAT RECYCLING

We recycle all elements of the thermostat; plastic, metal, electronics and mercury (which is particularly hazardous).

➔ Do your part and join the more than 1,500 contractors already participating in the program.

FOR MORE INFORMATION
www.hrai.ca/trp
1(800) 267-2231, x 224

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APPENDIX B – THIRD PARTY ASSURANCE



Independent practitioner’s reasonable assurance report on Heating, Refrigeration and Air Conditioning Institution Annual Report to the Director of Extended Producer Responsibility Programs at the Ministry of the Environment, Government of British Columbia as at December 31, 2020.

To the Directors of Heating, Refrigeration and Air Conditioning Institution

We have undertaken a reasonable assurance engagement on the following information (the “subject matter”) of Heating, Refrigeration and Air Conditioning Institution (HRAI), as detailed in Appendix A and presented in the 2020 Annual Report to the Director of Extended Producer Responsibility Programs at the Ministry of Environment, Government of British Columbia (“MOE”) as hosted on the HRAI website¹ as at December 31, 2020:

- the location of collection facilities and any changes in the number and location of collection facilities from the prior year in accordance with Section 8(2)(b) of the British Columbia Regulation 449/2004 Recycling Regulation (the “Recycling Regulation”);
- the description of how recovered product was managed in accordance with the pollution prevention hierarchy in accordance with Section 8(2)(d) of the Recycling Regulation;
- the total amount of the producers’ product collected for the period from January 1 to December 31, 2020 in accordance with Section 8(2)(e) of the Recycling Regulation; and
- the performance for the year in relation to targets in the approved stewardship plan under Section 8(2)(b), (d) and (e) in accordance with Section 8(2)(g) of the Recycling Regulation.

Management’s responsibility

Management is responsible for preparation of the subject matter in accordance with sections 8(2)(b), 8(2)(d) and 8(2)(e) established in the British Columbia Regulation 449/2004 Recycling Regulation, and the interpretation of the criteria as set out in Exhibit A (together, the criteria). Management is also responsible for such internal control as management determines necessary to enable the preparation of the subject matter that is free from material misstatement.

Our responsibility

Our responsibility is to express a reasonable assurance opinion on the subject matter based on the evidence we have obtained. We conducted our reasonable assurance engagement in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3000, *Attestation Engagements Other than Audit or Reviews of Historical Financial Information*.

This standard requires that we plan and perform this engagement to obtain reasonable assurance about whether the subject matter is free from material misstatement.

¹ The maintenance and integrity of the HRAI’s website is the responsibility of HRAI; the work carried out by PricewaterhouseCoopers LLP does not involve consideration of these matters and, accordingly, PricewaterhouseCoopers LLP accepts no responsibility for any changes that may have occurred to the reported information or criteria since they were posted on the website.

PricewaterhouseCoopers LLP
PwC Tower, 18 York Street, Suite 2600, Toronto, Ontario, Canada M5J 0B2
T: +1 416 863 1133, F: +1 416 365 8215, www.pwc.com/ca

“PwC” refers to PricewaterhouseCoopers LLP, an Ontario limited liability partnership.



Reasonable assurance is a high level of assurance, but is not a guarantee that an engagement conducted in accordance with this standard will always detect a material misstatement when it exists. The nature, timing and extent of procedures selected depends on our professional judgment, including an assessment of the risks of material misstatements, whether due to fraud or error, and involves examining evidence about management's preparation of the subject matter in accordance with the criteria.

Our reasonable assurance procedures included, but were not limited to the following:

- Making enquiries of management and senior executives to obtain an understanding of the overall governance and internal control environment and risk management processes relevant to the management and reporting of HRAI's Annual Report to the Director;
- Analytical reviews and trend analysis of reported data in relation to sections 8(2)(b), 8(2)(d) and 8(2)(e);
- Testing the processes, documents and underlying data on a sample basis;
- Recalculating quantitative data on a sample basis as it pertains to the subject matter information; and
- Evaluating the presentation and disclosure of the subject matter information in the Annual Report to the Director.

We believe the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our independence and quality control

We have complied with the relevant rules of professional conduct/code of ethics applicable to the practice of public accounting and related to assurance engagements, issued by various professional accounting bodies, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

The firm applies Canadian Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements* and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Opinion

In our opinion, Heating, Refrigeration and Air Conditioning Institution's subject matter information as at December 31, 2020 has been prepared, in all material respects, in accordance with the criteria.

Emphasis of matter

Without modifying our opinion, we draw your attention to Exhibit B, which describes why certain items required by the Assurance Requirements have been excluded. Our opinion is not modified in respect of this matter.



Purpose of statement and restriction on use of our report

The subject matter has been prepared to report to assist Heating, Refrigeration and Air Conditioning Institution meet the requirements of the British Columbia Regulation 449/2004 Recycling Regulation. As a result, the subject matter may not be suitable for another purpose.

PricewaterhouseCoopers LLP

Chartered Professional Accountants

Toronto, Ontario
June 15, 2021



Exhibit A

1. The location of collection facilities, and any changes in the number and location of collection facilities from the previous report as presented on page 4 and 11 of HRAI's 2020 Annual Report to the Director.

Result:

There is one main collection facility as at December 31st 2020.

Reference: Page 3 of HRAI's 2020 Annual Report to the Director.

Method of Reporting:

- Reporting Period: January 1st to December 31st, 2020.
- HRAI considers Aevitas Inc. to be the only Collection Facility. HRAI uses many Collection Points as partners in the collection of products. These are not considered collection facilities under the stewardship plan, and accordingly are not reported here.
- The number of Collection Facilities is reported on the basis of the number of Collection Facilities who have a signed contract with HRAI to collect, process, ship, and report on collected program products during the reporting period.
- The changes in number and location of Collection Facilities are calculated by tracking the additions and removals of Collection Facilities throughout a given reporting year. This information is further compared with the equivalent data from the end of the prior year.

Definitions:

- "Program Products" are all products included in the program as listed in the revised product stewardship plan 2015-2020, Section 2.4.
- "Collection Facilities" are considered to be locations with a signed contract with HRAI for the purpose of collecting, processing, shipping, and reporting on Program Products at any point during the reporting year.
- "Collection Points" are mechanisms for collection. This term was new to the program as of the 2012 reporting year. In prior years, the collection points were considered the collection facilities. Collection Points may include the following types of businesses (also known as 'participants') and have either signed a formal document or had a verbal discussion outlining their agreement with the Agency to take part in the program:
 - Contractors
 - Wholesalers
 - Local or regional government recycling centres or transfer stations
 - Direct send-back



2. The description of how recovered product was managed in accordance with the pollution prevention hierarchy in accordance with 8(2)(d) of the Recycling Regulation as presented on pages 3, 4, 11, 12, and 13 of HRAI’s 2020 Annual Report to the Director.

The descriptions of how components (i.e. plastic, metals, glass vials containing mercury) are processed, is presented in a list on pages 11-13 of the 2020 Annual Report for Aevitas Inc.

The acceptable end fates for each of the components of a thermostat, is presented within the table on page 13 of the 2020 Annual Report.

Component	Reuse	Recycle	Energy Recovery	Landfill	Other
Plastics	X	Preferred	X	X	See page 19
Metals	X	Preferred	X	X	NA
Mercury Vessels (glass)	X	Preferred	X	X	NA
Mercury Vessels (mercury)	Optional	X	X	X	See page 19

Reference: Pages 3, 4, 11, 12, and 13 of HRAI’s 2020 Annual Report to the Director.

Method of Reporting:

- Reporting Period: January 1st to December 31st, 2020.
- Program Products collected are reported by end of fate both by commodity and by process on the Pollution Prevention Hierarchy:
 - Reuse: N/A – No Program Products are reused per the revised product stewardship plan 2015-2020.
 - Recycle: Products are reported by each separately identifiable end of fate commodity (e.g. metals, glass, etc.) either based on the number of units for the mercury vessels; or based on weight in Kgs for the plastics, metals, mercury and glass:
 - The weight in kg of glass is calculated by multiplying the total number of mercury vessels by the industry standard of 1 gram of glass per vessel
 - The weight in kg of mercury is calculated by multiplying the total number of mercury vessels by the industry standard of 2.5 grams of mercury per vessel
 - Recovery: N/A - No Program Products are recovered.
- Waste: In 2020, the plastics generated from the TRP thermostats were disposed of into landfills.

Definitions:

- The Pollution Prevention Hierarchy includes the following:
- “Reuse” includes all Program Products that are refurbished or can be reused “as-is” through either, resale, return to inventory, or given away as a donation.



- “Recycle” includes:
 - Any Program Product that cannot be Reused.
 - Any Program Product where the sales agreement strictly prohibits the reuse of that product or requires its destruction.
 - Any Program Product that is harvested for parts.
 - Any commodities that are captured from the recycling process.

“Energy Recovery” relates to processing activities after the recycling stage and includes any element of the Program Product that is harvested to generate energy.

“Waste” includes any products not captured in the three streams above.

- “End of fate” is defined as final processed state of each commodity before entering a re-use stream or shipment to landfill / sequestration.

3. The total amount of the producer’s product sold and collected and the recovery rate as presented on pages 4, 14, and 15 of HRAI’s 2020 Annual Report to the Director.

Total amount of producer’s product collected in 2020 is:

- Collected 2,295 mercury containing thermostats, 2,367 electronic thermostats, and 219 loose mercury vessels
- Adjusted total: 2,451 mercury containing thermostats and 2,367 electronic thermostats, for a total of 4,818 collected

Adjusted total mercury containing thermostats are estimated as follows:

$$\begin{aligned} & \text{Intact mercury containing thermostats} + \text{Loose mercury vessels} \\ & \div \text{average mercury switches per vessel} = 2,295 + \frac{219}{1.4} = 2,451 \end{aligned}$$

Reference: Pages 4, 14, and 15 of HRAI’s 2020 Annual Report to the Director.

Method of Reporting:

- Reporting Period: January 1st to December 31st, 2020.
- Quantification of Product Collected is based on the number of Thermostats and Hg vessels reported by the Collection Facilities as having been received/collected and diverted during the reporting year.
- These amounts are monitored on a monthly basis through information collected that includes the number of thermostats and Hg vessels collected by geographic location.
- Although all participating collection points are encouraged to return only intact thermostats, loose vessels (which have been clipped out of thermostats) are occasionally returned as well. The equivalent number of thermostats is calculated by dividing the number of loose vessels by the industry-accepted standard of 1.4 vessels per thermostat (determined through averages provided



by the industry and confirmed during a pilot study conducted by the Agency in 2006).

- The “Adjusted total number of thermostats” collected is calculated by summing the total number of thermostats collected and the equivalent number of thermostats calculated above.

Definitions:

- "Program Products" are all products included in the program as listed in the revised product stewardship plan 2015-2020, Section 2.4.
- “Product Collected” is the amount of all Program Products collected from sources known to be located within the province of BC that occurred through the Collection Facilities. The amount of Product Collected is reported as the total number of thermostats, Adjusted total number of thermostats, total number of Mercury (“Hg”) vessels, and number of loose Hg vessels received by the Collection Facilities during the reporting year.

4. The performance for the year in relation to targets in the approved stewardship plan under Section 8(2)(b), (d) and (e) in accordance with Section 8(2)(g) of the Recycling Regulation as presented on pages 4, 14, and 15 of HRAI’s 2020 Annual Report to the Director.

Result:

The target number of thermostats to be collected in 2020 is 4,153 and the result is an adjusted total of 2,451 mercury thermostats. This is 59% of the target.

Reference: Pages 4, 14, and 15 of HRAI’s 2020 Annual Report to the Director.

Method of Reporting:

- Reporting period: January 1st to December 31st, 2020

Specific 2020 targets set out in the revised stewardship 2015-2020 are:

- i. Section 8(2)(b) - target is set for collection points, not collection facilities and therefore, no assurance provided.
- ii. Section 8(2)(d) - no target set for how the product is managed in accordance with the pollution prevention hierarchy because the Thermostat Recovery Program is already able to recycle greater than 99% of materials recovered through the program, efforts to continually reduce environmental impacts have centered on improving the program’s collection processes.
- iii. Section 8(2)(e) - no targets set for product sold (Product sold is not calculated or reported).
- iv. Section 8(2)(e) - 100% capture rate of the estimated number of mercury-containing thermostats available for collection (4,153), which equals a target of 4,153 thermostats to be collected.



Exhibit B

HRAI has not reported the recovery rate for the year in accordance with 8(2)(e) of the Recycling Regulations for the year ended December 31, 2020 as the approved stewardship plan does not outline the requirement to report recovery rates. If the stewardship program does not report a recovery rate in the approved plan, assurance for producers' product sold data is not required as outlined in the Assurance Requirements.