

Environmental Resource Management Annual Report

Capital Regional District | 2017



CRD

Making a difference...together

Table of Contents

Overview of CRD Solid Waste & Resource Management

- 04 Solid Waste Collection
- 05 Solid Waste Management Plan
- 05 Environmental Resource Management Division
- 06 Waste Stream Analysis
- 07 Solid Waste Diversion Strategy

Reduce & Reuse

- 08 Education & Outreach Programs
- 09 Compost Education Centre
- 10 Community Clean-Up Funding
- 10 Diversion Funding for Non-profit Recycling Organizations
- 10 Hartland Reusable Materials Program

Recycle

- 11 Recycling Programs
- 13 Extended Producer Responsibility
- 15 Organics Management
- 15 Household Hazardous Waste

Recovery

- 16 Hartland Gas Capture and Utilization

Residuals Management

- 17 Landfill Disposal Rates
- 17 Landfill Material Restrictions
- 18 Bylaw Enforcement
- 18 Waste Permits and Pre-Approval
- 18 Safety and Landfill Fires
- 18 Landfill Capital Works
- 19 Site Reclamation
- 19 Leachate Management
- 20 Environmental Monitoring

2017 Summary

Tables, Charts and Figures

- 04 Capital Region Municipalities and Electoral Areas
- 04 Solid Waste Collection
- 06 2016 Solid Waste Stream Composition
- 07 5R Pollution Prevention Hierarchy
- 12 Hartland Diversion Programs
- 21 Total Refuse by Type
- 22 CRD Per Capita Disposal Rate
- 23 Financial Management

Overview of CRD Solid Waste & Resource Management

Background

The Capital Regional District (CRD) is the regional government for 13 municipalities and three electoral areas on southern Vancouver Island and the nearby Gulf Islands, serving more than 392,000 citizens. There are 22 First Nations whose traditional territories span portions of the region, with 11 of those Nations holding reserve land throughout the capital region.

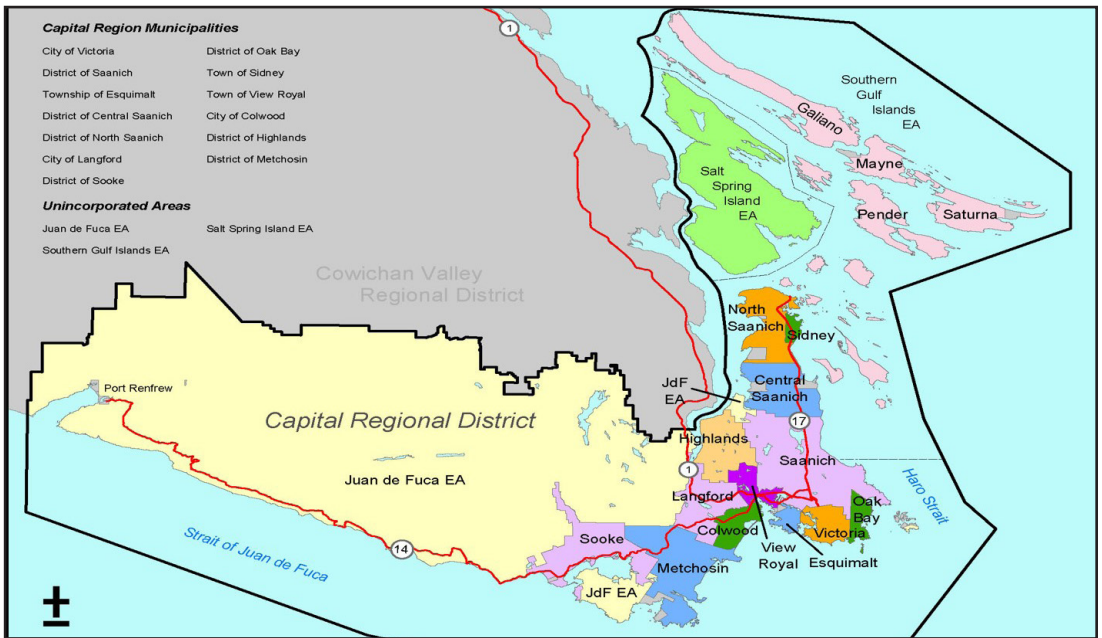
Solid Waste Disposal

The CRD became responsible for solid waste disposal for the region in 1973 when the Province of British Columbia directed all regional districts to take control of solid waste disposal within their borders.

In 1975, the CRD acquired Hartland Landfill, which had been operating as a private facility since the early 1950s. Located in the District of Saanich, the facility continued to be operated by a private contractor until 1985, when the CRD assumed direct operation of the site.

In 2008, the Highest Waste Management Facility (now owned and operated by Tervita Corporation) was added to the CRD Solid Waste Management Plan. The Tervita Highest Landfill Facility is located in the District of Highlands and primarily manages construction and demolition material.





	SERVICE PROVIDER
RESIDENTIAL MATERIALS	
Esquimalt	Municipal Programs
Oak Bay	
Saanich	
Sidney	
Victoria	
View Royal	
Central Saanich	Private Sector Services
Colwood	
Highlands	
Langford	
Metchosis	
North Saanich	
Sooke	
Salt Spring Island EA	
Southern Gulf Islands EA	
Juan de Fuca EA	
MULTI-FAMILY AND COMMERCIAL MATERIALS	
All areas	Private Sector Services

Solid Waste Collection

Collection of residential and commercial garbage and kitchen scraps is conducted by the private sector with the exception of single family dwelling collection programs offered by six of the region's municipalities.

The private sector also collects recycling from multi-family and commercial buildings. The CRD provides region-wide residential recycling through a combination of single family dwelling curbside collection and depot programs under an agreement with Recycle BC.

Solid Waste Management Plan

A solid waste management plan is a legally mandated document by the Province of British Columbia. The original CRD Solid Waste Management Plan (SWMP) was approved by the Minister of Environment in 1989.

There have been two subsequent revisions to the original plan plus eight amendments. In 2012, the CRD started the development of a new SWMP.

Work on the new plan was put on hold in 2015 to investigate integrated resource management opportunities. In November 2017, the CRD Board directed staff to resume work on the plan and to recruit members for a new Solid Waste Advisory Committee.

Environmental Resource Management Division

Environmental Resource Management's (ERM) mission is to efficiently and effectively manage the region's solid waste resources in an environmentally, socially and economically responsible manner. The ERM division is responsible for municipal solid waste management in the capital region, including waste reduction, recycling programs and operation of Hartland Landfill.

The ERM division is part of the CRD Parks & Environmental Services department and consists of:

Diversion services

- Planning and policy
- Recycling and composting programs

Recovery services

- Landfill gas capture
- Electricity generation

Landfilling services

- Disposal services
- Environmental compliance

ERM reports to the Environmental Services Committee, which also acts as the steering committee for the development of the new SWMP.

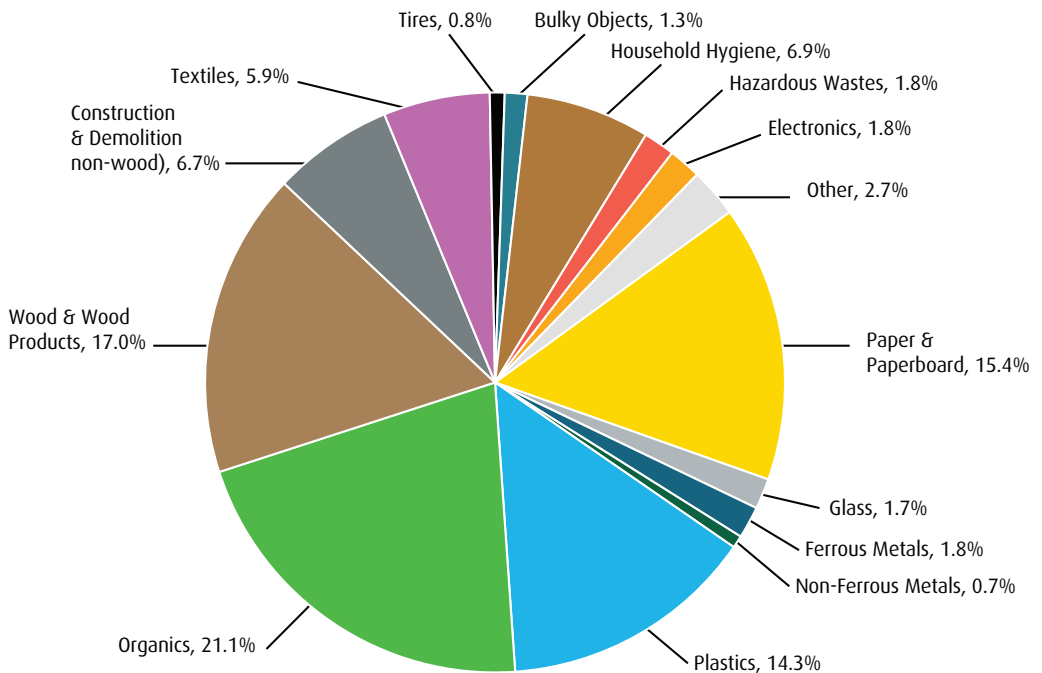


Waste Stream Analysis

Since 1990, the CRD has commissioned six studies to assess the composition of waste being landfilled at Hartland. These studies provide valuable benchmark data and analysis for evaluating the success of existing solid waste programs and planning future initiatives.

The sixth waste stream analysis took place in 2016. The results indicate a broad regional trend towards decreased waste generation. Per capita organic waste generation dropped by 37.5%, indicating the successful launch of the 2015 kitchen scraps ban. Per capita paper disposal decreased by 18% and plastics by 5%, while wood and wood products increased by 15%, likely due to more construction activities in the region. All other materials remained relatively consistent compared to the previous study in 2010.

2016 SOLID WASTE STREAM COMPOSITION STUDY RESULTS



Solid Waste Diversion Strategy

Environmental resource management in the Capital Regional District is based on the 5R hierarchy of Reduce, Reuse, Recycle, Resource Recovery and Residuals Management. The plan is to extend the life of Hartland Landfill by minimizing waste disposal and maximizing diversion opportunities.

In 2014, the Ministry of Environment created the BC Waste Disposal Calculator and adopted a new service plan target of 350 kg/capita solid waste disposal by 2020. Based on the Ministry's revised calculation method, the CRD's per capita disposal rate was 407 kg/capita in 2017.



Ministry of Environment 5R Pollution Prevention Hierarchy

Reduce & Reuse

Education & Outreach Programs

A number of education and outreach programs are in place to support solid waste disposal and diversion services as well as waste avoidance practices.

Activities include:

- Education and outreach for all solid waste programs
- Communication planning and research
- Advertising, promotional and educational materials
- Media relations (print, radio, television and digital platforms)
- Timely social media content
- Presentations, tours and outreach displays

InfoLine

The InfoLine is an essential part of education and outreach programs. This service responds to waste reduction, waste management and general Hartland Landfill inquiries, including recycling best practices. An automated voice messaging service (250-360-3030) is available 24 hours a day and messages are responded to within 24 hours on weekdays. Waste and recycling information can also be found on the CRD website at www.crd.bc.ca/waste or by emailing info@crd.bc.ca.

MyRecyclopedia.ca

MyRecyclopedia.ca contains a comprehensive online listing of household products and items—from aerosol containers to zinc—and includes the environmental story behind each item, recycling listings and tips on how to reduce and reuse each item in our daily lives. MyRecyclopedia.ca was developed to encourage sustainable practices and reinforce the 3Rs of Reduce, Reuse and Recycle. It receives over 200,000 web visits per year.

Ready, Set, Sort!

New for 2017 is an online waste sorting game where residents can test their knowledge about local recycling opportunities. The game includes 76 items, six bins and five levels of play and can be accessed through MyRecyclopedia.ca.

The Hartland Learning Centre

Environmental education is of paramount importance to the CRD, and the Hartland Learning Centre allows for place-based learning, giving our youth and our communities a chance for experiential, interactive involvement in education. Place-based learning links a learner to the space around them, creating awareness of natural and social history and the relation of our community with the rest of the world.



Compost Education Centre

The Compost Education Centre (CEC) was established in 1992 to educate CRD residents about composting, ecological gardening practices and soil conservation. Under contract to the CRD, the CEC annually offers presentations, workshops, educational compost demonstrations, volunteer training, monthly e-newsletters and maintains the CEC Hotline and website. In 2017, the CEC celebrated 25 years of composting and conservation education.

In 2017, the CEC delivered 176 school programs to 4,227 children from Preschool to Grade 12, and facilitated 46 community workshops and learning events on topics from Soil Science 101, to Grow Your Own Food and Composting Basics. Over 97,500 residents participated in one of twenty-five community events, documentary nights and community compost demonstrations. In 2017, over 16,800 residents visited the CEC's demonstration site or participated in an educational community event or compost demonstration.

Over the course of the year, the CEC hosted four core community education open houses, including the spring and fall organic plant sales, the 25th anniversary garden party and tour and a community open house. These educational events encourage stewardship of the environment and give community residents the tools and skills to compost, grow their own food and conserve soil and water. The CEC continues to support the CRD kitchen scraps landfill ban through programming workshops and events that emphasize accessible education around food waste diversion, both on and off-site. The CEC promotes the use of backyard composting and food waste digesters and has increased its capacity throughout 2017 to better serve the rural regions of Sooke and the Gulf Islands. Since 1992, the CEC has made over 1,394,000 contacts with CRD residents.



Community Clean-Up Funding

The CRD Community Clean-up program has been supporting non-profit groups that make visible environmental improvements to their community through organized clean-ups, since 1997.

Funding provided supports:

- Collection, processing and marketing of recyclables recovered during clean-up
- Container rental for transportation and disposal of non-recyclable material
- Supplies, such as rubber gloves and collection bags

In 2017, the CRD provided funding to eleven non-profit groups, including the staff from the Ministry of Advanced Education for their Dallas Road beach clean-up.

Diversion Funding for Non Profit Recycling Organizations

Since 1992, the CRD has provided funding to non-profit organizations involved in recycling clothing and used household goods. The funding assists with their garbage disposal costs at Hartland, in recognition that some donated used goods are unusable and destined for the landfill. Ten organizations participated in the program in 2017.

Hartland Reusable Materials Program

The CRD partners with five organizations for the management of donated items received at the Hartland depot. Goods such as textiles, books and bicycles are redistributed through a variety of networks operated by these non-profit associations.



Recycle

Recycling Programs

Curbside Recycling

Under agreement with Recycle BC, the CRD provided 121,892 single family dwellings with curbside recycling service for packaging and paper products in 2017. The curbside program is a successful three-stream recycling model which ensures the highest quality and value for marketing of the material.

Since the program's inception in 1989 over 453,000 tonnes of recyclables have been collected.

Gulf Islands Depots

Residents in rural areas such as Salt Spring Island and the Southern Gulf Islands, are provided recycling services through drop off programs set up at depots in their communities. The CRD, under agreement with Recycle BC, partners with local non-profit associations for recycling services for PPP at these depots.

In addition to packaging and paper product recycling, these depots typically offer recycling services for additional items and in some cases also offer other services such as a free store.

2017 ACHIEVEMENTS

LANDFILL TOURS

- 68 school tours
(1,745 participants)
 - 25 community tours
(636 participants)
 - 24 technical tours
-

PRESENTATIONS

- 79 school workshops
(1,993 participants)
 - 15 community workshops
(331 participants)
-

INFOLINE

- 18,273 phone calls to
automated system
- 4,063 phone messages
- 1,537 email messages

Port Renfrew Transfer Station

Under a local service funded by the community of Port Renfrew, residents and businesses have access to a transfer station for drop off of general refuse, kitchen scraps and recycling.

Hartland Public Drop-off Depot

The public drop-off depot at Hartland receives garbage, recyclables and household hazardous waste. Over 80 items from 28 product categories are accepted for recycling. This area is intended for residential quantities only for vehicles with a maximum GVW of 5,500 kg.

2017 Recycling Fees:

- \$110/tonne for mattresses and box springs, plus \$10 bin fee
- \$59/tonne for yard and garden material
- \$6 fee for some recycling items (residents)
- \$26 gate fee for recycling area (small load private collectors)
- \$20 for appliances containing refrigerants
- No charge for extended producer responsibility products
- No charge for household hazardous waste



HARTLAND DIVERSION PROGRAMS

	(Tonnes)
Antifreeze	13
Appliances	192
Batteries	42
Books	55
Containers (metal, plastic)	54
Cooking Oil	6
Electronics and Electrical Items	312
Fibres (paper/cardboard)	522
Foam Packaging	10
Fire Extinguishers	2
Food Waste	6,493
Glass (bottles, jars)	32
HHW Orphans	59
Light Bulbs, Tubes, Ballasts	9
Mattresses	385
Metals	970
Motor Oil, Filters, Containers	71
Paint, Solvents, Pesticides	218
Plastic (Bags & Overwrap)	10
Plastic (Large Rigid)	137
Propane Tanks	20
Refundable Containers	11
Reusable Goods	14
Tires	68
Yard & Garden Material	917

TOTAL 2017 RECYCLING

10,622

Extended Producer Responsibility

British Columbia's industry-led product stewardship programs require producers of designated products to take Extended Producer Responsibility for the life-cycle management of their products, including collection and recycling. The BC Recycling Regulation, under authority of the Environmental Management Act, sets out the requirements for product stewardship in BC.

The CRD supports industry-led product stewardship with participation in the following provincial programs:

Beverage Containers (refundable)

Refundable glass, plastic, aluminum, metal and polycoated beverage containers are accepted at the Hartland depot and Electoral Area recycling depots. Beverage bags and pouches are not included in CRD programs. Refundable beverage containers are also accepted at participating retail stores and private depots.

Electronics, Electrical Products, Batteries and Lighting Products

Since 2014, the CRD has partnered with seven stewardship agencies for the collection of electrical items at the Hartland recycling facility:

- Encorp Pacific (computers, monitors, printers, TVs, audio visual)
- ElectroRecycle (small appliances, power tools, sewing machines, exercise equipment)
- Call2Recycle (batteries and mobile phones)
- LightRecycle (residential fluorescent lamps and CFL bulbs and lighting fixtures)
- Switch the 'Stat (thermostats)
- AlarmRecycle (smoke detectors)
- Outdoor Power Equipment (processed through metal recycler)

Lead-Acid Batteries

Lead-acid batteries have been accepted at the Hartland depot since 1992, shortly after the BC Lead Acid Battery Collection program was introduced. This first generation program transitioned in 2012 to being managed under the BC Recycling Regulation. Batteries are broken down at smelters into lead, plastic and acid.

Paints, Solvents, Flammable Liquids, Gasoline and Pesticides

In 1994, the CRD began working with the Product Care Association to provide the region with waste paint collection at the Hartland depot. Since then, the program has expanded to include solvents, flammable liquids, gasoline, pesticides (paint plus) and a paint exchange.

Product Care Association depots in the region:

- 1 paint plus with paint exchange (Hartland Recycling)
- 3 paint plus
- 2 paint only with paint exchange
- 5 paint only

Pharmaceuticals

The Medications Return Program is promoted regionally through the CRD InfoLine, CRD website and myrecyclopedia.ca, as well as in CRD Source Control messaging. The CRD works in partnership with the Medications Return Program and the Vancouver Island Health Authority to raise awareness about safe and proper disposal of medications. Through 2014, the CRD continues to have one of the highest medication return rates per capita amongst regional districts in the province.

Packaging and Paper Products

In 2011, the BC Recycling Regulation was amended to add packaging and paper products from residential generators. The amendment shifted the financial responsibility for managing these materials to producers as of May 2014. Packaging and paper products are managed through a combination of curbside collection and depot drop off which are provided locally by both the CRD and the private sector.

In 2017, a total of 20,470 tonnes of packaging and paper products were collected by Recycle BC's partners in the region, with the CRD providing collection services for 96% of the material through programs listed below:

- Curbside Blue Box Program – 18,185 tonnes
- Gulf Island Recycling Depots – 881 tonnes
- Hartland Depot – 559 tonnes
- Port Renfrew Transfer Station – 26 tonnes

Tires

Tires have been accepted at the Hartland depot since it opened in 1992, in conjunction with the province's Financial Incentives to Recycle Scrap Tires ("FIRST") program. In 2007, this provincial initiative was replaced with a product stewardship program under the BC Recycling Regulation managed by Tire Stewardship BC (TSBC). TSBC, in partnership with the Bicycle Trade Association of Canada and the local biking community, also offer a voluntary program for the recycling of tires and tubes through bike retailers. Collection of bicycle tires and tubes at the Hartland depot began in 2011.

Used Lubricating Oil, Filters and Containers

The BC Used Oil Management Association manages the product stewardship program that provides for the collection and recycling of used oil, oil filters, antifreeze and containers. The program strives to ensure every drop of used oil and antifreeze, every filter and container, is brought to a collection facility to be properly recycled.

Organics Management

Regional Kitchen Scraps Strategy

In January 2015 a landfill ban on kitchen scraps was implemented, saving a valuable resource, conserving landfill space and reducing greenhouse gas emissions. Kitchen scraps are typically managed in one of two ways, onsite digestion or collection for transportation to composting facilities in the Cowichan Valley Regional District and on the lower mainland. Establishment of in-region (or near-region) kitchen scraps processing capacity is being explored.

Compost Facilities Bylaw

The CRD Board adopted the regional composting facilities bylaw in December 2005. The bylaw regulates the operation of composting facilities to protect public health and the environment. In 2017, there were no licensed facilities under the bylaw.

Yard & Garden Material Landfill Restriction

In 2006, a yard and garden material landfill ban came into effect. A number of private facilities in the area accept the region's yard and garden material. In 2017, just over 900 tonnes of source-separated yard and garden material was received at Hartland where it was ground and used on-site. The landfill ban excludes invasive, infectious and noxious plants which are managed at Hartland as garbage through a reduced rate of \$59/tonne in an effort to reduce their expense.

Household Hazardous Waste

The Hartland depot offers residents one stop drop-off service for virtually all types of household hazardous waste and is a leading program of its kind in British Columbia. The material is accepted in residential quantities only, at no charge, for recycling (where feasible) or disposal at a special waste management facility.

In 2017, Hartland hosted an obsolete pesticide and livestock medications collection event. This program, managed by Cleanfarms, a non-profit environmental stewardship organization, works to ensure farmers from across Canada contribute to a healthy environment and a sustainable future. Offered in each province at least once every three years, this program allows farmers to drop off obsolete materials at a designated collection site at no charge.



Recovery

Hartland Gas Capture and Utilization

Landfill gas has been captured at Hartland since the late 1990s.

In 2012, a site specific Landfill Gas Management Plan (LFGMP) was approved which detailed a strategy for capturing landfill gas and meeting BC Ministry of Environment collection targets. The Plan includes installation, operation and maintenance of collection infrastructure and routine reporting. As a result, landfill gas collection has increased significantly and greenhouse gas emissions have been reduced by approximately 50% since 2011.

Collection infrastructure continues to be installed in accordance with the LFGMP. In 2017, the landfill gas collection efficiency was approximately 68% compared to a target of 75%. The current landfill gas collection efficiency is within estimated ranges in the LFGMP. Target efficiencies are expected to be reached when full build-out is achieved. Staff are continually investigating other resource recovery opportunities.

A CRD owned generator uses captured landfill gas to produce electricity which is fed back to the power grid.

Residuals Management

The Hartland facility is a multi-purpose site which, in addition to landfill services for general refuse and controlled waste, provides drop off for recycling, compostables and household hazardous waste.

Hartland has received the Silver Landfill Management Excellence Award from the Solid Waste Association of North America as well as awards for leadership and innovation in gas utilization and best practices for household hazardous waste collection. The CRD has also received awards for safety initiatives, including the prestigious National Award for Best Safety Week Program in Canada, in which Hartland Landfill played a major role.

Landfill Disposal Rates

Landfill tipping fees provide a financial incentive to reduce the quantity of solid waste being brought to the landfill for disposal. The tipping fee structure for 2016 included:

- \$110/tonne for general refuse
- \$157—\$500/tonne for controlled waste
- \$254/tonne for bulky waste

Landfill Material Restrictions

Landfill restrictions have been part of the CRD waste diversion strategy since 1991 and are only implemented when viable and sustainable recycling alternatives exist. Recyclable materials banned from disposal include:

- 1991 - Drywall
- 1993 - Corrugated cardboard, white goods, tires, directories
- 1995 - Scrap metal, aggregate, concrete, asphalt, rubble, clean soil
- 1998 - Paper fibers
- 2006 - Yard and garden material
- 2011 - Extended Producer Responsibility products
- 2015 - Kitchen scraps

Waste Permits and Pre-Approval

Landfilling of certain types of wastes creates potential nuisance, health and safety concerns for staff (or environmental concerns beyond those expected from regular household refuse). Examples of these wastes are asbestos, demolition wastes, animal fecal wastes and deceased animals. These wastes require special handling to protect the health and safety of employees and reduce impacts to the landfill leachate. Some of these wastes are placed in designated areas of the landfill and are covered often to minimize nuisance, odours and scavenging by birds.

These wastes require a permit or pre-approval and usually an appointment for disposal. There are four regulated waste types: asbestos waste, controlled waste, clean demolition waste (commercial) and renovation waste (residential). The requirements for each type of waste differ by risk and therefore each are managed differently at the landfill.

The renovation waste (residential) pre-approval requirement was piloted in 2017 and will be fully launched in 2018. This new requirement mirrors permit requirements for commercial loads and was implemented to meet WorkSafeBC health and safety requirements and ensure staff and public safety. Renovation pre-approvals are consistent with and build upon current WorkSafeBC messaging regarding the health risks of working around asbestos.

Bylaw Enforcement

CRD Bylaw 3881, Hartland Landfill Tipping Fee and Regulation Bylaw regulates activities at the Hartland site. CRD Bylaw Enforcement officers as well as landfill staff ensure Hartland customers adhere to site regulations. In 2017, 54 written warnings and 505 enforcement tickets were issued. The majority of enforcement tickets were in relation to the deposit of Recyclable Material (49%), Extended Producer Responsibility Product (17%), Kitchen Scraps (16%) and Prohibited Materials (11%) which combined comprised 93% of the tickets levied.

Safety and Landfill Fires

Landfill fires happen periodically at Hartland and are typically the result of improper disposal of household hazardous waste, such as batteries and chemicals. Staff and local emergency services personnel respond to fire incidents at the active face following an established fire safety plan.

Landfill Capital Works

Since 1985, over \$44 million has been invested in capital works, environmental controls, and general site improvements.

In 1997, Phase 1 of the landfill site was closed and the filling of Phase 2 (Heal basin) was initiated. It is expected that Phase 2 will continue to receive landfill materials until about 2048, at which time it will have reached its current design capacity.

Achievements for 2017 include:

- Project management and direction for Hartland heavy equipment services contract
- Installation and activation of existing gas/leachate collection infrastructure from the Phase 2, including the 175m and 179m lifts to the gas plant and leachate lagoons
- Annual installation of new combined gas/leachate collection infrastructure in Phase 2, Cell 3, 155m lift
- Installation of a temporary cover system for northeast Phase 2 Cell 2 slopes
- Landfill capacity and aggregate stockpile studies progressed
- Construction of the microtunnel clean out chamber retrofit to allow for inspection and cleaning
- Design of a new aggregate stockpile storage pad adjacent to the northern extent of the landfilling footprint boundary road
- Removal of aggregate from the Hartland North stockpile area to allow for the future construction of the residuals treatment facility
- Construction of an access road from the landfill footprint boundary road to Hartland North

Site Reclamation

Since the Phase 1 closure, significant efforts have gone towards site rehabilitation. A long-standing vision for Hartland Landfill is to restore the land to a condition that will blend in naturally with the surrounding forest. Planting began in 2004 and includes Douglas fir, bigleaf maple and red alder, as well as ocean spray, Indian plum and mock orange (all of which are native to the area). Cell 1 final closure design was completed in 2010 which included a final cover complete with a new wetland sedimentation pond in addition to gas, leachate and road upgrades. Over 22,000 trees and bushes have been planted over Phase 1 of Hartland Landfill. Annual invasive species removal projects are conducted in these reclaimed areas to encourage native plant species.

Leachate Management

Leachate is liquid that is produced when precipitation comes into contact with decomposing refuse. To minimize the leachate generated on site, impermeable covers are installed over completed fill areas to divert clean surface water away from the landfill area. In 2017, extension of a temporary closure system on the northeast face of Phase 2 Cell 2 was constructed using a linear low-density polyethylene tarpaulin cover system. This temporary closure reduces the total leachate generation area of the landfill. All leachate is collected to settling lagoons and monitored before discharge into the sanitary sewer system.



Environmental Monitoring

Hartland Landfill employs a number of control measures to prevent or reduce potential effects on groundwater, surface water and air. Through 40 years of engineered controls, groundwater and surface water quality at Hartland Landfill has continually improved. An environmental monitoring, assessment and management program is conducted in accordance with BC Ministry of Environment requirements. The monitoring program measures water quality at and near the landfill as well as the effectiveness of control measures.

Groundwater quality monitoring data obtained in 2017 was similar to previous years and indicated that landfill leachate is effectively contained and controlled on site. Leachate quality monitoring confirmed that leachate discharged from the site was in compliance with CRD's Sewer Use Bylaw, which regulates discharges to the sanitary sewer. Surface water monitoring in 2017 indicated that nearby surface water bodies, Tod Creek, Durrance Creek, Durrance Lake, and Killarney Lake are not impacted by leachate.

Landfill gas monitoring confirmed that the landfill gas collection system worked effectively to control emissions. Landfill gas infrastructure continues to be installed as part of a long-term gas management plan.

2017 Summary

Environmental resource management in the Capital Region consists of a complex and mature materials management system that is constantly evolving. The Environmental Resource Management division uses its mandate to educate, facilitate and regulate to minimize waste and maximize resources.

An increase in waste volumes and subsequent tipping fee revenue due to both a healthy local economy and real estate market has contributed to a revenue surplus and a significant increase in the per capita disposal rate.

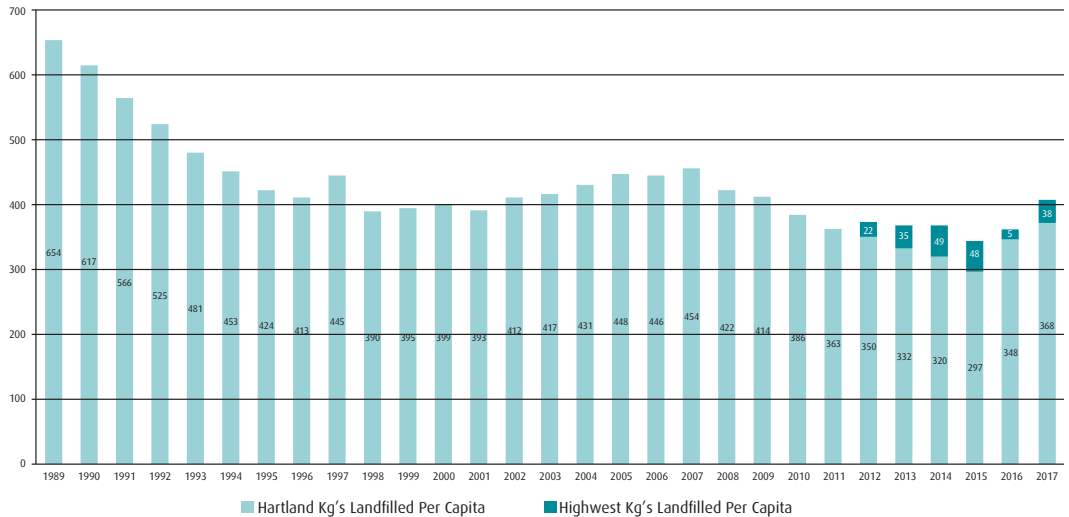
Total Refuse by Type (tonnes)

Type of Waste Declared	2016	2017	% Change
General Refuse	134,167	144,368	8%
Controlled Waste	9,662	10,104	5%
Asbestos	2,875	3,166	10%
Total	146,704	157,638	7%

• Asbestos also includes material from outside the region



CRD Per Capita Disposal Rate



In 2012, the Province of British Columbia began using per capita disposal rates as the standard solid waste metric and is targeting 350 kg/capita by 2020. Based on the Ministry of Environment's new calculation method, the CRD's disposal rate for 2017 was 407 kg/capita.

Year	Population ¹	Hartland landfill			Tervita Highest Landfill ²	Disposal Rate (kg/person)
		Received	Beneficial Use	Landfilled		
2012	368,935	129,279	n/a	129,279	7,880	372
2013	371,265	123,210	n/a	123,210	13,025	367
2014	372,463	120,942	-1,636	119,306	18,000	369
2015	377,810	114,476	-2,034	112,442	18,000	345
2016	382,645	134,167	-971	133,196	2,056	353
2017	392,046	145,285	-917	144,368	15,000	407

¹ BC Stats

² 80% of facility's total disposal in recognition of out-of-region waste being landfilled at site

Financial Management

A sustainable financial business model is essential for the provision of solid waste services. In the CRD, the majority of funding has traditionally been drawn from landfill tipping fees, with a new significant funding source from product stewardship programs being added in 2014. This form of financing has practical limits as diversion increases and landfill volumes decline. Long term financial sustainability of the CRD solid waste function will form a critical part of the new Solid Waste Management Plan.

All costs associated with CRD solid waste disposal and diversion programs are funded through tipping and user fee revenues at Hartland Landfill, service delivery agreements for stewarded materials, sale of electricity and sale of recyclables.

REVENUES	
Tipping fees	\$18,337,810
EPR programs	\$5,455,440
Power plant	\$579,585
Recycling program revenues	\$1,159,669
Permits, fines and miscellaneous	\$123,969
TOTAL	\$25,656,473
COSTS	
Recycling collection programs	\$5,232,389
Landfill operations	\$4,939,025
Capital spending	\$3,209,000
Hartland diversion programs	\$2,956,421
Debt charges	\$646,015
Power plant costs	\$588,732
EA recycling programs	\$571,430
Leachate	\$492,077
Closure and post-closure fund	\$420,000
Equipment and vehicle fund	\$303,400
Planning	\$384,989
Community support programs	\$231,651
TOTAL	\$19,735,334
Surplus	\$5,921,139

