



2021 Annual Stewardship Report -British Columbia-

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Executive Summary

The manufacturers, distributors, and recyclers of lead batteries in British Columbia have had another successful year recovering just over 103% of the lead batteries sold in the province (Table 1). In total, there were just over 25Mkg of consumer and commercial lead batteries recovered and recycled at regulated smelters in Canada, USA and South Korea.

Approximately 99% of the lead is recovered in the smelting process and sold for a variety of purposes including the manufacture of new lead batteries. The sulphuric acid and plastic battery casings are recovered by the battery breaker and the acid and plastic casings are recycled into new batteries or manufactured into other products. The plastic separators within the battery cells are also recovered and used for energy recovery by the smelters.

A complete summary of the Targets and Key Performance Indicators for the lead battery program are summarized in Table 1. Some of the highlights of the program initiatives that support the recovery of lead batteries are summarized below.

In 2021, there were two waste characterization studies that analyzed 58 samples of residential and IC&I waste. The first study was in the Regional District of Central Okanagan and the second study was in the Regional District of Okanagan Similkameen. No lead batteries were found in any of the 2021 waste samples.

To date, the CBA has completed 13 studies with 625 individual samples of landfill waste. Based on the data, the calculated lead battery landfill diversion rate of 97.9% (Table 3). The high landfill diversion rate corroborates the high 2021 recovery rate for lead batteries and no lead batteries have been recovered from the family or multi-family waste stream in any of the studies.

With respect to accessibility, there was a decrease of 2 Return Collection Facilities (RCF) for a total of 253 and the CBA has changed its method of measuring its accessibility based on the new Accessibility Framework developed by the Stewardship Agencies of BC and research conducted by Statistics Canada on proximity to amenities. The summary of RCF statistics for communities of different sizes is summarized below and Table 5 lists the RCFs by community. The RCF provides consumer accessibility to 99.93% of BC's population that lives one of the 172 communities listed in Table 5.

Finally, the Canadian Battery Association will continue to work with Local Government and First Nation Communities to identify rural and remote communities that require additional accessibility.

Table 1: Summary of Targets and Performance Indicators for Lead Batteries

2021 Lead Battery Sales and Recovery			
Program Metric	Target / Report	Sales & Collection Results	Follow-Up Action
Lead Battery* Sales	Report	Sales in BC: 24,475,218kg See Non-Financial Audit	None
Lead Battery Recycled	Report	Recovered in BC: 25,226,792kg See Non-Financial Audit	None
Lead Battery Recovery Rate	Target >95%	Recovery Rate: 103.1% Target Met See Non-Financial Audit	Achieved Circular Economy for Lead Batteries
Recovery by Regional District	Report	See Table 2	Continue to work with Regional Districts to identify priority communities that would benefit from an RCF
Sales per Capita	Report	4.83 kg/person/yr ²	Continue to monitor and compare to other Provinces
Recovery per Capita	Report	4.84 kg/person/yr ²	Continue to monitor and compare to other Provinces
Diversion Rate	Report	100% - Residential 97.9% - All samples combined See Table 3	Continue to conduct Waste Characterization Studies to corroborate recovery rates and identify priority sectors
Lead Battery Consumer Awareness			
Per Cent Awareness based on Standardized Surveys	Report	See Table 4	Continue to monitor consumer awareness in 2022 using MoE approve standardized surveys

Lead Battery Accessibility			
Total Number of RCFs in the Province	Report	Total Number of RCFs: 253 (a decrease of 2 from 2020) See Non-Financial Audit	Continue to expand the number of RCFs especially and work with Provincial Government to harmonize the Hazardous Waste Regulation with the Recycling Regulation
Total Number of RCFs by Community	Report	See Table 5 for list of Communities with RCFs	Continue to work with Regional Districts & FNs to identify priority communities that would benefit from an RCF
Accessibility: Communities with Retail Option	Target 3km	<ul style="list-style-type: none"> • 89 Communities • 1.4km - Average km to Retail • 100% - Pop. served to target <p>Target Met See Table 5 for Details</p>	
Accessibility: Communities with Other Recycling Option	Target 6km	<ul style="list-style-type: none"> • 39 Communities • 2.6km - Average km to RCF • 100% - Pop. served to target <p>Target Met See Table 5 for Details</p>	
Accessibility: Communities with Recycling Option in Other Community	Target 42km	<ul style="list-style-type: none"> • 44 Communities • 17.8km - Average km to RCF • 99.1% Pop. Served to Target <p>See Table 5 for Details</p>	Continue to expand the number of RCFs especially in small communities, remote locations and sensitive areas and work with Provincial Government to harmonize the Hazardous Waste Regulation with the Recycling Regulation
% of Population Served	Report	Population Served: 99.93%	

Other 2021 Lead Battery Targets & Performance Indicators			
Use of Permitted Recycling Facilities	Target 100%	100% waste lead batteries sent to Permitted Recycling Facilities Target Met See Non-Financial Audit	Monitor and track progress year over year
Adherence to International Hazardous Waste Commitments	Target 100%	100% Compliance to International Requirements Target Met See Non-Financial Audit	Continue to monitor and work with Transport Canada and environment Canada and develop education and training programs for Transportation of Dangerous Goods and Hazardous Wastes
Value of Lead Batteries in BC	Report	Queen Charlotte City: \$5.00 Port Hardy: \$5.00 Fort Nelson: \$5.00	Monitor Prices for Auto Batteries in Small Communities
Pollution Prevention Hierarchy	Report	Lead: About 99% Recovery in Smelting Process Sulphuric Acid: Recovered by the Battery Breaker Process. Reused in various production processes Plastic Battery Casings: Recovered by Battery Breaker Process Plastic Cell Separators: Considered not recyclable	The main use of recovered lead is the remanufacturing of new batteries Recovered battery acid used in fertilizer production, battery manufacturing or galvanizing plants Primarily pelletized and reused to make new battery casing Used for energy recovery in the smelting process

* Includes consumer lead batteries includes automotive, small-sealed lead, AGM batteries and powersport batteries as well as commercial golf cart, forklift, telco, energy storage and UPS batteries.

¹ Population estimate from

<https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-estimates>

Table 2: 2021 Recovery of Lead Batteries by Regional District

Name	Population¹	Kg
Alberni-Clayoquot	34,244	165,655
Bulkley-Nechako	39,814	192,600
Capital	432,062	2,090,100
Cariboo	65,548	317,088
Central Coast	3,624	17,531
Central Kootenay	64,464	311,845
Central Okanagan	229,401	1,109,727
Columbia-Shuswap	57,567	278,480
Comox Valley	74,727	361,492
Cowichan Valley RD	91,913	444,629
East Kootenay	66,694	322,632
Fraser Valley	340,003	1,644,765
Fraser-Fort George	104,339	504,740
Metro Vancouver	2,773,150	13,415,113
Kitimat-Stikine	40,423	195,546
Kootenay-Boundary	33,650	162,782
Mount Waddington	11,684	56,521
Nanaimo	173,721	840,375
North Okanagan	93,425	451,943
Northern Rockies	4,926	23,830
Okanagan-Similkameen	91,212	441,238
Peace River	67,483	326,449
Powell River	21,441	103,721
Skeena-Queen Charlotte	19,497	94,317
Squamish-Lillooet	48,323	233,763
Stikine	708	3,425
Strathcona	50,166	242,678
Sunshine Coast	32,307	156,285
Thompson-Nicola	148,289	717,348

5,214,805

¹ Population estimate from

<https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-estimates>

Table 3: Diversion Rate of Lead Batteries Based on Landfill Studies*

	Recovered Lead Batteries		Samples	Sample Volume	Diversion Rate
	(#)	(kg)			
Residential (SF/MF)	0	0	281	27,901	100.00%
Dropoff (DO)	0	0	106	9,649	
Transfer Station (TS)	1**	0.75	33	3,277	
Construction/Demo (C&D)	0	0	3	9,750	
IC&I (ICI/ICI-WC)	3***	6.92	202	20,3111	
Overall	4	7.67	625	70,888	97.90%

* Based on summary report prepared by Tetra Tech in 2022

** 0.75kg SSLA from a heart defibrillator at a Transfer Station – assumed to be non-residential

*** 5.85kg SLA from Metro Van and 2 SSLAs from Peace River RD totaling 1.07kg

Table 4: Lead Battery Consumer Awareness Studies

Question Category	Subcategory	2013	2016	2018	2020
Currently have unwanted:	Lead Batteries	6%	8%	9%	6%
Do-it-Yourself (DIY)	Change Lead Batteries	45%	40%	38%	19%
Top-of-Mind Recyclables/Returnable/Safe Disposal	Lead Batteries				>2%
Knowledge Recyclable/Safe Return of unwanted lead batteries:	Among all Respondents	76%	78%	77%	74%
	Among those that currently have a Lead Battery				88%*
	Among DIYers that change Lead Batteries				90%
Knowledge of where to take unwanted lead batteries:	Among those that usually have a Lead Battery	44%	50%	51%	64%
	Among those that currently have a Lead Battery	54%	72%	69%	91%*
	Among DIYers that change Lead Batteries	58%	68%	68%	85%
Likely to do if Recycle/Safe disposal unknown:	Among all Respondents				81% Go Online
					8% Ask family/friend
					4% Throw Out
					4% Not sure
	Among those who currently have unwanted lead batteries				73% Go Online
					10% ask family/friend
					15% Throw out
					1% Not sure
	Among DIYers that change lead batteries				80% Go Online
					12% Ask family/friend
					6% Throw out
					1% Not sure

Usual behaviour to get rid of unwanted products:	Among those who usually have unwanted lead batteries				961% Recycle/Return
					6% Throw out
					28% Someone else
					8% Not sure
	Among those who currently have unwanted lead batteries				73% Recycle/Return
					15% Throw out
					15% Someone else
					1% Not sure
	Among DIYers that change lead batteries				84% Go Online
					5% Throw out
					7% Someone else
					2% Not sure
Reasons for not recycling/returning/safe disposing of lead batteries – among those who have unwanted lead batteries currently or those that have thrown them away in the past	Will when enough to make trip worthwhile				32%
	Don't know where to take it				26%
	Can't be bothered				14%
	Not convenient				11%
	Not sure				9%
	Other				8%
	Didn't know it could be recycled				8%
	Can't get to place				8%
Plan to re-use, fix, sell				7%	
Program Convenience – DIY Products	Among All Aware	75%	67%	72%	75%
	Among Users Aware	85%	81%	81%	81%
	Among DIY Aware	81%	73%	77%	85%
Trust in Program	Among All Aware	84%	81%	84%	89%
	Among Users Aware	85%	88%	90%	92%
	Among DIY Aware	82%	87%	86%	93%

Table 5: Summary of Lead Battery Return Collection Facilities by Community

Community	Community Population	# of RCFs	Pop/RCF Ratio	Population Serviced To CBA Target	Closest RCF (km)	Target (km)	Meet Target
Communities with Return-to-Retail Option							
100 Mile House	2,016	1	2,016	2,016	0.2	3	Yes
Abbotsford	165,070	5	33,014	165,070	0.3	3	Yes
Agassiz (Kent)	6,635	1	6,635	6,635	0.3	3	Yes
Armstrong	4,842	4	1,211	4,842	0.6	3	Yes
Barriere	1,892	1	1,892	1,892	0.2	3	Yes
Burnaby	260,918	8	32,615	260,918	2.8	3	Yes
Burns Lake	1,880	2	940	1,880	0.7	3	Yes
Cache Creek	1,064	1	1,064	1,064	0.2	3	Yes
Campbell River	36,623	4	9,156	36,623	0.8	3	Yes
Castlegar	8,570	2	4,285	8,570	3.2	3	Yes
Central Saanich	18,522	1	18,522	18,522	1.2	3	Yes
Chase	2,512	1	2,512	2,512	0.4	3	Yes
Chetwynd	2,669	1	2,669	2,669	0.3	3	Yes
Chilliwack	95,798	3	31,933	95,798	2.0	3	Yes
Clearwater	2,548	1	2,548	2,548	0.5	3	Yes
Clinton	597	1	597	597	1.5	3	Yes

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Coldstream	11,750	2	5,875	11,750	3.6	3	Yes
Colwood	19,693	2	9,847	19,693	2.0	3	Yes
Coquitlam	154,381	3	51,460	154,381	1.8	3	Yes
Courtenay	28,902	2	14,451	28,902	0.7	3	Yes
Cranbrook	21,635	2	10,818	21,635	1.5	3	Yes
Creston	5,620	1	5,620	5,620	0.8	3	Yes
Dawson Creek	13,087	2	6,544	13,087	1.2	3	Yes
Delta (Ladner & Tsawwassen)	113,695	4	28,424	113,695	2.3	3	Yes
Duncan	5,121	4	1,280	5,121	0.9	3	Yes
Enderby	3,189	2	1,595	3,189	0.3	3	Yes
Esquimalt	18,764	2	9,382	18,764	0.7	3	Yes
Fernie	5,739	1	5,739	5,739	1.3	3	Yes
Northern Rockies (Fort Nelson)	4,365	1	4,365	4,365	1.4	3	Yes
Fort St. James	1,930	1	1,930	1,930	0.2	3	Yes
Fort St. John	22,160	3	7,387	22,160	0.6	3	Yes
Ganges	6,000	2	3,000	6,000	0.2	3	Yes
Golden	4,185	2	2,093	4,185	1.6	3	Yes
Grand Forks	4,264	1	4,264	4,264	1.9	3	Yes
Hope	6,767	1	6,767	6,767	0.9	3	Yes
Houston	3,273	1	3,273	3,273	0.6	3	Yes
Invermere	3,809	1	3,809	3,809	1.8	3	Yes
Kamloops	101,603	8	12,700	101,603	0.9	3	Yes
Kelowna	149,687	9	16,632	149,687	3.0	3	Yes
Kitimat	8,564	1	8,564	8,564	3.4	3	Yes
Ladysmith	9,213	2	4,607	9,213	1.1	3	Yes
Langford	47,313	3	15,771	47,313	0.8	3	Yes
Langley (City)	28,957	6	4,826	28,957	0.6	3	Yes
Langley Township (Murrayville)	137,399	2	68,700	137,399	3.6	3	Yes
Lillooet	2,181	1	2,181	2,181	1.8	3	Yes
Lumby	2,042	3	681	2,042	0.4	3	Yes
Mackenzie	3,692	1	3,692	3,692	0.5	3	Yes
Maple Ridge	94,742	2	47,371	94,742	3.4	3	Yes
Merritt	7,606	2	3,803	7,606	0.9	3	Yes
Mission	43,270	1	43,270	43,270	0.5	3	Yes
Nakusp	1,687	1	1,687	1,687	0.3	3	Yes
Nanaimo	101,987	6	16,998	101,987	2.2	3	Yes
Nelson	11,733	1	11,733	11,733	0.5	3	Yes
New Hazelton	622	1	622	622	0.9	3	Yes
North Saanich	12,500	1	12,500	12,500	4.0	3	Yes
North Vancouver, City of	59,576	3	19,859	59,576	3.0	3	Yes
Oliver	5,591	1	5,591	5,591	1.3	3	Yes
Osoyoos	5,518	1	5,518	5,518	3.9	3	Yes
Parksville	13,871	1	13,871	13,871	2.7	3	Yes
Penticton	36,362	2	18,181	36,362	1.2	3	Yes
Port Alberni	19,101	2	9,551	19,101	0.5	3	Yes
Port Coquitlam	63,917	1	63,917	63,917	1.2	3	Yes
Port McNeill	2,441	1	2,441	2,441	0.3	3	Yes
Powell River	14,024	3	4,675	14,024	1.0	3	Yes
Prince George	82,326	6	13,721	82,326	1.1	3	Yes
Prince Rupert	13,177	1	13,177	13,177	2.4	3	Yes
Princeton	3,280	1	3,280	3,280	0.2	3	Yes
Quesnel	10,122	2	5,061	10,122	0.7	3	Yes

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Richmond	216,280	5	43,256	216,280	0.3	3	Yes
Saanich	124,639	2	62,320	124,639	2.1	3	Yes
Salmon Arm	19,825	2	9,913	19,825	1.9	3	Yes
Sechelt	10,971	2	5,486	10,971	0.3	3	Yes
Sidney	12,279	1	12,279	12,279	1.4	3	Yes
Smithers	5,697	2	2,849	5,697	0.2	3	Yes
Sooke	15,539	1	15,539	15,539	3.4	3	Yes
Sparwood	4,121	1	4,121	4,121	2.0	3	Yes
Squamish	22,253	2	11,127	22,253	1.8	3	Yes
Surrey	614,646	13	47,280	614,646	3.6	3	Yes
Terrace	13,125	4	3,281	13,125	0.7	3	Yes
Trail	8,168	2	4,084	8,168	6.2	3	Yes
Valemount	1,111	1	1,111	1,111	0.2	3	Yes
Vancouver	693,235	7	99,034	693,235	2.0	3	Yes
Vanderhoof	4,703	1	4,703	4,703	0.4	3	Yes
Vernon	44,916	4	11,229	44,916	1.4	3	Yes
Victoria	94,890	4	23,723	94,890	0.4	3	Yes
View Royal	12,034	1	12,034	12,034	0.7	3	Yes
West Kelowna	38,311	3	12,770	38,311	0.2	3	Yes
White Rock	21,522	1	21,522	21,522	2.3	3	Yes
Williams Lake	11,505	2	5,753	11,505	2.2	3	Yes
	4,154,359	214	13,574	4,154,359	1.4	1	3
					Average	STDev	Target
Community							
	Community Population	# of RCFs	Pop/RCF Ratio	Population Serviced To CBA Target	Closest RCF (km)	Target (km)	Meet Target
Community has Another RCF Option							
Bella Coola	1,900	1	1,900	1,900	4.3	6	Yes
Bowen Island	4,222	1	4,222	4,222	1.5	6	Yes
Cassidy	1,002	1	1,002	1,002	2.3	6	Yes
Cherryville	930	1	930	930	1.9	6	Yes
Cobble Hill	1,775	1	1,775	1,775	0.7	6	Yes
Cumberland	4,688	1	4,688	4,688	1.5	6	Yes
Elkford	2,741	1	2,741	2,741	5.6	6	Yes
Fraser Lake	959	1	959	959	0.6	6	Yes
Gibsons	4,968	1	4,968	4,968	3.2	6	Yes
Gold River	1,257	1	1,257	1,257	0.7	6	Yes
Granisle	311	1	311	311	0.9	6	Yes
Keremeos	1,820	1	1,820	1,820	1.8	6	Yes
Kimberley	8,308	1	8,308	8,308	5.1	6	Yes
Kitwanga	420	1	420	420	5.4	6	Yes
Lake Country	16,238	1	16,238	16,238	5.1	6	Yes
Lake Cowichan	3,600	1	3,600	3,600	2.7	6	Yes
Logan Lake	2,272	1	2,099	2,272	1.2	6	Yes
Masset	724	1	859	724	2.7	6	Yes
McBride	673	1	673	673	0.8	6	Yes
Midway	681	1	681	681	1.8	6	Yes
North Cowichan	32,850	1	32,850	32,850	4.3	6	Yes
Peachland	6,043	1	6,043	6,043	4.2	6	Yes
Pemberton	3,179	1	3,179	3,179	0.3	6	Yes

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Port Hardy	4,351	1	4,351	4,351	4.1	6	Yes
Pender Harbour	3,000	1	3,000	3,000	4.4	6	Yes
Port Clements	275	1	275	275	2.1	6	Yes
Queen Charlotte City		1			1.6	6	Yes
Revelstoke	8,429	1	8,429	8,429	4.0	6	Yes
Salmo	1,327	1	1,327	1,327	5.6	6	Yes
Sicamous	2,788	1	2,788	2,788	3.0	6	Yes
Skidegate	837	1	837	837	3.4	6	Yes
Stewart	423	1	423	423	1.0	6	Yes
Summerland	12,877	1	12,877	12,877	2.6	6	Yes
Tahsis	296	1	296	296	0.9	6	Yes
Tofino	2,618	1	2,618	2,618	5.2	6	Yes
Tumbler Ridge	2,273	1	2,273	2,273	2.3	6	Yes
Ucluelet	2,055	1	2,055	2,055	1.1	6	Yes
Whistler	13,918	1	13,918	13,918	1.8	6	Yes
Youbou	966	1	966	966	0.9	6	Yes
	157,994	39	4,157	157,994	2.6	1.7	6.0
					Average	STDev	Target

Community	Community Population	# of RCFs	Pop/RCF Ratio	Population Serviced To CBA Target	Closest RCF (km)	Target (km)	Meet Target
Need to go to Another Community for Recycling Option							
Alert Bay	434			434	11.4	44	Yes
Anmore	2,632			2,632	4.9	44	Yes
Ashcroft	1,578			1,578	9.8	44	Yes
Belcarra	678			678	7.7	44	Yes
Boston Bar	800				54.0	44	No
Canal Flats	742				42.6	44	No
Comox	15,211			15,211	3.9	44	Yes
Elko	163			163	24.4	44	Yes
Fruitvale	2,033			2,033	6.4	44	Yes
Greenwood	695			695	12.0	44	Yes
Harrison Hot Springs	1,663			1,663	7.3	44	Yes
Hazelton	335			335	6.1	44	Yes
Highlands	2,582			2,582	6.4	44	Yes
Hudson's Hope	1,069			1,069	41.2	44	Yes
Kaslo	1,039				54.7	44	No
Lantzville	3,874			3,874	2.7	44	Yes
Lions Bay	1,338			1,338	17.2	44	Yes
Lytton	276			276	38.9	44	Yes
Metchosin	5,186			5,186	5.7	44	Yes
Montrose	1,052			1,052	2.8	44	Yes
New Denver	504			504	41.5	44	Yes
New Westminster	82,866			82,866	2.3	44	Yes
North Vancouver, District Mun.	91,790			91,790	3.5	44	Yes
Oak Bay	18,930			18,930	2.6	44	Yes
Pitt Meadows	20,112			20,112	1.7	44	Yes
Port Alice	707			707	29.4	44	Yes
Port Edward	462			462	13.4	44	Yes
Port Moody	35,951			35,951	3.7	44	Yes

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Pouce Coupe	839			839	6.4	44	Yes
Qualicum Beach	9,387			9,387	7.3	44	Yes
Radium Hot Springs	879			879	12.5	44	Yes
Rosland	4,194			4,194	12.7	44	Yes
Sayward	326				56.6	44	No
Sechelt (Ind Gov.)	730			730	0.5	44	Yes
Silverton	208				45.2	44	No
Slocan	311			311	32.8	44	Yes
Spallumcheen	5,490			5,490	4.7	44	Yes
Sun Peaks	964			964	30.5	44	Yes
Taylor	1,566			1,566	13.9	44	Yes
Telkwa	1,502			1,502	12.4	44	Yes
Warfield	1,793			1,793	9.2	44	Yes
Wells	231				60.0	44	No
West Vancouver	45,503			45,503	3.7	44	Yes
Zeballos	120			120	14.6	44	Yes
	368,745	-		365,399	17.8	17.6	44

Summary of Lead Battery Accessibility Statistics for BC							
Community	Population	RCFs	RCF/Pop	Pop Served	Ave. km	Target	% Served
Return to Retail Option	4,154,329	214	12,885	4,154,359	1.4	3.0	100.0%
Other Recycling Option	157,994	39	4,157	157,994	2.6	6.0	100.0%
Go to Other Community	368,745	-	N/A	365,399	17.8	44	99.1%
	4,681,098	253		4,678,552			99.93%
Unconnected Population	533,707	10.2 %	Population living outside of a recognized community				
Total Population	5,214,805						

* Establishment of Return Collection Facilities in Sensitive Areas (e.g., Boat Marinas) is on hold until amendments to the Hazardous Waste Regulation (HWR). The amendments to the regulation will allow for the collection of lead batteries at temporary sites and then transported to an established Return Collection Facility in a larger community. Amendments to the HWR maybe completed by the end of 2021.