

Environmental Resource Management Annual Report

Capital Regional District | 2013



CRD

Making a difference...together

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Overview of CRD Solid Waste Management

Background

The Capital Regional District (CRD) is the regional government for the 13 municipalities and three electoral areas located on the southern tip of Vancouver Island. The urban centre of the Capital Region is the City of Victoria, and the regional district also includes many Gulf Islands, a number of rural municipalities and a vast tract of wilderness that lies along the southwestern coast of Vancouver Island.

The CRD provides regional governance and services for the entire Capital Region, including regional parks, regional planning and solid waste management. The CRD creates partnerships between any combination of municipalities and electoral areas for services or projects that are specific to only part of the region.

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. Hartland landfill, which had been operated as a private facility since the early 1950s, was acquired by the CRD in 1975. The facility continued to be operated by a private contractor until January 1985, when the CRD assumed direct operation of the site.

Aerial photo of Hartland landfill and recycling facility, July 2013.





Compactor at Hartland's active face.

Hartland landfill and recycling facility is owned and operated by the CRD and is located about 14 km northwest of Victoria. It is a multi-employer site and is the only sanitary landfill in the Capital Region, serving just over 382,000 people. The operation is a multi-purpose facility providing: recycling, household hazardous waste (HHW) collection, a salvage area, yard and garden waste collection and processing, controlled waste disposal and landfill services to commercial and residential customers.

Residential garbage collection services in the region are provided by municipal crews or contractors in six municipalities. Residents in the remaining seven municipalities and three electoral areas, as well as all commercial business, are serviced by private haulers.

All solid waste programs are funded with revenue generated from fees collected at Hartland landfill, the sale of recyclable materials and landfill gas and participation in extended producer responsibility programs. No funding is drawn from the municipal tax system.

Solid Waste Management Plan

*Integrated Solid Waste and
Resource Management Plan*



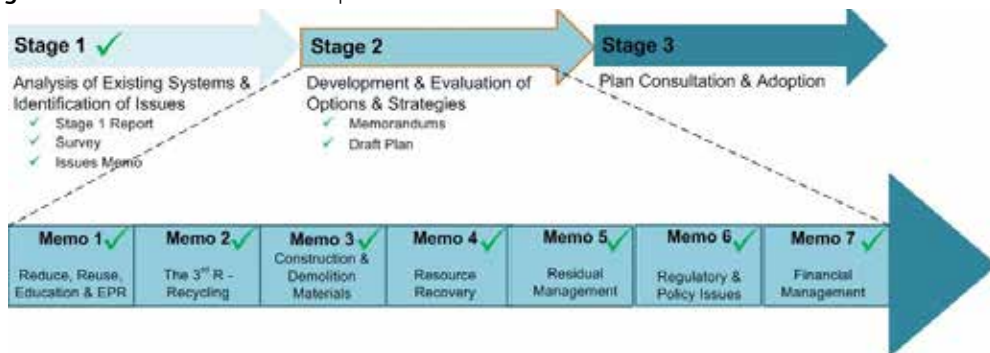
The Solid Waste Management Plan is a legally binding document mandated by the Province of British Columbia. The original CRD Solid Waste Management Plan was approved by the Minister of Environment in 1989. There have been two subsequent revisions to the original plan plus eight amendments. In 2012, the CRD started the development of a new Integrated Solid Waste and Resource Management Plan and appointed a Public and Technical Advisory Committee.

The development of the new plan involves three stages:

Stage 1: Analysis of Existing Systems and Identification of Issues

Stage 2: Development and Evaluation of Options and Strategies

Stage 3: Plan Consultation and Adoption



Stage 1 was completed in 2012, including a report of existing programs, a public survey and a list of issues for consideration during the development of the new plan. Stage 2, which consists of technical memorandums on solid waste topics and the development of the draft plan, began in 2013 and is expected to be completed in 2014. The new plan is expected to be finalized in 2015.

Environmental Resource Management Division

With a mandate of focusing on the environmental future, Environmental Resource Management is responsible for planning, developing and applying systems that will best ensure an integrated and beneficial use and reuse of our resources, some of which may now be seen as waste. For example, rather than looking at waste to be disposed of, the CRD is focused on looking at waste as a commodity for beneficial reuse. This includes a focus towards zero waste in our landfill, landfill gas capture, utilization of other energy from waste initiatives, compost and organics initiatives, and other emerging opportunities.

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

- Landfilling Operations
- Landfill Gas Utilization
- Recycling Programs
- Hartland Public Drop-off Area
- Household Hazardous Waste Collection
- New Waste Reduction Initiatives
- Regulatory and Financial Management
- Planning and Policy Development



Hartland staff tarping and securing their load.

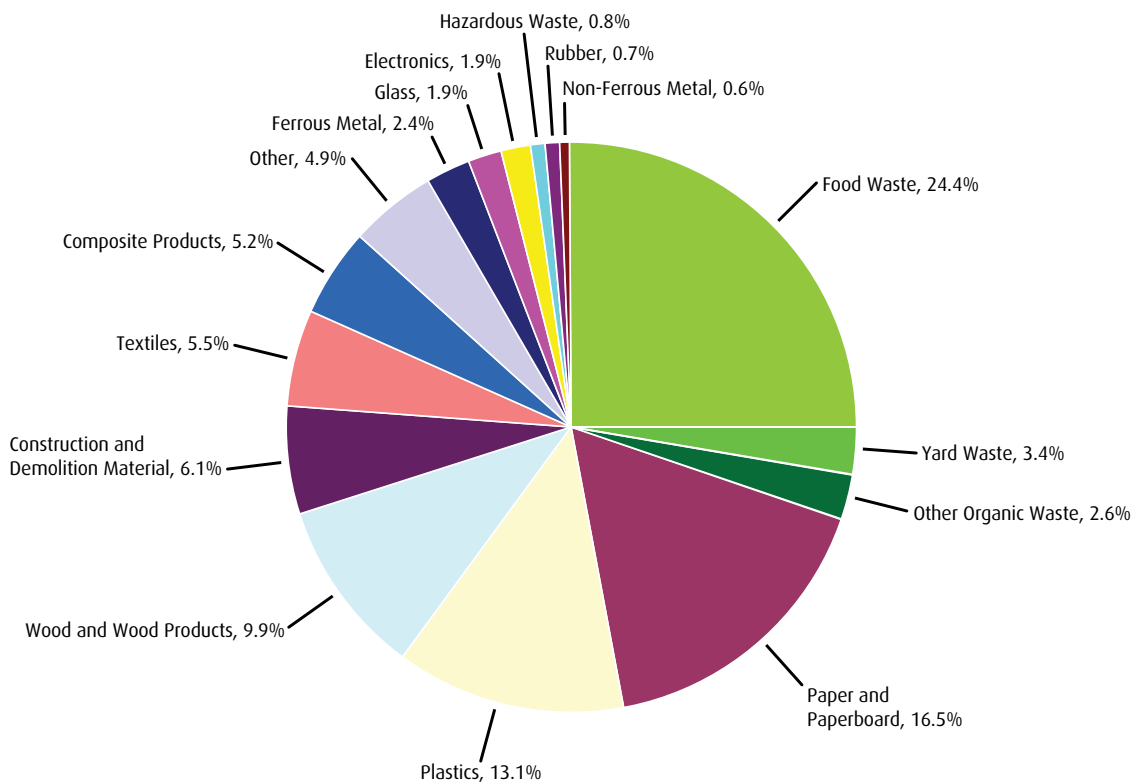
The solid waste function of the CRD reports to the Environmental Services Committee (ESC). The ESC is supported by two advisory committees. The Solid Waste Advisory Committee (SWAC) provides feedback to ESC on solid waste operational issues. SWAC also acts as the Plan Monitoring Advisory Committee to monitor the implementation of the CRD Solid Waste Management Plan, as required by the BC Ministry of Environment. The Salt Spring Island Solid Waste Advisory Committee provides a community based forum for discussion of solid waste and resource management issues on Salt Spring Island. The Environmental Services Committee also acts as the steering committee for the development of the new Integrated Solid Waste and Resource Management Plan.

Waste Stream Analysis

Since 1990, the CRD has commissioned five studies to assess the composition of waste being landfilled at Hartland. These studies provide valuable benchmark data and analysis for evaluating the success of solid waste management programs. The studies also provide information on waste types to target, for example, household hazardous waste in 2001 and, most recently, organic materials such as yard and garden waste and kitchen scraps.

The latest waste stream analysis took place in 2009/2010, with one phase conducted in the fall of 2009 and the second phase conducted in the spring of 2010. The study is conducted in two phases to allow for seasonal variance. A detailed statistical evaluation was completed as part of the final report that was published in 2010. Objectives of the study included determining the overall waste composition by material type, characterizing the waste by source sector (residential, industrial/commercial/institutional and demolition/land clearing), and reviewing trends from different areas of the Capital Region.

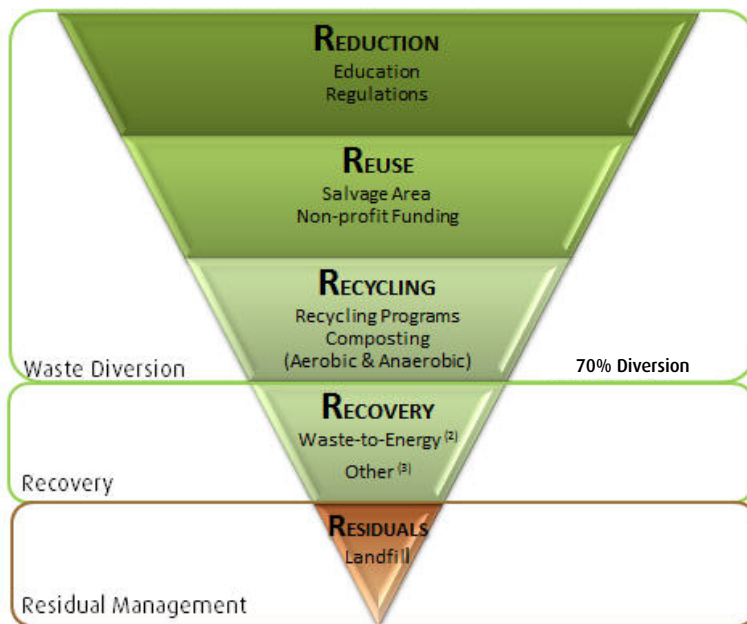
2009-2010 Solid Waste Stream Composition Study



Solid Waste Diversion Strategy

Environmental resource management in the Capital Regional District is based on the 5R hierarchy of Reduction, Reuse, Recycling, Resource Recovery and Residual Management. The plan is to extend the life of Hartland landfill by minimizing waste disposal and maximizing diversion opportunities. The key strategies to divert waste from Hartland landfill are outlined in the 5R graphic.

CRD Solid Waste and Resource Management Strategy



⁽¹⁾ The Ministry expects local government to have a minimum target of 70% waste reduction before utilizing a WTE facility as a waste management option.

⁽²⁾ A WTE facility has to achieve 60% energy efficiency to be considered resource recovery. Otherwise it will be classified as residual management.

Reduce & Reuse

Education & Outreach Programs

The Environmental Resource Management division, with support from Environmental Partnerships and Corporate Communications, has a number of education programs that support all solid waste diversion services in addition to promoting behaviour changes based on the Waste Diversion 3Rs. These behaviour changes contribute significantly to the “qualitative diversion” of waste from landfill. Education services include:

- Education and outreach for all solid waste programs
- Communication planning and research
- Advertising, promotional and educational materials
- Media relations (print, radio and television)
- Presentations, tours and outreach displays
- Hartland bi-annual open house

CRD Hotline

The CRD Hotline (250.360.3030) is an essential part of education and outreach programs. Callers can access an automated voice messaging service 24 hours a day or speak with a Hotline clerk during office hours of 8:30 am to 4:30 pm (closed 12 noon to 1 pm). The CRD Hotline can be reached by e-mail at Hotline@crd.bc.ca. Information can also be obtained on the CRD website at www.crd.bc.ca.

Myrecyclopedia.ca

Myrecyclopedia.ca contains a comprehensive online listing of household products and items—from aluminum to zinc—and includes the environmental story behind each item, recycling facility listings and tips on how to reduce and reuse in daily living. Myrecyclopedia was developed to encourage sustainable practices and to reinforce the 3Rs of Reduce, Reuse and Recycle.



The Hartland Learning Centre



Environmental education is of paramount importance to the CRD, and the Hartland Learning Centre allows for place-based learning, which gives our youth and our communities a chance for experiential, interactive involvement in education. Place-based learning links learners to the space around them, creating awareness of natural and social history and the relation of our community with the rest of the world. The Learning Centre hosted over 135 school workshops and landfill tours in 2013, for over 3,700 participants.

Green 365 Initiative



Green 365 is a year-long campaign, which launched in June 2013, promoting the use of green behaviours in and around the home. The campaign aims to provide free resources, tools and information to illustrate that doing the green thing is easy and has many rewards.

Abandoned Waste & Illegal Dumping Campaign



The Abandoned Waste and Illegal Dumping campaign was launched in April 2013. The primary goal of this campaign is to raise awareness about abandoned waste and illegal dumping and promote how to safely and responsibly dispose of unwanted household items.

Abandoned Waste is defined as waste placed in public spaces (such as boulevards) or left at non-profit recycling organizations, often with the intention of re-using, but ending up as garbage.

Illegal Dumping is defined as waste purposefully left in private or public areas instead of being properly recycled or safely and legally disposed.

Every year, municipalities and local non-profit charities are burdened with improperly disposed of waste. There are many economic, social and environmental issues associated with abandoning waste and illegally dumping materials. The estimated volume of waste associated with this problem is 650 tonnes per year.



University of Victoria students at the Abandoned Waste campaign launch at the Student Union Building.

This campaign focused on encouraging residents to make the smart and safe decision to properly dispose of their unwanted items. By creating awareness around the desired behaviour, we hope to encourage and foster improved environmental behaviour in the region.

The overall objectives were to increase awareness of the impacts that random dumping has on the environment and taxes; educate residents on appropriate proper disposal methods for waste materials; and, increase participation in choice behaviour of disposing materials appropriately.

Overall campaign components consisted of community outreach, Junk It Kit distribution, a social media campaign and paid advertising.

Holiday Campaign

Every holiday season, we launch the “Remember the 3Rs this Holiday Season” campaign to remind residents to make the 3Rs part of their holiday actions. Since 2011, in partnership with Metro Vancouver, the “Creating Memories, Not Garbage” campaign has been delivered to capital region residents. The purpose of the campaign is to engage and inspire residents to celebrate the holidays without creating unnecessary waste that will end up at Hartland landfill.

Diversion by Program (TONNES)

Program	Newspaper	Mixed Paper	Cardboard	Mixed Fibres ¹	Glass Containers	Metal Containers	Plastic Containers	Mixed Containers ²	Asphalt Shingles	Batteries	Books	Electronics	Food Waste
Blue Box & Bag Curbside Recycling/Organics Diversion													
Saanich				4,562				1,817					28
Victoria				1,872				785					1,694
Oak Bay				943				320					189
Esquimalt				630				259					
Central Saanich				1,002				393					
Langford				1,050				413					
North Saanich				641				255					
Colwood				704				277					
Sidney				384				153					
Sooke				457				180					
View Royal				301				129					274
Metchosin				249				98					
Highlands				106				42					
Juan de Fuca EA				346				136					
Total				13,247				5,257					2,185
Other Recycling													
Apartment Containers								233					
Oak Bay Recycling Depot		139	102				28						
Total		139	102				28	233					
Hartland Recycling Operations													
Recycling Depot		125	132					36	803		42	293	
HHW										40			
Total		125	132					36	803	40	42	293	
Electoral Area Recycling Depots													
Salt Spring Island		211	133		138	42	62			3		55	19
Pender Island		44	40		7					1		7	
Mayne Island		36	19		5	4	7			1		6	
Galiano Island		30	25		34	1	10					3	
Saturna Island	1	8	9		2	3							
Port Renfrew				18				8					
Total	1	329	226	18	186	50	79	8		5		71	19
GRAND TOTAL	1	593	460	13,265	186	50	107	5,534	803	45	42	364	2,204

¹ Includes newspaper, cardboard and mixed paper

² Includes metal cans, glass bottles and jars and plastic containers and packaging

³ Product Care includes paint at all depots, pesticides/solvents and fluorescents/CFLs at Hartland and Salt Spring depots.

⁴ Includes: cooking oil and reusable goods at Hartland, milk cartons on Salt Spring; deposit containers on Pender; deposit and polycoated containers on Mayne

HHW Orphans	Mattresses	Metals	Metal Appliances	Motor Oil, Filters, Containers & AF	Plastic (large rigid)	Plastic Film	Product Care ³	Propane Tanks & Fire Exting.	Styrofoam	Tires	Toilets	Wood Waste	Yard Waste	Miscellaneous ⁴	Total
															6,407
															4,351
															1,452
															889
															1,395
															1,463
															896
															981
															537
															637
															704
															347
															148
															482
															20,689
															233
						7									276
						7									509
	189	591	131		142	7				43	7	1,432	620	10	4,603
63				36			166	20	20					2	347
63	189	591	131	36	142	7	166	20	20	43	7	1,432	620	12	4,950
		38				8	26		7	8				8	758
		43			16	4	4			1				36	203
				1		3	6							38	126
		32				4				3					142
															23
		62													88
		175		1	16	19	36		7	12				82	1,340
63	189	766	131	37	158	33	202	20	27	55	7	1,432	620	94	27,488

Compost Education Centre



The Greater Victoria Compost Education Centre (GVCEC) was established in 1992 to educate local residents about composting and conservation. Under contract to the CRD, the GVCEC annually offers presentations, workshops, educational compost demonstrations, volunteer training, quarterly newsletter and maintains the GVCEC Hotline and website.

In 2013, The Greater Victoria Compost Education Centre changed their name to the Compost Education Centre (CEC) to reflect that they serve as a resource to people beyond the Greater Victoria area, covering the entire Capital Regional District. A new logo and website was designed to emphasize education on organic gardening, urban agriculture, and compost and conservation practices. In 2013, the CEC delivered 86 school presentations to over 2,300 children from pre-school to grade 12, and facilitated 64 community workshops on topics from Grow Your Own Food 101, to Soil Building and Backyard Beekeeping. Over 15,000 CRD residents visited the CEC's demonstration site or participated in one of its 40 educational community events and compost demonstrations. The CEC hosted five core community events in 2013, including a spring and fall organic plant sale, the 10th anniversary of their popular Pumpkin Smash in November and two Green Cone food waste digester subsidized sale and educational days in June, in partnership with the CRD. The CEC reached a total of 124,632 residents in 2013 through all avenues of their educational mandate, an increase of 112% from 2012! Since 1992, the CEC has made over 581,681 contacts with CRD residents.

Community Clean-Up Funding

The CRD Community Clean-up program financially supports non-profit groups that make visible environmental improvements to their community through organized clean-ups. In 2013, the CRD provided funding to eight non-profit groups. This funding provided support in the areas of:

- 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.

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. Seven organizations received funding in 2013.

Hartland Reusable Materials Program

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

Recycle

Recycling Programs

Curbside/Depot/Apartment Recycling

CRD residential recycling programs consist of the blue box curbside collection program, a funding program for recyclables collection from multi-family dwellings (apartment program), and funding for depots in areas not serviced by the curbside program.

In 2013:

- 21,557 households were serviced in the blue box curbside program
- 11,458 households on Salt Spring Island and the other Southern Gulf Islands were serviced in the depot program
- 1,042 apartment buildings participated in the funding program
- 10,892 blue boxes and 21,793 blue bags were distributed to residents
- 39,610 apartment recycling tote bags distributed since 2006

The CRD apartment recycling program offers funding to residential buildings that have five or more units. The funding is intended to supplement the costs of recycling so that it is equitable with the service provided to single-family homes on the curbside blue box program.

In an effort to improve recycling behaviours in multi-family dwellings, the CRD, in partnership with the Carton Council of Canada, conducted an apartment recycling pilot project in 2013. The campaign consisted of recycling and waste audits and engagement and education campaigns.

2013 Achievements

- Conducted 55 Hartland school tours
- Delivered 80 school program presentations and workshops
- Delivered 16 community presentations and 25 community tours
- Provided waste reduction messaging at 35 community displays
- Provided event recycling bins at 33 community events
- Received 55,000 Hotline enquiries



Front end section of Hartland landfill and recycling facility.

Hartland Public Drop-Off Area

The public drop-off area at Hartland receives garbage, recyclables and household hazardous waste. Over 80 items from 25 product categories are accepted for recycling. This area is intended for residential quantities only for vehicles with a maximum GVW of 5,500 kg.

New stewardship programs added in 2012 included outdoor power equipment, exercise equipment, power tools, light fixtures, video gaming equipment, musical instruments and medical devices. Other new initiatives included permanent collection and recycling programs for mattresses and box springs, asphalt shingles, and polycoated cartons following successful pilot programs for these items. Film plastic, Styrofoam and electronic toys continue to be collected as pilot studies.

Recycling Rates:

- \$107/tonne for wood waste and mattresses
- \$57/tonne for yard and garden material
- \$6 gate fee for recycling area (residents)
- \$26 gate fee for recycling area (small commercial loads)
- No charge for product stewardship materials
- No charge for household hazardous waste

Additional charges include a \$10 fee for general refuse deposited in the transfer bin and \$20 for appliances containing refrigerants.

Extended Producer Responsibility Programs

British Columbia's industry-led product stewardship programs require producers of designated products to take Extended Producer Responsibility (EPR) 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

Glass, plastic, aluminum, tin and metal beverage containers are accepted in the curbside blue box recycling and apartment recycling programs, as well as at the Hartland recycling facility and Southern Gulf Island recycling depots. Polycoated cartons (drinking boxes) were added to these programs in 2012. Beverage bags and pouches are not included in CRD programs.

Electronics, Electrical Products, Batteries and Lighting Products

In 2013, the CRD partnered with seven stewardship agencies for the collection of electrical items at the Hartland recycling facility:

- Encorp Pacific (computers, monitors, printers, TVs, audio visual, toys)
- 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)

The CRD received an ElectroRecycle Civic Award in 2013 for its commitment to small appliance and power tool recycling in the region.

Lead-Acid Batteries

Lead-acid batteries have been accepted at the Hartland recycling facility 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 and Flammable Liquids, Gasoline and Pesticides

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

PCA paint depots in the region:

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

Pharmaceuticals

The pharmaceutical EPR Medications Return Program is promoted regionally through the CRD Hotline, CRD website and MyRecyclopedia.ca, as well as in CRD Source Control messaging. In 2013, the CRD partnered with the Medications Return Program and Island Health to raise awareness about safe and proper disposal of medications, specifically working with home care providers.

Packaging and Printed Paper

In May 2011, the BC Recycling Regulation was amended to add packaging and printed paper (PPP) from residential generators. The amendment shifts the financial responsibility for managing these materials from local governments to producers as of May 2014. PPP includes all materials currently collected in the blue box recycling program. Additional materials such as Styrofoam and plastic bags will be accepted at depots.

Producers of PPP have formed a not-for-profit stewardship agency called Multi Material BC (MMBC) to manage and fund the collection and processing of these materials on their behalf. In 2013, the Capital Regional District entered into agreements with MMBC to provide curbside and depot collection services for PPP from May 2014 to April 2015.

Tires

Tires have been accepted at Hartland recycling since the depot 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 an EPR program under the BC Recycling Regulation managed by Tire Stewardship



Toys collected at Hartland under the stewardship program.

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 Hartland 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

Since 2007, over 4,000 residents in the District of Oak Bay and Town of View Royal have been separating their kitchen scraps from their garbage. This program, which originally began as a CRD pilot, involves curbside collection of kitchen scraps, which together with curbside recycling and yard and garden material programs, has these residents diverting upwards of 75% of their household waste from the landfill.



Options for diversion of kitchen scraps, from the residential sector were explored in 2010. Extensive consultation with the business sector was conducted in 2011.



Staff educating residents at a Digester Distribution event in the WestShore.

In April 2012, the CRD Board voted to implement a region-wide kitchen scraps strategy starting in 2013. Kitchen scraps include meat, bones, grains, dairy products, eggs, vegetables, fruits and soiled paper products.

The initial phase of the strategy includes a \$20/tonne incentive, in 2013 and 2014, for waste haulers who deliver separate kitchen scraps loads to CRD-approved transfer stations and composting facilities. In 2013, 7,700 tonnes of kitchen scraps were diverted from Hartland landfill through the incentive. The 20% surcharge component of the strategy was delayed. In the final phase of the strategy, the CRD will implement a ban on kitchen scraps from Hartland landfill starting January 1, 2015.

The kitchen scraps collection program will save landfill airspace and help to ensure that the CRD meets its diversion goals. Regional greenhouse gas emissions that contribute to climate change will also be reduced. In addition, kitchen scraps processing will create a valuable resource, such as compost and/or biogas. It is estimated that 30,000 tonnes of processed kitchen scraps would generate approximately 17,000 tonnes of finished compost.

Compost Facilities Bylaw

The CRD Board adopted the regional composting bylaw in December 2005. The bylaw came into effect immediately for new facilities and 12 months afterwards for existing facilities. The bylaw regulates the operation of composting facilities to protect public health and the environment. There are currently no approved facilities in the region.

Financial Management

Revenues	
Tipping Fees (including Kitchen Scraps)	\$15,373,443
Recycling Program Revenues	\$294,823
Power Plant	\$288,883
Permits, Fines & Misc	\$165,077
EPR Programs	\$139,461
TOTAL	\$16,261,687
Costs	
Recycling Collection Programs	\$5,869,811
Landfill Operations	\$5,604,940
Capital Spending	\$4,805,000
Closure & Post-Closure Fund	\$817,117
Household Hazardous Waste	\$758,035
Hartland Recycling	\$655,720
Debt Charges	\$646,385
SW Initiatives & Enforcement	\$639,788
Planning	\$449,984
Kitchen Scraps (hauling and processing)	\$460,300
Community Support Programs	\$410,025
Equipment Fund	\$328,708
Power Plant Costs	\$85,174
TOTAL	\$21,530,987
Surplus (Deficit)	\$(5,269,300)

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. This form of financing has practical limits as diversion increases and landfill volumes decline. The 2013 deficit can be covered from a sustainability reserve fund that was established in 1998; however, it is anticipated that the fund will be exhausted by 2017. Long term financial sustainability of the CRD solid waste function will form a critical part of the new Integrated Solid Waste and Resource Management Plan.

Yard & Garden Material Landfill Restriction

A number of private facilities in the area accept the region's yard and garden material. In June 2006, a yard and garden material landfill ban came into effect. The ban excludes invasive, infectious and noxious plants. Source-separated yard and garden material is accepted for a fee at Hartland, where it is ground and used on-site. In 2013, 620 tonnes of material was received.

Household Hazardous Waste

In 2005, the number of items collected at the Hartland recycling facility was expanded to include non-stewardship household hazardous wastes. This expansion provided the region's residents with a "one-stop" drop for virtually all of their Household Hazardous Waste (HHW) and is the only 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 Hazardous Waste facility.

Salt Spring and the Southern Gulf islands are serviced by means of mobile HHW collection events held on the islands. Initial events were conducted on these five islands during 2006/2007, with subsequent events scheduled for every two years. In 2013, HHW collection events were held on Galiano, Mayne and Saturna Islands.

Household Hazardous Waste mobile collection event on Mayne Island.





Hartland Gas Utilization Facility.

Recovery

Hartland Gas Utilization Facility

The gas utilization facility currently produces about 1.6 megawatts of “green” electricity, which is enough to supply power to approximately 1,600 homes. The CRD hopes to optimize landfill gas production with a 75% capture rate by 2016.

In 2013, the CRD purchased Maxim Power Corporation’s portion of the power project, which gives the CRD full control over the landfill gas. In addition to landfill gas recovery, staff are continually investigating other resource recovery opportunities.

Residual

Hartland landfill is a state-of-the-art, award-winning facility receiving the Silver Landfill Management Excellence Award from the Solid Waste Association of North America in 2005, as well as other awards for leadership and innovation in gas utilization and best practices for household hazardous waste collection. The CRD received four awards in 2010 for its safety initiatives, including the prestigious National Award for Best Safety Week Program in Canada, in which Hartland landfill played a major role. In 2011, Hartland was recognized with the Leader in Sustainability, Top 100 Participants in Canada award from Call2Recycle.

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 landfill tipping fee structure for 2013 included:

- \$107/tonne for general refuse
- \$152/tonne for controlled waste
- \$247/tonne for bulky waste

Residential User Pay Garbage Collection

The six municipalities in the region that offer residential garbage collection utilize a user pay system. This system limits the amount of refuse each household may place out for collection to the equivalent of one can/bag per week. Additional cans or bags are only collected if residents purchase and attach garbage tags. Households using private garbage collection services are on a full user-pay system.

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 drywall (1991); corrugated cardboard, white goods, tires, directories (1993); scrap metal, aggregate, concrete, asphalt, rubble, clean soil (1995); paper fibres (1998); yard and garden waste (2006); and product stewardship materials (2011).

Capital Works

Each year, on average \$2 million is spent on capital works towards installation of environmental controls and general site improvements. Typical works include building site access roads, installing leachate and gas collection systems, stormwater management system and interim and final covers.

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 2040, at which time it will have reached its current design capacity. All capital works are planned with the overarching aim of maximizing landfill life.



Truck moving rock in Phase 2 of Hartland landfill.

Following are achievements for 2013:

- Installation of new horizontal gas wells and leachate collectors in the east half of the 171m landfilling lift and commissioning of five horizontal wells to increase gas collection efficiency.
- Environmental Engineering oversees the landfill contractor's contract.
- Environmental Engineering worked with Seattera on the development of the Hartland North pad for the Resource Recovery Centre.
- Vision casting with Environmental Resource Management for Hartland 2100 (vertical expansion of landfill).

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, Big Leaf Maple and Red Alder, as well as ocean spray, indian plum and mock orange (all of which are native to the area). Phase 1, 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.

In 2008, Hartland landfill received a \$50,000 Trees for Tomorrow grant to plant thousands of native trees, seedlings and bushes over top of the first phase of the landfill, which was filled to capacity in 1997 and closed. Phase 1 of the landfill has been capped and sealed with a plastic liner and layer of soil, allowing vegetation to grow as a top cover. Because landfill areas can settle and shift over time, a green space or a park is an ideal end use for a closed landfill. Over 22,000 trees and bushes have been planted over Phase 1 of Hartland landfill.

Trees for Tomorrow is a provincial program funded by the Ministry of Community Development and designed to support urban and rural communities in the planting of over four million trees by 2012, which has been met. The goal of the program is to reduce greenhouse gases in the atmosphere by at least 33% below current levels by 2020. New trees will clean the air and lock away carbon dioxide that would otherwise contribute to global warming.

Leachate Management

Leachate is liquid that is produced from decomposing refuse and includes any precipitation that comes in contact with the refuse. To minimize the leachate generation area, impermeable covers have been installed on the southwest and northwest faces of the landfill and perimeter ditches are lined to divert more clean surface water away from the landfill. In 2011, the Cell 1 Final Closure was completed and the 3.5 hectare final (impermeable) cover was installed. This has reduced the total leachate generation area from more than 20.5 to 17.5 hectares.

Environmental Monitoring

The operation of a landfill can result in potential environmental effects and health and safety issues, specifically to surface water and groundwater, and the production of landfill leachate and landfill gas. Hartland landfill uses a number of control measures to prevent or reduce effects on groundwater, surface water and air. An environmental monitoring, assessment and management program is in place to measure the effectiveness of these control measures, and to identify potential impacts of landfill operations and solutions.



Environmental monitoring near Hartland landfill.

In 2013, landfill gas monitoring confirmed that the landfill gas collection system worked effectively to control emissions from Phase 1. Additionally, new gas wells installed in Phase 2, as part of a long-term gas management plan, resulted collection efficiency. Water quality monitoring indicated that landfill leachate is effectively contained and controlled on site. Leachate quality monitoring confirmed that leachate discharged from the site was generally in compliance with CRD's Sewer Use Bylaw, which regulates discharges to the sanitary sewer. Surface water issues associated with runoff from aggregate stockpiled on the Hartland North site continue to improve as a result of the cover installed on the stockpile and continual reduction of stockpile size.

2013 Summary

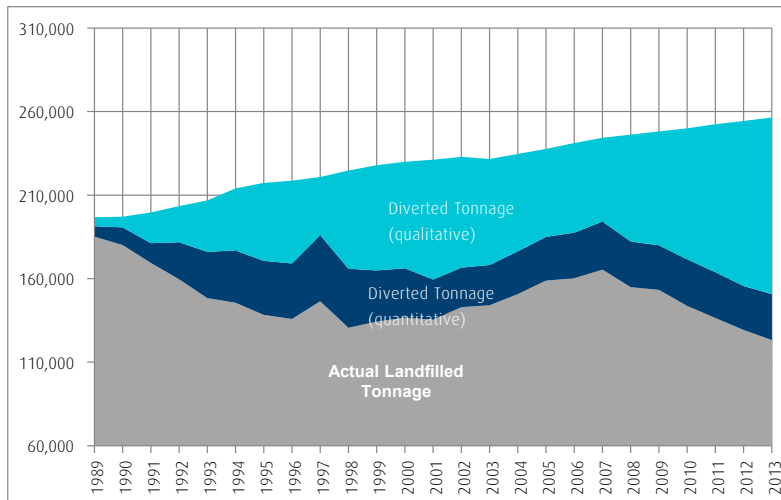
Environmental resource management in the Capital Region consists of a complex and mature materials management system that is constantly evolving. The Environmental Resource Management division uses its mandate to educate, facilitate and regulate to help minimize waste and maximize resources. A number of successful programs have been implemented over the years that have resulted in a diversion rate of 52%.

Total Refuse by Type

Type of Waste Declared	2012 Annual Total (tonnes)	2013 Annual Total (tonnes)	% Change from 2012
General Refuse	129,279	123,210	-5%
<u>Controlled Waste</u>			
Miscellaneous	678	735	8%
Liquid Waste	721	676	-6%
Asbestos	1,417	1,711	21%
Screenings	4,668	5,086	9%
Sub-Total	7,484	8,208	10%
Total	136,763	131,418	-4%

- Miscellaneous includes food processing, surface coating and health hazard wastes, fibre optic cable, spoiled food, animal feces, dead animals, contaminated drywall and soot
- Liquid waste includes pumpings from catch basins, car wash sumps and other sumps containing non-hazardous waste
- Asbestos also includes material from outside of region

Solid Waste Diversion



Qualitative diversion is a result of unmeasurable CRD programs as well as private sector activities.

Diversion Rates (1989-2013)

Year	CRD Population ¹	Projected Tonnage ²	Actual Landfilled Tonnage	Diverted Tonnage ³ (quantitative)	Diverted Tonnage ⁴ (qualitative)	Diversion Per Capita (tonnes)	Diversion Rate
1989	284,730	196,763	185,128	6,243	5,392	0.041	6%
1990	291,880	197,076	180,118	10,549	6,409	0.058	9%
1991	299,133	199,608	169,419	11,809	18,380	0.101	15%
1992	304,200	203,416	159,634	22,134	21,648	0.144	22%
1993	308,720	206,826	148,341	27,700	30,785	0.189	28%
1994	321,585	214,017	145,585	31,263	37,169	0.213	32%
1995	326,010	217,310	138,303	32,342	46,665	0.242	36%
1996	328,880	218,643	135,869	33,190	49,584	0.252	38%
1997	329,135	220,850	146,442	39,634	34,774	0.226	34%
1998	334,871	224,698	130,604	35,310	58,784	0.281	42%
1999	339,643	227,900	134,257	30,643	63,000	0.276	41%
2000	342,718	229,964	136,654	29,537	63,773	0.272	41%
2001	344,567	231,204	135,425	24,010	71,769	0.278	41%
2002	347,095	232,901	142,940	23,636	66,325	0.259	39%
2003	345,223	231,645	144,043	24,116	63,486	0.254	38%
2004	349,638	234,607	150,787	25,580	58,240	0.240	36%
2005	354,206	237,672	158,848	26,132	52,692	0.223	33%
2006	359,439	241,184	160,260	27,261	53,663	0.225	34%
2007	364,121	244,325	165,381	28,802	50,142	0.217	32%
2008	366,934	246,213	154,881	27,315	64,017	0.249	37%
2009	369,791	248,130	153,263	26,674	68,193	0.257	38%
2010	372,565	249,991	143,669	27,874	78,448	0.285	43%
2011	376,222	252,445	136,414	27,388	88,643	0.308	46%
2012	373,709	250,759	129,279	26,269	95,211	0.325	48%
2013	382,252	256,491	123,210	27,493	105,788	0.349	52%

¹ Population data provided by CRD Regional Planning Services

² Projected annual waste based upon the 1989 waste generation rate of 0.671 tonnes per capita

³ Diversion tonnage as per Table 2

⁴ Qualitative tonnage diverted = actual material landfilled at Hartland - quantitative tonnage diverted

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