

**REGIONAL DISTRICT OF NANAIMO
REGIONAL SOLID WASTE ADVISORY COMMITTEE MEETING**

**THURSDAY, NOVEMBER 26, 2015, 5:00 PM - 7:30 PM
RDN Board Chambers**

A G E N D A

PAGES

CALL TO ORDER

DELEGATIONS

Larissa Coser, Zero Waste Nanaimo (20 mins)

MINUTES

3-6 Minutes of the Regional Solid Waste Advisory Committee meeting held Nov. 5, 2015.

BUSINESS ARISING FROM THE MINUTES

COMMUNICATIONS/CORRESPONDENCE

7-12 NextUse Presentation to RDN Letter July 2015.

13-16 Residual Management Scope of Work Staff Report Nov. 2015.

17- 25 Solid Waste Management Plan Community Consultation Summary Report.

UNFINISHED BUSINESS

REPORTS

26-30 Technical Memorandum: Share Shed Programs at Regional District of Nanaimo Solid Waste Facilities. (S. Horsburgh – Presentation)

31-41 Technical Memorandum: EPR Materials at Regional District of Nanaimo Solid Waste Facilities. (M. Larson - Presentation)

ADDENDUM

SOLID WASTE MANAGEMENT SELECT COMMITTEE MEETING MINUTES

BUSINESS ARISING FROM DELEGATIONS OR COMMUNICATIONS

NEW BUSINESS

ADJOURNMENT

Distribution:

Alec McPherson	Chair, RDN Director	Michael Recalma	Qualicum First Nation
Jim Kipp	Deputy Chair	Chief & Council	Nanoose First Nation
Frank Van Eynde	Member at Large	Chief & Council	Snuneymuxw First Nation
Derek Haarsma	Business Representative	John Marsh	Town of Qualicum Beach
Ed Walsh	Waste Management Industry	Fred Spears	District of Lantzville
Wally Wells	Business Representative	Charlotte Davis	City of Nanaimo
Jan Hastings	Non Profit Representative	Al Leuschen	Ministry of Environment
Jim McTaggart-Cowan	Member at Large	Karen Muttersbach	Environment Canada
John Finnie	Member at Large	Glenn Gibson	Island Health
Craig Evans	Member at Large		
Ellen Ross	Member at Large		
Gerald Johnson	Member at Large		
Michele Green	Member at Large		
Amanda Ticknor	Member at Large		
Michael Tripp	Business Representative		
Stewart Young Jr.	Business Representative		
Larissa Coser	Community Representative		

RDN Staff:

Larry Gardner	Manager, Solid Waste Services, RDN
Sharon Horsburgh	Senior Solid Waste Planner, RDN
Dennis Trudeau	GM Transportation & Solid Waste Services, RDN
Meghan Larson	Special Projects Coordinator
Jeff Ainge	Zero Waste Coordinator, RDN
Rebecca Graves	Recording Secretary, RDN

For information only:

Regional Board Members: CAO's: Paul Thorkelsson (RDN), Brad McRae (District of Lantzville), Fred Manson (City of Parksville), Daniel Sailland (Town of Qualicum Beach), Tracy Samba (City of Nanaimo)

**REGIONAL DISTRICT OF NANAIMO
REGIONAL SOLID WASTE ADVISORY COMMITTEE MEETING
HELD ON THURSDAY, NOVEMBER 5, 2015
BOARD CHAMBERS**

Present:

Alec McPherson	Chair, RDN Director
Craig Evans	Member at Large
John Finnie	Member at Large
Gerald Johnson	Member at Large
Frank Van Eynde	Member at Large
Ellen Ross	Member at Large
Amanda Ticknor	Member at Large
Jim McTaggart-Cowan	Member at Large
Michele Green	Member at Large
Larissa Coser	Community Representative
Derek Haarsma	Business Representative
Jan Hastings	Non Profit Representative
Charlotte Davis	City of Nanaimo

Also in Attendance:

Larry Gardner	Manager of Solid Waste, RDN
Rebecca Graves	Recording Secretary, RDN
Sharon Horsburgh	Senior Solid Waste Planner, RDN
Meghan Larson	Special Projects Coordinator, RDN
Jeff Ainge	Zero Waste Coordinator

Regrets:

Dennis Trudeau	GM, Transportation & Solid Waste Services, RDN
Chief & Council	Nanoose First Nation
Chief & Council	Snuneymuxw First Nation
Glenn Gibson	Island Heath
Al Leuschen	Ministry of Environment
Karen Muttersbach	Environment Canada
Michael Recalma	Qualicum First Nation
Fred Spears	District of Lantzville
Jim Kipp	RDN Director, Deputy Chair
Michael Tripp	Business Representative
Wally Wells	Business Representative
Stewart Young Jr.	Business Representative
John Marsh	Town of Qualicum Beach
Ed Walsh	Waste Management Industry

CALL TO ORDER

The Chairperson called the meeting to order at 5:07 PM.

DELEGATES

MINUTES

MOVED F. Van Eynde, SECONDED G. Johnson, that the minutes from the meeting of the Regional Solid Waste Advisory Committee regular meeting held Sept. 17, 2015, be adopted. CARRIED

BUSINESS ARISING FROM THE MINUTES

COMMUNICATIONS/CORRESPONDENCE

Letter from NextUse Recycling Ltd. dated October 27, 2015 re. Mixed Waste Recovery Facility.

MOVED G. Johnson, SECONDED F. Van Eynde, that the correspondence from NextUse Recycling Ltd. dated October 27, 2015 regarding a Mixed Waste Recovery Facility be received.

CARRIED

SWANA Article re. A Comparative Analysis of Source-Separation and Mixed Waste Recycling Systems in Charlotte, NC, and Montgomery, AL.

MOVED G. Johnson, SECONDED F. Van Eynde, that the article from SWANA regarding *A Comparative Analysis of Source-Separation and Mixed Waste Recycling Systems in Charlotte, NC, and Montgomery, AL.* be received.

CARRIED

UNFINISHED BUSINESS

S. Horsburgh introduced a decision making tool (DMT) which is an online audience polling tool that engages the public's interest and allows for participant anonymity. After each presentation a discussion on the topic will occur and then vote using the DMT

REPORTS

Curbside Collection Program – Compliance and Enforcement to Improve Diversion. (J. Ainge)

J. Ainge gave a presentation on the Compliance and Enforcement report on possible opportunities to improve diversion rates through the existing curbside collection programs. The residential sector contributes the smallest amount of waste to landfill at 17%. Households receiving curbside collection service throughout the region are achieving a 60% diversion rate through their participation in the curbside recycling and food waste collection programs. Despite this laudable achievement, compostable organic waste still enters the waste stream.

Options to improve curbside compliance and participation in diversion programs include targeted outreach and education activities focusing on organics and other recyclable materials, extending the organics disposal ban to include food waste from residential sources

It was noted that focusing efforts on the commercial sector, along with the multi-family housing sector is likely to have greater impact than targeting curbside collection.

A group discussion followed and there was strong support for enforcement of recycling in multi-family dwellings (MFD). It was clarified that the DMT was only to consider residential collection and the result showed a slight preference to transition to more enforcement acceptable waste types set out at curb (i.e. proper separation of waste, organics and recyclables)

The DMT showed 62% favour in transitioning to more enforcement.

Curbside Collection Program – Household Glass Collection. (M. Larson)

M. Larson provided a presentation on the Household Glass Collection report which included a brief history of glass collection in the RDN and options for curbside glass collection.

Household glass containers have not been accepted as part of curbside recycling for several years in this region, and staff are not aware of any glass processors located in the Province who are capable of taking glass and making new glass containers. In 2009, an analysis of the RDN's curbside materials estimated glass containers made up about 5% of the overall recyclables set out for collection. With the advent of the Province's packaging and printed paper stewardship program, operated by the stewardship agency MMBC, household glass containers are considered packaging. Glass containers are accepted at no charge at six depots throughout the region that get paid by MMBC to handle the material.

A change to the curbside recycling collection programs operated by the CoN and RDN would require approval from MMBC, as well as contract changes for the curbside collection contractor. The CoN is contemplating service level options as a new collection system is phased in; this could include glass collection for their customers.

There is limited diversion impact in reinstating glass to the curbside recycling, and any change will come with costs (i.e., two collection trucks estimated at \$190,000/year to serve the RDN curbside routes). Glass collection can be included in contract renewal discussions with the collection contractor and MMBC when the time comes, however no immediate changes as part of the SWMP action items are foreseen.

A group discussion followed and the DMT polling results showed 38% favoured the inclusion of glass in the in the curbside collection program.

Curbside Collection Program – Yard Waste Collection. (S. Horsburgh)

S. Horsburgh gave a presentation on the current yard waste management practices; determine if there is an opportunity to add yard waste collection to the curbside program and to calculate diversion benefits.

Support for introducing curbside yard waste collection hovers around 40 to 60% based on surveys completed in the region over recent years. That support drops when respondents are asked about their willingness to pay for such a service. Even without curbside collection, approximately 12,000 tonnes of yard waste is diverted from disposal each year due to residents' use of yard waste drop-off facilities coupled with backyard composting activity. Compare this with less than 3,000 tonnes estimated to enter the landfill, of which only an estimated 225 tonnes is attributed to curbside sources.

The City of Nanaimo reports their intention to conduct public engagement in Fall/Winter of 2015. With the introduction of automated collection in Nanaimo, Council has asked staff to review the appetite of City residents for collection of Yard Waste. Staff and Council in Nanaimo regularly hear from residents that they wish to receive collection of Yard Waste, the question remains as to how much they are willing to pay. At a Council meeting in June 2015 City staff reported to Council that, of the 15 largest Cities in BC (of which Nanaimo is ninth), nine of them collected yard waste. City staff also noted as part of this report that the average user rate of the 15 largest municipalities in BC is \$197 per household per year, compared to the City rate of \$99.75 per year.

Based on the 2012 waste composition study and data from facilities handling this material, roughly 80% of yard waste generated in the RDN is already diverted from landfill disposal. The collection of yard waste at the curb will not contribute significantly to the region's diversion goals, but the impression is that such a service will provide a much higher level of convenience for the resident generating the waste.

Curbside collection of yard waste is likely to reduce greenhouse gas emissions by reducing vehicle trips to the receiving facilities, but compulsory collection could also result in more yard waste being captured since residents would be paying for the service whether they used it or not. The most significant contribution to the region's sustainability goals associated with the introduction of curbside yard waste collection would be the rationale to extend backyard burning bans to more areas in the RDN.

A group discussion followed and the results from DMT polling indicated 23% supported including yard waste at curbside 23% were unsure of whether it should be included in the program.

ADDENDUM

SOLID WASTE MANAGEMENT SELECT COMMITTEE MEETING MINUTES

MOVED G. Johnson, SECONDED J. McTaggart-Cowan, that the minutes from the meeting of the Solid Waste Select Committee meeting held October 7, 2015, be adopted. CARRIED

NEW BUSINESS

Next RSWAC meeting will be held November 26, 2015.

ADJOURNMENT

MOVED J. McTaggart-Cowan, SECONDED G. Johnson, that this meeting be adjourned.

CHAIRPERSON



July 16, 2015

Chair, RDN Director Alec McPherson
Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2

Dear Mr. Alec McPherson,

Re: Mixed Waste Material Recovery Facility Presentation to RDN

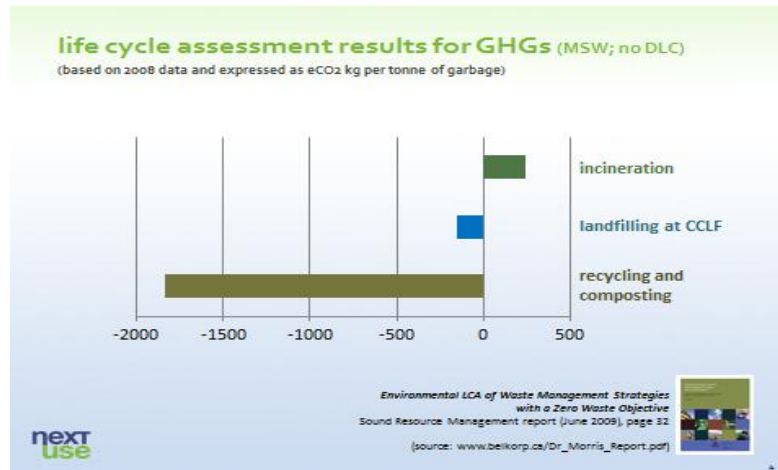
Thank you for the opportunity to appear as a delegation at the Regional Solid Waste Advisory Committee (RSWAC) meeting on May 28, 2015.

The objective of our presentation was to demonstrate how mixed waste material recovery facilities (MRFs) can be integrated into solid waste management systems to increase diversion rates and to support progress towards zero waste. In brief, this would entail:

- maximizing source separation to the fullest practical extent
- employing advanced MRFs to remove and divert recyclables and organics from the waste stream – providing one last pass prior to disposal.

The following provides a summary of the presentation for your records.

In June 2009, Dr. Jeffrey Morris of Sound Resource Management Group, completed a report commissioned by Belcorp Environmental Services Inc., showing that the benefits of recycling and composting – from a climate change, human health, and ecosystem health perspective – far exceed any form of waste disposal either through incineration or landfilling. This is depicted from a greenhouse gas perspective in the graphic below.



The historical (spoon versus fork) debate in solid waste has primarily centered on two options: (i) burning the bag for energy (and burying the ashes) or (ii) burying the bag in a landfill. What has emerged as a strong contender to these disposal options is the notion of breaking the bag to pull out the last remaining recyclable materials before sending the remaining (inert) residual to landfill.

Breaking the bag is called mixed waste materials recovery and has caught entities like Metro Vancouver by surprise. They never evaluated advances in mixed waste processing and only looked at facilities that employed older technology to remove organics for composting before recombining the organics with the remaining waste stream and landfilling. This is called mechanical biological treatment. Ironically this antiquated practice ranked highest from a greenhouse gas reduction perspective in Metro's reported analysis.

70% or 80%, what about breaking the bag to get more!

burn
bury
break

- increase recovery before disposal
- conserve embodied energy (recycling)
- upstream off-sets
- bury inert material (near zero GHG and leachate)

The technological advances in mixed waste processing are in part a result of the advances that have allowed recyclables to be combined in one tote rather than separate boxes – this is called single stream recycling. The ability to optically sort has eliminated the need for manually picking from a conveyor belt and has greatly improved processing rates and efficiencies. Other advances include better screens, air drum separators, and x-ray sorters. All of these technologies have been integrated into the next generation of application – mixed waste processing.

Mixed waste processing is not without its detractors. There are some that believe the only way to recycle is to have single family, multi family, and commercial businesses separate everything at source.

However, as shown in the adjacent figure, after decades of recycling initiatives there clearly remain significant challenges. These challenges lie primarily in the practical limitations in what can be achieved through bylaws requiring the separation of recyclables at the generating source. The most notable limitation is the degree of enforcement that would be required to achieve higher rates of recycling at the



generating source. This level of enforcement would not be popular with residents and businesses and would be very costly. So would the notion of imposing a tax to discourage waste as suggested at the May 28th RSWAC meeting. Without heavy handed enforcement or the introduction of an unpopular tax, it would be difficult, if not impossible, to achieve the high diversion rates through public education alone.

With the introduction of Extended Producer Responsibility (EPR) programs, the playing field has shifted for regional and local governments. They now have the choice of handing over the responsibility and the costs of recycling programs to producers. In turn, producers, by provincial regulation, are required to provide collection and processing at no cost to the property owner. Under this construct,



the notion of mixed waste processing competing with EPR programs (whereby individuals can dispose of their recyclables for free) is highly unlikely to change well established recycling behaviours.

As illustrated in the adjacent figure, MRFs can't compete with free but they can provide a final screening of waste for the purposes of recycling, after all upstream attempts to divert (at the

generating source) have been exhausted. The NextUse Recycling Inc. (NextUse) mixed waste MRF proposed in the Tri-Cities area of Metro Vancouver will not undermine existing source separation programs. Rather, it is premised on retrieving and diverting the recyclables which will remain in the waste stream notwithstanding source separation efforts. The NextUse facility aims to work in concert with existing municipal recycling and composting programs, disposal bans, and provincial stewardship programs to drive toward the goal of zero waste.

There are hundreds of established material recovery facilities operating world-wide. As noted earlier, technological advances in this arena have allowed the crossover to mixed waste and more mixed waste applications are scheduled to come online, especially in California due in part to recent State Regulation (AB341). This Assembly Bill makes it mandatory for the state as a whole to achieve 75% waste diversion by 2020, and for commercial and multi-family wastes to either implement source separation or alternatively send their mixed wastes to a processing facility. The following table sets out examples of full scale mixed waste facilities in the US.

Mixed Waste MRFs	Location
Infinitus (IREP)	Montgomery, AL
Newby Island	San Jose, CA
Greenwaste Recovery	San Jose, CA
Athens Disposal	City of Industry, LA, CA
Athens Disposal	Sun Valley, LA, CA
Western Placer Waste Management Authority	Roseville, CA
Athens Disposal – Permitting Stage	City of Irwindale, CA
Santa Barbara County – Permitting Stage	Santa Barbara, CA
District of Monterey – August 2016	Monterey, CA
Waste Management (City of Oakland) – 2018	San Leandro, CA

To achieve the state diversion goal of 75% by 2020, the County of Santa Barbara, City of San Jose and District of Monterey are just a few examples of communities that have implemented (or are planning to implement) new MRF technologies as part of their integrated solid waste management systems to complement their existing source separation recycling programs.

The facilities in Sun Valley and San Jose, California, and Montgomery, Alabama in particular, best exemplify the evolution of modern MRFs. The recovered recyclables are not only a true testament of their performance and efficiencies, but also dispel the claims by competitors that the recyclables recovered by mixed waste processing can't be marketed because of contamination.

For plastics, the modern MRFs employ the use of the new technologies described above and have the ability to sort different plastic types with a high level of precision and accuracy. Moreover, irrespective of whether separated at source or in a mixed waste MRF, all plastics are industrial washed before they are granulated

or pelletized and shipped to manufacturers. As for paper fibre, the clean and dry material is recovered and recycled as mixed paper, while the wet and heavily soiled fibre is sent out with the compostable organic fraction – both of which count as diversion.

Based on the RDN's 2012 Waste Composition study detailed below, the paper, plastics, compostable organics, beverage containers, and metal that remains in the waste stream after the RDN has achieved 68% diversion through source separation represents 65% of the remaining 53,319 tonnes of residual currently disposed of at the Regional Landfill.

Material Category	Residential		ICI		Self-Haul		Waste Stream Summary	
	Comp (%)	Disposed (MT)	Comp (%)	Disposed (MT)	Comp (%)	Disposed (MT)	Comp (%)	Disposed (MT)
Recyclables								
Paper	1.2%	637	9.5%	5,049	1.8%	969	12.5%	6,655
Plastic	2.5%	1,313	8.3%	4,421	3.0%	1,599	13.8%	7,334
Compostable Organics	6.2%	3,301	26.0%	13,879	2.7%	1,453	34.9%	18,633
Beverage Containers	0.2%	98	1.3%	681	0.2%	86	1.6%	865
Metals	0.5%	260	1.2%	656	0.7%	375	2.4%	1,291
Recyclables Subtotal	11%	5,609	46%	24,687	8%	4,482	65%	34,778
Remaining Materials								
Textiles	1.1%	576	2.0%	1,080	2.5%	1,380	5.6%	3,037
Glass	0.5%	275	1.2%	611	0.9%	500	2.6%	1,386
Building Materials	0.7%	347	4.6%	2,438	5.3%	2,963	10.6%	5,748
Electronics	0.3%	144	1.9%	997	0.3%	182	2.5%	1,323
Household Hazardous	0.3%	135	2.3%	1,220	0.3%	162	2.9%	1,517
Household Hygiene	3.5%	1,829	3.1%	1,633	0.8%	470	7.4%	3,932
Other	0.3%	168	1.1%	572	1.4%	859	2.8%	1,599
Remaining Material Subtotal	7%	3,474	16%	8,552	12%	6,516	34%	18,542
Totals	17%	9,083	63%	33,239	20%	10,998	100%	53,319

NextUse projects 51% (27k tonnes) of the recyclables (including recoverable electronics and clean wood) and organic matter in the MSW waste stream can be recovered and diverted from final disposal. ***In conjunction with the current 68% diversion through source separation, the additional recyclables recovered would bring the overall diversion rate for the RDN from 68% to 84%.***

Additionally, a mixed waste MRF provides economic opportunities for the RDN by creating more jobs (versus disposal) with the cost to operate a mixed waste MRF largely offset by reduced landfill costs and the revenue from recyclables.

Reduced landfill costs are achieved through:

- consolidation of residual from the MRF to two to three 26 tonne loads per day
- reduction of landfill operating costs:
 - smaller tipping face and associated costs (i.e., fuel usage, equipment ownership, etc.)
 - less traffic and associated costs (i.e., scale house operation, traffic control, road repair, etc.)
 - reduced costs for acquiring and handling daily, intermediate, and final cover
 - less leachate generation from the inert residuals resulting in less costs to manage and less environmental risks.

Public pressure, greater environmental awareness and the proven application of emerging mixed waste MRF technology are shaping a new standard for best practices in sustainable waste management. The implementation of a MRF for a last pass to remove recyclables prior to final disposal would make the RDN a leader in waste diversion in Canada.

On a side note, in the Summary/Conclusion of the Overview of Multi Material Recycling Facility Technologies, circulated at the May 28, 2015 RSWAC meeting, a reference was made to mixed waste MRFs being excluded as an option in the Fraser Valley Regional District (FVRD) Solid Waste Management Plan due to public opposition. We would like to clarify that the opposition was to the proposed Aevitas hazardous waste recycling plant in Chilliwack, not the mixed waste MRF proposed by FVRD. The FVRD strongly supports and recognizes the important role mixed waste MRFs play in the overall integrated solid waste management system in achieving their goal of zero waste. In fact, the FVRD is in the process of pursuing a competitive staged process for a mixed waste MRF with a design capacity of 100,000 tonnes to service their region.

Please do not hesitate to contact me if you have any questions or require clarification.

Yours truly,



Russ. S. Black, MBA, P.Eng.
Vice President, Corporate Development

TO: Larry Gardner
Manager of Solid Waste

DATE: July 31, 2015

FROM: Sharon Horsburgh
Senior Solid Waste Planner

FILE: 5365-00

SUBJECT: Residual Management Assessment – Scope of Work

OBJECTIVE

The objective is to consider alternatives to landfilling within the Regional District of Nanaimo (RDN). This is a preliminary level assessment and should consider thermal systems, biological systems and waste to fuel. It is intended to assess cost/benefit at a high level to be used to eliminate non-viable options from further consideration or, to determine what criteria or thresholds might make a specific option viable. “Benefit” includes application of the 5R hierarchy to further advance zero waste.

DELIVERABLES

The final report should include, but not be limited to:

- The amount (i.e. percentage of the waste stream) of additional material that may be diverted for recycling as part of waste processing associated with the technology. Provide comments on the material types, expected quality, marketability and residual waste.
- The amount of material that would go to recovery (i.e. energy or fuel), existing or potential markets, expected value of the fuel and the amount of residual waste from the recovery process.
- Order of magnitude costs including capital, operating and maintenance.
- Consideration of a source separated waste stream under two scenarios (i.e. 70% and 80% diversion) as explained in more detail below.

BACKGROUND

The RDN is currently in Stage 2 of the Solid Waste Management Plan (SWMP) review process. Numerous options have been suggested for changes or improved services with respect to education, recycling, expanded curbside collection, regulatory activities and residual waste management. RDN staff is currently undertaking a high level assessment of each of the options which will be used to develop a short list of preferred options.

In regards to residual management, waste is currently landfill at the RDN’s Cedar Road Landfill. The landfill has a projected life of about 25 years. During the Stage 2 planning process, alternatives for residual waste management were introduced and included thermal systems, biological systems and waste to energy/fuel systems. The decision was to proceed with a high level assessment of each of these technologies to determine their viability in the RDN.

In discussing residual management options with the Regional Solid Waste Advisory Committee (RSWAC) continuation of source separation of waste is preferred over attempting to mechanically separate a mixed waste stream. The RDN currently relies on a three stream curbside collection system and material bans at the landfill (e.g. clean wood waste, commercial organics) to advance source separation. For the purpose of this study, source separation of waste is expected to continue in the RDN for the foreseeable future.

Waste Generation

Waste generation within the RDN has been forecast until 2025 and this report is available as attachment 1. A summary of the RDN's results are set out in the attached Technical Memo. The projections were extrapolated from information provided by BC Stats report titled *Solid Waste Generation in British Columbia, 2010-2025 Forecast, June 2012*. Waste generation projections in the RDN are forecasted as follows:

- At 70% diversion, residual waste in 2015 is expected to be 52,000 tonnes and increasing to 57,000 tonnes in 2025.
- At 80% diversion, residual waste in 2015 is expected to be 52,000 tonnes and decreasing to 36,000 tonnes in 2025.

Waste diversion in the RDN is currently at 68%. The 80% diversion scenario relies on improvements to the organics diversion programs with only a modest increase from provincial stewardship programs. This is because current RDN policies are believed to have largely achieved the same results of what is expected to be accomplished by the introduction of new provincial stewardship programs over this same period.

Organic Wastes

Source separated food waste and depot collected yard and garden is currently composted under contract to the RDN by Nanaimo Organics Waste (NOW). At the current time, the resulting compost has a low value primarily due to plastics contamination. The amounts of food and yard/garden waste processed and composted at NOW is 6,225 metric tonnes (M/T) of food waste and 7,900 m/t of yard waste respectively. Additionally, an estimated 1,000 tonnes of food waste generated in the region is composted at alternate sites in neighbouring jurisdictions.

Under the RDN's Waste Stream Management Licensing Bylaw 1386 several "for profit" waste management facilities have received licenses to process land clearing, wood waste and yard/garden waste these materials may be used for composting, soil blending and as a fuel source by local pulp mills.

Based on annual reporting by the WSML holders the aggregated annual volume is 64,200 m/t tonnes and this is comprised of approximately 18,000 m/t land clearing, 14,700 m/t wood waste and is 19,400 m/t for yard waste and 6,225 m/t food waste. The aggregated totals for material composted/soil blended is approximately 20,000 m/t. It is estimated that the total of organic material shipped as a fuel source to local mills is 44,200 m/t and this consists of landclearing material, wood waste and some yard waste.

Furthermore, approximately 1,200 m/t of de-watered biosolids are generated annually from the two waste water treatment plants operated by the RDN. The Class B digester sludge is currently land

applied. Facility upgrades underway are expected to increase biosolids production to approximately 1,600 m/t per year.

Assessment of waste to energy or waste to fuel options should consider the above referenced organic waste as a potential material source.

Previous Studies

Previous studies that are pertinent to this assessment are found in following attachments:

1. *Regional District Of Nanaimo Waste Generation Projections*, RDN, Technical Report, March 2015
2. *Solid Waste Composition Study Report*, Maura Walker & Associates, 2012.
3. *Tri-Regional District Solid Waste Study*, AECOM, May 2011.

APPENDIX 1

Prohibited Waste at RDN Facilities

At the Regional Landfill:

- (i) Biomedical Waste;
- (ii) Commercial Organic Waste;
- (iii) Concrete or asphalt pieces, or rocks greater than 0.03m³ or 70 kg;
- (iv) Corrugated Cardboard;
- (v) Drums;
- (vi) Garden Waste;
- (vii) Gypsum;
- (viii) Hazardous Waste;
- (ix) Household Plastic Containers;
- (x) Ignitable Wastes;
- (xi) Land Clearing Waste;
- (xii) Liquids, except as permitted herein;
- (xiii) Metal;
- (xiv) Motor vehicle bodies and farm implements;
- (xv) Municipal Solid Waste that is on fire or smouldering;
- (xvi) Radioactive Waste;
- (xvii) Reactive Wastes;
- (xviii) Recyclable Paper;
- (xix) Stewardship Materials;
- (xx) Special waste, as defined in the Special Waste Regulation (British Columbia) except asbestos ;
- (xxi) Tires;
- (xxii) Wood Waste

At Church Road Transfer Station:

- (i) Biomedical Waste;
- (ii) Commercial Organic Waste;
- (iii) Concrete or asphalt pieces, or rocks greater than 0.03m³ or 70 kg;
- (iv) Controlled Waste;
- (v) Corrugated Cardboard;
- (vi) Garden Waste;
- (vii) Gypsum;
- (viii) Hazardous Waste;
- (ix) Household Plastic Containers;
- (x) Ignitable Wastes;
- (xi) Land Clearing Waste;
- (xii) Liquids, except as permitted herein;
- (xiii) Metal;
- (xiv) Motor vehicle bodies and farm implements;
- (xv) Municipal Solid Waste that is on fire or smouldering;
- (xvi) Radioactive Waste;
- (xvii) Reactive Wastes;
- (xviii) Recyclable Paper;
- (xix) Special waste, as defined in the Special Waste Regulation (British Columbia) except asbestos;
- (xx) Stewardship Materials;
- (xxi) Tires;
- (xxii) Wood Waste.

TO: Larry Gardner
Manager, Solid Waste Services

DATE: November 18, 2015

FROM: Sharon Horsburgh
Senior Solid Waste Planner,
Solid Waste Services

MEETING: RSWAC, November 25, 2015

FILE: 5360-01

SUBJECT: RDN Solid Waste Management Plan Community Consultation Summary

PURPOSE

To provide an update on the community consultation with respect to the SWMP.

BACKGROUND

The Regional District of Nanaimo (RDN) is undertaking a review of its Solid Waste Management Plan (SWMP), which has been amended three times since provincial approval of the original Plan in 1988. The RDN has fully implemented their last SWMP, which was finalized in 2004. The current plan review is intended to identify “what’s next” and chart the course for solid waste management for the coming years. The process to review and update the region’s SWMP is as follows:

- Stage 1 (completed) – Review and analysis of current solid waste management system, status of the 2005 Plan, and identification of issues and opportunities for improvement;
- Stage 2 (60% complete) – Identify and review options to address the region’s future waste management requirements, select preferred options and prepare a report presenting the findings;
- Stage 3 – Prepare a draft updated SWMP, carry out a public review of the draft plan, incorporate changes from the public review and finalize the plan.

Consultation is a mandatory component of the planning process and is critical to the creation of a plan that can be supported by the public. Consultation is carried out throughout the process and commonly begins with dissemination of information to more active dialogue with the community in Stages 2 and 3 as options are reviewed and selected.

The Ministry of Environment outlines the expected components of a community consultation process in their document *Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts*. In addition, the RDN has a public consultation / communication framework to ensure a consistent, comprehensive and cost-effective approach to public consultation and communication initiatives. This framework, along with the Ministry’s guide, was used to prepare the Consultation & Communications Plan, which was presented to RSWAC in December 2014. To ensure the RDN is meeting the Ministry guideline, Maura Walker & Associates has been retained to provide feedback on the adequacy of the RDN’s efforts in relation in the Ministry of Environment’s *Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts*. Please refer to Appendix 1.

OBJECTIVES OF THE CONSULTATION & COMMUNICATIONS PLAN

Implementation of the Consultation & Communications Plan is intended to achieve the following objectives:

- i. Ensure that the process to develop the plan is collaborative and reflects a broad range of perspectives;
- ii. Provide opportunities to educate the public about the Solid Waste Management Plan and future options for managing waste;
- iii. Provide opportunities for public input on a range of options and estimated costs;
- iv. Increase support for the resultant solid waste management planning and programs;
- v. Meet the consultation expectations of the Ministry of the Environment.

IMPLEMENTATION STATUS

This memorandum describes the Consultation & Communications activities that have been completed to date.

REGIONAL SOLID WASTE ADVISORY COMMITTEE

The RSWAC is a multi-functional advisory and monitoring committee, combining technical, public and political interests into one committee. In our experience a combined committee ensures open, transparent and meaningful communication between all participants. RSWAC provides advice to the Regional District Board in regards to the content of the plan and associated consultation activities.

The committee is chaired by a non-voting RDN Board member to provide a direct link between the advisory committee and the RDN Board. Current membership of the RSWAC includes:

Alec McPherson	Chair, RDN Director
Jim Kipp	RDN Director, Deputy Chair
Craig Evans	Member at Large
John Finnie	Member at Large
Michele Green	Member at Large
Gerald Johnson	Member at Large
Jim McTaggart-Cowan	Member at Large
Ellen Ross	Member at Large
Amanda Ticknor	Member at Large
Frank Van Eynde	Member at Large
Larissa Coser	Community Representative
Jan Hastings	Non Profit Representative
Derek Haarsma	Business Representative
Michael Tripp	Business Representative
Wally Wells	Business Representative
Ed Walsh	Waste Management Industry
Stewart Young Jr.	Business Representative
Chief & Council	Nanoose First Nation
Chief & Council	Snuneymuxw First Nation
Michael Recalma	Qualicum First Nation
John Marsh	Town of Qualicum Beach
Fred Spears	District of Lantzville

Charlotte Davis
Glenn Gibson
Al Leuschen
Karen Muttersbach

City of Nanaimo
Island Heath
Ministry of Environment
Environment Canada

To date, there have been 10 meetings of RSWAC in association with updating the SWMP.

SOLID WASTE MANAGEMENT SELECT COMMITTEE

The RDN Board established a Solid Waste Management Select Committee (SWMSC), made up of members of the RDN Board, to oversee the process to update the RSWMP. This committee allows for deeper political consideration of the issues and ideas raised during planning process than would normally be afforded in regular Board meetings.

STAKEHOLDER CONSULTATION & COMMUNICATIONS

To date, the following stakeholder groups have been engaged as part of the consultation process:

- Neighbouring Regional Districts:
 - The RDN has collaborated with Cowichan Valley Regional District and Capital Regional District to review options for New and Emerging Technologies.
 - The RDN participates on the Association of Vancouver Island and Coastal Communities (AVICC). AVICC established a special committee on Solid Waste Management in response to the need identified by members to initiate a process to work toward finding a long-term sustainable strategy for solid waste management on Vancouver Island and the coastal communities. The nine regional districts within the AVICC region are committed participants. The Chair of the RSWAC represents the RDN on the AVICC special committee.
 - In April 2014, a presentation regarding organics diversion was provided in conjunction with MOE Staff and Metro Vancouver Staff at the BC Land Summit to an audience of 50.
- Local business associations:
 - In October 2014 the RDN was invited to speak at the Waste Management Association of BC with regards to our SWMP.
- Waste haulers and processors:
 - On February 18, 2014 the RDN hosted a roundtable discussion with solid waste industry representatives and elected officials. Approximately 60 people were in attendance.
 - Staff responded to two Strata's that were interested in the Solid Waste Management Planning process in relation to organics collection for multi-family buildings. On November 14, 2014 staff presented strata members the various options for composting available to multi-family residents. There were roughly 60 people in attendance. In August 2015, RDN staff worked collaboratively with a large multi-family building to introduce a curbside collection program for recycling and food waste.
 - Interviews are ongoing with individual waste stream management license (WSML) as part of the WSML inspection schedule. These stakeholders are contacted in person and feedback is gathered by face to face interview. The topic of the SWMP development process is introduced and feedback on the implications for their disposal facilities is documented.

PUBLIC CONSULTATION & COMMUNICATIONS

From the start of the process to update the SWMP, there have been many tools employed to keep the general public informed about the planning process, as well as activities where the general public have been engaged to provide their opinion. The following table details the communication and consultation activities that have been undertaken so far.

Communication Activities	
Residential Newsletters: Zero Waste & Regional Perspectives Solid Waste Curbside newsletters from the RDN and the City of Nanaimo.	<ul style="list-style-type: none"> ▪ December 2013 – Zero Waste Newsletter ▪ March 2015 – Zero Waste Newsletter ▪ Fall 2013 – Regional Perspectives ▪ Summer 2015 – Regional Perspectives ▪ RDN - Summer 2013 ▪ RDN - Winter 2013 ▪ City of Nanaimo - Fall 2013 Newsletter
RDN website	<ul style="list-style-type: none"> ▪ The RDN website has a dedicated SWMP webpage that is updated regularly with information about the SWMP process. Information posted includes: <ul style="list-style-type: none"> ○ RSWAC agendas and minutes ○ Technical memoranda/discussion papers ○ Media releases ○ Links to active on-line surveys ○ Information about consultation events
Cable Television	<ul style="list-style-type: none"> ▪ March 5, 2015 RDN conducted an interview with Shaw Cable’s Ian Holmes. The main topics included: <ul style="list-style-type: none"> ○ Garbage/recycling issues facing RDN, ○ What a solid waste management plan will do, ○ Landfill or incineration, and ○ Future changes in curbside pick-up.
Consultation Activities	
Zero Waste Community Day	<ul style="list-style-type: none"> ▪ October 4, 2014 the RDN participated in the Zero Waste Community Day that was part of the Zero Waste Nanaimo Conference.
Surveys	<ul style="list-style-type: none"> ▪ On-line surveys were conducted in the winter and summer of 2015 to get early input from the public on various solid waste issues and options. The winter survey received 450 responses and the summer survey received 180 responses. ▪ Public outreach was conducted at regional facilities on 4 separate occasions and approximately 110 customers were presented with the survey.
Tracking Feedback	<ul style="list-style-type: none"> ▪ Approximately 20 phone calls have been received to date at the RDN offices regarding the plan. All input received from the public (phone, email, fax, letters) is tracked so that it can be considered by RSWAC and the Board when considering what to include in the updated plan.

<p>Presentations to Community Groups</p>	<ul style="list-style-type: none"> ▪ On request, RDN staff attended community group meetings to present on the SWMP, respond to questions and gather feedback. <ul style="list-style-type: none"> ○ November 4, 2014 - Horses of Hope – Dealing with Deceased animal carcasses in the context of Solid Waste Management Planning. ○ August 10, 2015 intergovernmental MFD meeting at Cameron Island Multi family residence. 25 strata residents received information regarding the introduction of a multi-family recycling and organics collection service. ○ September 4, 2015 AVICC - Vancouver Island Conference ○ On November 14, 2015, staff attended the Millstream Acres Strata Meeting. Roughly 60 people were in attendance.
<p>Community events</p>	<ul style="list-style-type: none"> ▪ Staffed information displays on the SWMP were in place at several community events and the number of people we interacted with: <ul style="list-style-type: none"> ○ July 5, 2015 - Qualicum Beach Family Day (35) ○ July 23 & 25, 2015 - Nanaimo Bathtub Days (55) ○ August 15, 2015 Errington Farmers Market (50) ○ August 21-23, 2105 – Vancouver Island Exhibition (300) ○ September 12, 2105 - Lantzville Minetown Day (25) ○ October 8, 2015 - Vancouver Island University Sustainability Fair (15)

MUNICIPAL CONSULTATION & COMMUNICATIONS

Municipal councils are a key stakeholder in the planning process and the Communications and Consultation Plan aims to keep the Councils informed of the Plan’s development. The following table details the municipal engagement activities that have been undertaken so far.

<p>Parksville Council Meeting</p>	<p>May 27, 2014 – Overview of Solid Waste Management Plan review process.</p>
<p>Nanaimo Council Meeting</p>	<p>August 18, 2014 - Overview of Solid Waste Management Plan review process.</p>
<p>Lantzville Council Meeting</p>	<p>September 8, 2014 - Overview of Solid Waste Management Plan review process.</p>

FIRST NATIONS CONSULTATION & COMMUNICATIONS

Local First Nations have been included in the consultation process to date they receive meeting invites, to RSWAC as well as the agendas, meeting minutes and technical information.

UPCOMING ACTIVITIES

A Strategic Communications Plan is being developed for Stage 3 consultation. To promote the public meetings, ads will be published in each of the Nanaimo Daily News, Harbour City Star, Gabriola Sounder, Nanaimo Bulletin, PQ News and Take 5. Ads will indicate dates, times and locations of the public meetings.

IMPACT ON DIVERSION

The Solid Waste Management Plan review is an opportunity to review existing waste diversion targets and for the Region to consider establishing new targets as well as to categorize and evaluate existing quantities.

REGULATORY AUTHORITY

Consultation is a mandatory component of the SWMP review process. The Ministry of Environment's document *Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts* requires that public consultation be conducted. Any new regulatory authorities must be requested by Regional Districts and included in the SWMP to be considered for approval by the Province.

SUMMARY/CONCLUSIONS

The RDN is undertaking a review of its SWMP. The current plan review is intended to chart the course for solid waste management for the next five years. The review and update of the SWMP is a three stage process.

Consultation is a mandatory component of the planning and is carried out throughout the process. The Consultation & Communications Plan is intended to achieve the following objectives: ensure that the process to develop the plan is collaborative and reflects a broad range of perspectives; provide opportunities to educate the public about the SWMP and future options for managing waste, provide opportunities for public input on a range of options and estimated costs, increase support for the resultant solid waste management planning and programs, meet the consultation expectations of the MOE.



Maura Walker & Associates
ENVIRONMENTAL CONSULTANTS

Sharon Horsburgh, Senior Solid Waste Planner
Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2

November 13, 2015

Dear Sharon,

Re: RDN Solid Waste Management Plan Stage 1 and 2 Consultation Efforts

As per your request, I have reviewed the memorandum entitled *RDN Solid Waste Management Plan Community Consultation Summary* for the purposes of providing feedback on the RDN's consultation efforts to date. This letter provides my opinion on the adequacy of the efforts in relation in the Ministry of Environment's *Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts*, as well as the proposed modifications to these guidelines as outlined in the Ministry's Intention Paper (September 2015).

The following table lists the Ministry's proposed consultation principles, which build on the direction of the existing guidelines, and lists how the RDN's consultation process has (or has not) incorporated these principles in its SWMP consultation efforts to date.

Ministry's Proposed Consultation Principles	Efforts Undertaken by the RDN
Stakeholder involvement begins at the design stage of the consultation process	<ul style="list-style-type: none"> • Draft consultation plan provided to RSWAC at December 11, 2014 meeting for input • General public engaged early in the planning process through on-line surveys • Engaging with the community through a dialogue on how to achieve Zero Waste at the Zero Waste Community Day
The consultation process engages a cross-section of the stakeholder group that may include waste	<ul style="list-style-type: none"> • RSWAC is a combined public and technical committee with a broad range of stakeholder

<p>and recycling service providers, product stewardship agencies, local environmental groups and recycling organizations, residents within the plan's region, engineering and/or planning departments of the regional district's member municipalities, First Nations within or adjacent to the plan area, local business groups and ratepayers organizations, consumer groups, unions, large commercial and institutional solid waste generators, and local school districts</p>	<p>interests represented</p> <ul style="list-style-type: none"> • Direct contact with affected stakeholder groups conducted as a need to do so is identified, or as requested; e.g. Meetings with local solid waste industry (February and October 2014) and meetings with strata councils
<p>Stakeholders are provided with effective and timely notice of consultation opportunities</p>	<ul style="list-style-type: none"> • RDN and City of Nanaimo newsletters are used as vehicles to inform residents about the planning process and available opportunities for input • The dates for RSWAC meetings are established and shared with the committee members well in advance of the actual meeting dates
<p>Stakeholders are able to determine the implications to their interest by reading the wording in the document that is the subject of the consultation</p>	<ul style="list-style-type: none"> • Detailed RSWAC meeting minutes are provided to the committee in draft form and ratified at the subsequent meeting
<p>Stakeholders are provided with sufficient time to respond to draft documents</p>	<ul style="list-style-type: none"> • RSWAC agenda packages, including technical reports, are generally sent to committee members electronically one week in advance of meetings to provide adequate review time
<p>Proceedings and results of activities that are part of the consultation process are properly documented and available for public review so that stakeholders are able to see how the plan will or will not address their comments or issues</p>	<ul style="list-style-type: none"> • All of RSWAC agenda packages are posted on the RDN's SWMP website • All ratified RSWAC minutes are posted on the RDN's SWMP website • All related background reports and technical memoranda are posted on the RDN's SWMP website • Tracking feedback received through phone calls, emails and other forms of communication (Note: the mechanism for sharing this input with RSWAC is undefined in the memorandum)

It is clear from the above table, that the RDN is undertaking a consultation program that is in line with the Ministry's proposed guidelines. The primary venue for consultation during Stages 1 and 2 has been RSWAC, as intended by the Ministry's Guidelines. The inclusion of general public engagement activities such as the on-line surveys and the newsletters goes above and beyond the Ministry's expectations for Stages 1 and 2, and is to be commended.

As you progress into Stage 3 of the planning process, it is expected that the draft of the RDN's updated SWMP will be subject to an appropriate level of consultation, with both affected stakeholders and the general public. The extent of consultation activities should correlate to the significance and impact of proposed actions identified in the draft plan.

As the last consultation principle in the table notes, it will be important to effectively record the input received during this final Stage, as well as show how this input was considered in the preparation of the final version of the SWMP is evident.

To satisfy the expectations of the Ministry, I believe the core objectives of your Stage 3 consultation process should be:

- To be inclusive of all interests;
- To be open and transparent; and
- To provide an opportunity for all community voices to be heard.

The RDN is well on its way to meeting these objectives.

Yours truly,



Maura Walker

TO: Larry Gardner
Manager, Solid Waste Services

DATE: October 26, 2015

FROM: Amanda Kletchko
Special Projects Assistant

MEETING: RSWAC, November 7, 2015

FILE: 5380-20

SUBJECT: Share Shed programs at the Regional District of Nanaimo Solid Waste Facilities

RECOMMENDATION

That the report be received for information.

PURPOSE

The Regional Solid Waste Advisory Committee (RSWAC) included the introduction of "Share Sheds" at the Regional Landfill (the Landfill) and Church Road Transfer Station (CRTS) as an option to be considered as part of the current Solid Waste Management Plan (SWMP) review.

BACKGROUND

Share Sheds give customers the opportunity to set aside items in good condition for re-use by others instead of landfilling; the installation of Share Sheds at the CRTS and the Landfill could result in greater waste diversion as items are donated and re-used instead of landfilled.

Currently, CRTS and the Landfill do not offer any customer exchange programs, and salvaging is not permitted. Share Sheds have not yet been introduced at the facilities primarily due to potential liability to the Regional District of Nanaimo (RDN) by making salvaged material available to the public. Other considerations include managing traffic, loitering, space and staffing implications.

In order to reduce potential liability, the RDN could introduce a program that imitates the program run by the Capital Regional District. In this scenario, items collected are offered only to local thrift stores or non-profit groups - the public does not have access to items in the Shed. This program could involve a list of desired items submitted to the facility by the receiving organizations, and those items would be identified and set aside by the customers as directed by the Attendants. Alternately, Attendants could be responsible to determine if items are suitable for donation, and pickup could be assigned on a regular basis. The submission of a liability waiver by the receiving organization could solve any liability issues that may arise.

It may be possible to locate sheds inside or outside the scaled areas of both the Landfill and CRTS:

Outside the scaled area

If the Share Sheds are located outside the scaled area, the Attendant would be required to direct the customer to the Share Shed for drop-off. The customer would be required to travel over the scales to complete their waste transaction, and proceed to the Share Shed location. There would be no revenue created with this method, as the customer would not be paying to drop off their item.

Care and planning must take place to reduce traffic congestion and/or confusion. Providing sheds outside of the scaled area could require additional staffing to provide oversight and to maintain the facility. Diversion could be tracked when the receiving organization crosses the scale at the time of pick up.

Inside the scaled area

By providing a Share Shed inside the scaled area, the Attendant would be required to direct the customer to the Share Shed for drop-off, but the customer would not be required to pass over the scale first. This would allow the RDN to continue to collect revenue for all items brought to the site, and the amount of material diversion could still be monitored at the time of pickup by the receiving organization. Additional staff may not be required to monitor the shed, as it would be in the vicinity of the bins area. Attendants may have to field questions by self-haul customers regarding why they cannot take items from the shed.

If it was determined that there would be no charge to the customer for dropping items off for donation, the customer would be required to travel over the scales to complete their waste transaction, and then proceed through the bypass lane and back into the scaled area. Care and planning would need to take place to reduce traffic congestion and/or confusion.

Moving forward with this program could increase customer satisfaction, as requests by customers to provide others with access to reusable items (i.e. furniture and household items), is common. Customers have expressed the desire for a Share Shed, explaining that they have good items to donate, and would like to see things reused rather than landfilled. As they have already made the trip to the facility, it would be convenient if they did not have to travel further to donate at a thrift shop. Staff at the Cowichan Valley Regional District's Bing's Creek facility have indicated that their Share Shed program is very popular with customers, and Attendants at the Landfill say that the amount of re-usable items being landfilled appears high. Nanaimo Recycling Exchange offers free drop-off in their Community Market, but customers must purchase desired items.

A number of guidelines would need to be pre-determined prior to the installation of the Share Sheds:

Acceptable items

The RDN would need to determine what items are considered acceptable in the Share Shed, and also who would be responsible to say if an items belongs in the shed.

Length of Time

A regular routine of organization pickup must be put in place, whether the RDN contacts the organization when the shed is full, or whether a truck comes by on a pre-determined schedule.

Liability

Prior to implementing the Program, the RDN would need to determine liability of collecting second hand goods on behalf of a non-profit organization.

IMPACT ON DIVERSION

It is estimated that approximately 160 - 240 tonnes of waste could be diverted from the Landfill per year resulting in a 0.32% - 0.45% diversion rate. This value is based on the estimations made by landfill Attendants who indicate that one to two 16' cube vans worth of items (1500kg capacity) are re-saleable per week, depending on the time of year.

FINANCIAL IMPLICATIONS

Short Term Costs

Time required to prepare the area is location dependent. Preparation at CRTS could be completed within a few hours to a day; preparation at the Landfill could take up to several days due to space restrictions. A Planner or Engineer may need to be involved in planning the Sites for best use of space and roadways.

Financial requirements to prepare areas for the Share Sheds is dependent upon the chosen location of the sheds at each facility. The current rate of Engineering consultation, if required, is \$200/hr. Labourers, operators and equipment are available on site at the Landfill at a rate of \$175/hr; labourers and operators are available at CRTS at a rate of \$75/hr, but equipment may need to be rented at a rate of \$125/hr and a mob/de-mob fee of approximately \$500. New informational signage and directional line painting will be necessary.

The cost of a shed varies with size and model. Based on pricing from Global Industries¹ (Figure 1), a metal garage approximately the size of a two-car garage 12w x 32l x 8h (2169 ft³) with a roll-up door, is \$4,400 including the cost of freight. Pricing from Future Buildings² (Figure 2) for a steel garage kit 16w x 32l x 17h (8704 ft³) is \$26,000 including freight, as of Aug. 12, 2015. Table 1 gives greater detail on short term pricing estimates.

Figure 1 Global Industries DuraMax Metal Garage

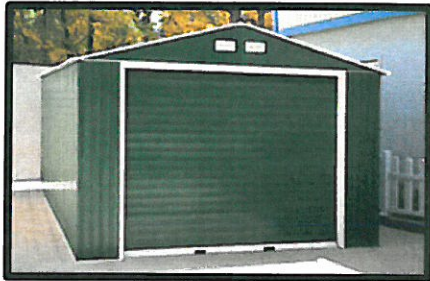


Figure 2 Future Buildings Steel Garage Kit



¹ Global Industries, *Buildings and Storage Sheds, DuraMax Large metal Garages with Roll-Up Door*, <http://www.globalindustrial.ca/g/outdoor-grounds-maintenance/sheds/metal-storage-sheds/duramax-large-metal-storage-garage-with-door>
Accessed: August 4 2015

² Future Buildings, *Steel Garage Kits*, <http://www.futurebuildings.com/future-steel-products/steel-garage-kits.html/ngallery/page/1>
Accessed: August 17, 2015

Table 1 Share Shed Pricing Estimate

Landfill				
	Amount	Unit	Per unit cost	Total
Labour and Equipment	6	Hours	\$175	\$1,050
Engineering	4	Hours	\$200	\$800
Building	1	Each	\$4,000	\$4,000
Building Delivery	1	Each	\$600	\$600
Road Marking	1	Each	\$200	\$200
Signage	2	Each	\$75	\$150
Total				\$6,800.00
CRTS				
Labour	4	Hours	\$75	\$300
Equipment	2	Hours	\$100	\$200
Mob/de-mob	1	Each	\$500	\$500
Building	1	Each	\$4,000	\$4,000
Building Delivery	1	Each	\$600	\$600
Engineering	1	Hours	\$200	\$200
Road Marking	1	Each	\$200	\$200
Signage	2	Each	\$75	\$150
Total				\$6,150.00

Total Share Shed Short Term Cost Two Locations \$12,950.00

Long Term Costs

A Share Shed will require regular housekeeping by an attendant in maintaining the Share Shed, including directing customers and general tidying. Depending on the location of the shed, one additional Attendant at each location may be needed to monitor the area at a rate of \$33/hr.

Table 2 Labour Estimate

Landfill							
	Personnel	Amount	Unit	Per unit cost	Total per day	Total per week	Total per year
Labour	1	8	Hours	33	\$312	\$2,184	\$96,096
CRTS							
Labour	1	8	Hours	33	\$312	\$2,184	\$96,096
Total Labour Both Locations					\$624	\$4,368	\$192,192

REGULATORY AUTHORITY

Should the RDN decide to move forward with implementing Share Sheds at the Landfill and CRTS, there does not appear to be any changes necessary to RDN authority regarding this program.

SUMMARY

Share Sheds give customers the opportunity to donate items in good condition for re-use by others instead of landfilling; the sites could take on a similar program to that of the Capital Regional District, where items are donated to local thrift stores. From the customer's perspective, the option to donate good quality items at the facility is preferable to landfilling or traveling to a thrift shop. Feedback from facilities that currently offer a Share Shed program indicate that the program is extremely popular with customers, and Attendants at both RDN facilities often see re-useable items being landfilled.

The installation of Share Sheds at the CRTS and the Landfill could result in some waste diversion as items are donated instead of landfilled. The introduction of Share Shed programs at the Landfill and CRTS could result in waste diversion of 160-243 tonnes per year, or a 0.31% - 0.45% diversion rate.

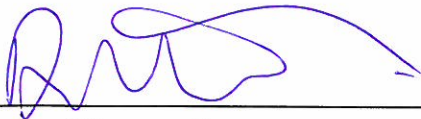
Installing Share Sheds would have a number of short term costs including site preparation, engineering, buildings and signage; Capital costs to introduce Share Sheds at the two facilities could be approximately \$13,000. Over the long term, and depending on the location of the Share Sheds, there could be additional labour costs in running the program as one additional Attendant may be required for maintenance purposes; annual operating costs could be approximately \$190,000 per annum for the two sites.



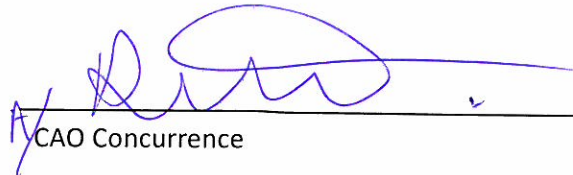
Report Writer



Manager Concurrence



General Manager Concurrence



CAO Concurrence

TO: Larry Gardner
Manager, Solid Waste

DATE: October 26, 2015

FROM: Amanda Kletchko
Special Projects Assistant

MEETING: RSWAC, November 7, 2015

FILE: 5380-20

SUBJECT: EPR Stewardship at Regional District of Nanaimo Solid Waste Facilities

RECOMMENDATION

That the report be received for information.

PURPOSE

The Regional Solid Waste Advisory Committee (RSWAC) included the collection of Extended Producer Responsibility (EPR) stewarded items at the regional facilities as an option to be considered as part of the current Solid Waste Management Plan (SWMP) review.

BACKGROUND

EPR Stewardship Programs are programs that manage the collection and recycling of items that would otherwise end up in the landfill. There are currently seventeen Stewardship Agencies in BC (Appendix 1), recycling items such as paint and paint products, household lighting and fixtures, thermostats, cell phones, small appliances, batteries, tires, and smoke alarms. Recycling acceptance at the Regional Landfill (the Landfill) and Church Road Transfer Station (CRTS) is currently limited to metal, cardboard, yard waste, wood waste, automotive batteries, oil filters, and propane tanks. The Regional District of Nanaimo (RDN) has not expanded recycling services for EPR type materials, as the 2004 Zero Waste Plan identified the services to be provided by the private sector. It was also acknowledged in the 2004 SWMP review that the RDN would incur significant costs to establish depots at regional facilities due to additional staffing requirements, and space limitations, particularly at the Regional Landfill where space is limited.

As well as the EPR programs mentioned, the RDN could expand recycling services to include glass, polystyrene foam (i.e. styrofoam) and plastic bags (MMBC items) and a variety of hard plastic including lawn furniture and toys, which are not stewardship products.

With the growth of EPR programs there are now several for-profit depots in the Nanaimo and Parksville areas where stewardship items are accepted, including Regional Recycling (two locations: Old Victoria Road and Kenworth Road), Parksville Bottle and Recycling Depot and Qualicum Bottle Depot. Nanaimo Recycling Exchange and Gabriola Island Recycling Organization are the local non-profit organizations that collect EPR items. Taking on EPR at the regional facilities may negatively impact revenues at these other facilities; for example, the facilities that Encorp Electronics Recycling works with are mostly for-profit, individually owned and operated businesses that rely on the volumes collected in the electronics program.

Aside from housekeeping, sorting and packaging duties, the EPR programs are managed by the program Stewards. Collection and transportation of large bins are arranged by programs such as ReGeneration, and bins and signage are provided. For smaller items not requiring bin pickup such as Switch the 'Stat and Recycle My Cell, pre-paid courier waybills are provided, and it is up to the facility to ensure the package is appropriately shipped to the Stewards.

The Stewards determine the site requirements, which may include secure storage, protection from weather, supervised collection, and paved surfaces for easy pickup of large bins. The Stewards work with the facility to set up and train staff to identify which items are accepted or not accepted. Before taking on certain programs such as ReGeneration and Electronic Products Recycling Association (EPRA), coverage reviews and site inspections may be required. For example, the Nanaimo and Parksville areas are well covered by Encorp Pacific's Electronics Recycling program for EPRA; this group may not be interested in expanding their collection sites in the RDN area.

At the Cowichan Valley Regional District's Bings Creek Centre, ReGeneration items (paint, lighting products, pesticides & flammable liquids, smoke & CO alarms, major and small appliances, power tools, outdoor power equipment) make up the greatest volume of incoming recycling. Accepting ReGeneration items increases revenue but, the facility must to manage the residuals as well. Residuals from this program may include solvents, brushes, rollers, and patching kits, among other items; turning customers away with such products could result in abandonment and other unsuitable disposal practices.

Facilities are compensated by some of the EPR programs for the recycling they collect; therefore, customers may not be charged a drop-off fee for these items. EPR drop-off areas must be separate from garbage and non-EPR recycling areas in order to appropriately track disposal. There appears to be space to accommodate EPR acceptance at the CRTS facility, but space at the Landfill is extremely limited. Considerable effort and time would be required to reorganize the facility to accommodate EPR acceptance. It is possible that reconfiguring the layouts at the facilities could encourage customers to recycle more of their items rather than using the garbage bins.

EPR bins could be located inside or outside the scaled areas at both facilities:

Outside the scaled area:

If the bins are located outside the scaled area, customers would be required to drop off EPR items before or after crossing the scale with garbage and other paid recycling. Care and planning must take place to reduce traffic congestion and/or confusion.

Inside the scaled area

If bins are located inside the scaled area, customers would be required to use the bypass lane before or after dropping off their paid garbage and recycling items. Pre-planning and attendant diligence must take place to prevent dumping of garbage and other paid items in the recycling area. Care and planning must take place to reduce traffic congestion and/or confusion.

RDN residents have expressed interest in the facilities' expanding acceptance to include EPR stewardship items for recycling. From the customer's perspective, the convenience of a "one stop drop off" facility could increase their satisfaction as the need to travel to a second recycling location is eliminated. Additionally, by increasing the recycling options at the facilities, diversion rates could increase as facilities staff would be able to redirect customers to convenient on-site EPR recycling.

IMPACT ON DIVERSION

Based on information obtained from Table 3 of the 2012 RDN Waste Composition Summary¹, it is estimated that EPR items could make up between 0.23% - 0.46% of the waste stream at the two RDN facilities, depending on what percentage of current recyclable items in the waste stream get diverted (Appendix 2).

Bin Attendants at both facilities often see EPR items disposed of into the garbage bins; most commonly, plastics, polystyrene, and glass, as well as paint cans, electronics and bicycle/ATV tires. It is possible that reconfiguring the layouts at the facilities could encourage customers to recycle more rather than using the garbage bins. For example, making the garbage bin inconvenient to use, or reducing the number of garbage bins from two to one, and requiring customers to use clear garbage bags and pre-sort their items before arriving at the facilities may help to increase diversion of recyclable items from the Landfill.

The Nanaimo area is currently ahead of the provincial average for electronics recycling, with 5.63kg per capita collected, as compared to the provincial average of 4.9kg per capita. The highest diversion rate in BC is in the Central Okanagan area, with 7.95kg per capita.² The RDN would have to capture an additional 2.32kg per person of new material to reach the Central Okanagan rate; calculations performed for the purpose of this report indicate that approximately 1.20kg per person of additional electronics is available to be collected by the RDN (based on values in the Solid Waste Composition Study).

FINANCIAL IMPLICATIONS

Rebates

Rebates are offered to collection facilities for some EPR items, which could help to offset any reduction in tipping fees. Rebates for common household recyclables are outlined in Appendix 3, and range from \$0.10/L for used oil to \$120 for newer, working cell phones. Based on EPR rebates received by the Capital Regional District (Environmental Resource Management Annual Report 2013, page 23³), and by comparing tonnages accepted on a per capita basis, the RDN could potentially receive rebates of approximately \$56,000 - \$59,000/yr. (Appendix 4).

It is important to note that the RDN may not be picked up by some EPR programs if they determine that coverage for their items is already sufficient in the Nanaimo area.

Short Term Costs

Time required to prepare the area is location dependent. Preparation at CRTS could be completed within a few hours to a day; preparation at the Landfill could take up to several days due to space restrictions. A Planner or Engineer may need to be involved in planning the sites for best use of space and roadways. Several EPR items are collected in tubs measuring approximately 4'x4', and the Household Hazardous Waste bin is a metal bin approximately 12'x5' with a 4' latching door on the front which must be located outdoors. Ideally, a covered and paved area would be required for EPR collection, with room for a forklift and space for a truck and trailer to safely maneuver. The purchase of a new or used forklift may be required.

¹ Walker, Maura and Associates. *Solid Waste Composition Study Report (2012)*, <http://rdn.bc.ca/cms/wpattachments/wpID1602atID5945.pdf> Accessed August 20, 2015

² Personal communication between RDN and Encorp Electronics September 2015

³ Capital Regional District. *Environmental Resource Management Annual Report (2013)* <https://www.crd.bc.ca/docs/default-source/crd-document-library/annual-reports/solid-waste/2013-erm-annual-report-web.pdf?sfvrsn=4> Accessed September 3, 2015

The cost to prepare areas for EPR items is dependent upon the chosen location at each facility. The current rate of Engineering consultation, if required, is \$200/hr. Labourers, operators and equipment are available on site at the Landfill at a rate of \$175/hr; labourers and operators are available at CRTS at a rate of \$75/hr, but equipment may need to be rented at a rate of \$125/hr and a mob/de-mob fee of approximately \$500.

New informational signage, directional line painting, and paving will be necessary as specified by the EPR program requirements. If the recycling facilities are expanded to include Styrofoam acceptance, there are several models of foam densifiers available. CVRD currently operates with a Recycle Tech XT-200SA, using heat to densify the foam; the XT-200SA is not large enough to handle the Bing's Creek current foam volume (max volume of this model is 200lb/hr). The XT-200SA is approximately \$35,000 CAD; the commercial-sized model XT-500SA handles 500 lb/hr and is approximately \$85,000 CAD. Heger Foam Compacting Systems offer compaction processing as opposed to heat treatment; Heger "Tiger" and "Lion" models range from approximately \$69,000 to \$127,000 CAD including freight from Germany, as of August 2015. Alternatively, foam could be shipped un-densified, resulting in less of a rebate from MMBC.

The cost of a covered recycling shelter varies with size and model. Based on pricing from Future Buildings⁴ (Figure 1), a bolt together metal carport approximately 10w x 20l x10h (ft), is \$15,000 per unit. A much cheaper version shelter would be the 12w x 20l x8h Global Industries Steel Carport⁵ (Figure 2) for approximately \$2,000. Table 1 shows greater detail of short term costs that could be incurred by this project.

Figure 1 Future Buildings Metal Carport

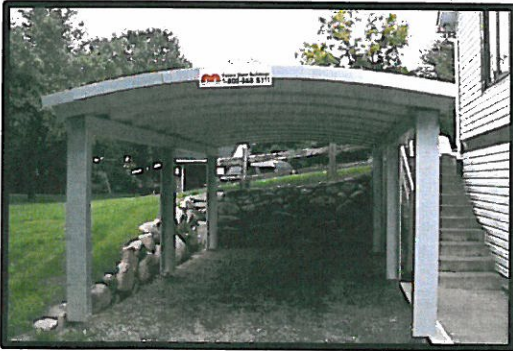


Figure 2 Global Industries Steel Carport



⁴ Future Buildings, *Carport Kits and Shelters*, <http://www.futurebuildings.com/future-steel-products/carport-kits.html>
Accessed: August 17, 2015

⁵ Global Industries, *Gray 12xW x 20'L x8'H Steel Carport*,
<http://www.globalindustrial.ca/g/outdoor-grounds-maintenance/tarps-canopies/carport/Steel-Carports> Accessed: August 17, 2015

Table 1 EPR Stewardship Short Term Pricing Estimate

Landfill				
	Amount	Unit	Per unit cost	Total
Labour and Equipment	20	Hours	\$175	\$3,500
Engineering	8	Hours	\$200	\$1,600
Styrofoam densifier	1	Each	\$85,000	\$85,000
Forklift	1	Each	\$20,000	\$20,000
Building 10x20	1	Each	\$15,000	\$15,000
Paving	25	m ²	\$50	\$1,250
Road Marking	1	Each	\$200	\$200
Signage	2	Each	\$75	\$150
			Total	\$126,700.00
CRTS				
Labour	6	Hours	\$75	\$450
Equipment	2	Hours	\$100	\$200
Mob/de-mob	1	Each	\$500	\$500
Building 10x20	1	Each	\$15,000	\$15,000
Engineering	1	Hours	\$200	\$200
Styrofoam densifier	1	Each	\$85,000	\$85,000
Forklift	1	Each	\$20,000	\$20,000
Road Marking	1	Each	\$200	\$200
Signage	2	Each	\$75	\$150
			Total	\$121,700.00
Total EPR Recycling Expansion Short Term Cost Two Locations				\$248,400.00

Long term costs

The Capital Regional District has three employees dedicated to managing the recycling area; part of the agreement with the ReGeneration program is that there must be supervised collection at the site. There is some labour intensiveness involved in maintaining EPR programs, including spotting and sorting items as they arrive, preparing items for shipment to the stewards, and general housekeeping duties. Depending on the location of the shed, two additional attendants at each location may be needed to monitor the area at a rate of \$33/hr including the cost of benefits. Table 2 outlines the estimated labour requirements in an expanded facility.

As an EPR depot, the RDN would also be required to have in place indemnity insurance.

Table 2 Long Term Labour Costs

Landfill							
	Personnel	Amount	Unit	Per unit cost	Total per day	Total per week	Total per year
Labour	2	8	Hours	33	\$528.00	\$3,696.00	\$192,192.00
CRTS							
Labour	2	8	Hours	33	\$528.00	\$3,696.00	\$192,192.00
Total labour two locations					\$1,056.00	\$7,392.00	\$384,384.00

REGULATORY AUTHORITY

Should the RDN decide to move forward with implementing EPR Stewardship at the Landfill and CRTS, there does not appear to be any changes necessary to authority under the existing SWMP.

SUMMARY

The introduction of an EPR recycling program at the Regional Landfill and CRTS could result in an increase in waste diversion by approximately 0.22% – 0.45%, as customers use on-site recycling stations as opposed to landfilling. Options for recycling expansion include taking on various EPR programs such as ReGeneration (paint, household lighting, CO and smoke alarms, small appliances), cell phones, batteries, and thermostats, among others. Currently, there are several for-profit and non-profit depots in the Nanaimo and Parksville areas where EPR items are accepted; taking on EPR at the regional facilities could negatively impact revenue at these facilities that depend on the volumes collected for the programs.

Storage containers and signage are provided by the EPR programs, and the shipping of items for recycling is covered with free packaging and pre-paid courier waybills or bin pickup for large volumes. The Stewards determine the site requirements, which could include secure storage, protection from weather, supervised collection, and paved surfaces for safe pickup of large bins. Some Stewards will also determine if there is currently adequate collection coverage in an area; if coverage is considered suitable, they are not required to expand their collection.

Collection rebates are offered by some programs, and could help offset the loss of tipping fees. Rebates range in value from \$0.10/L for used oil to \$120 for newer model working cell phones. Based on rebates received by the Capital Regional District in 2013, the RDN could expect rebates in the range of \$56,000 - \$59,000 per year, if all programs agree to receive EPR items from RDN facilities.

From the customer’s perspective, the convenience of a “one stop drop off” facility could increase their satisfaction as the need to travel to a second recycling location is eliminated. Plastics, polystyrene, and glass are often observed in the garbage bins, as well as paint cans, electronics and tires. Adding EPR and reconfiguring the facility’s layouts could increase both convenience and diversion rates.

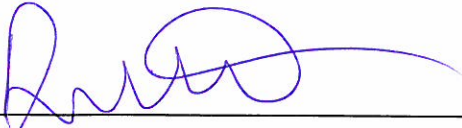
The introduction of EPR programs at the sites would have a number of short term costs including site preparation, engineering, new equipment, buildings and signage. The preliminary cost to expand recycling by addition of EPR items at the regional disposal facilities would be an estimated \$250,000 in modifications to accommodate increased recycling. Over the long term there would be additional labour costs in providing two additional personnel as well as a potential loss in tipping fee revenue if EPR items were made available for free drop off. It is estimated that there would be an additional cost of \$380,000 per annum to staff the expanded recycling at both regional facilities.



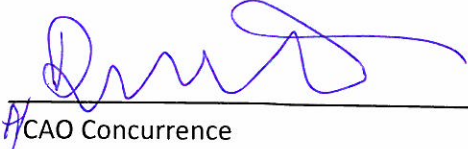
Report Writer



Manager Concurrence



General Manager Concurrence



CAO Concurrence

APPENDIX 1

List of EPR Programs

Stewardship Program Name	Products Covered
AlarmRecycle	Used or expired smoke alarms, carbon monoxide (CO) alarms and combination smoke & CO alarms.
BC Used Oil Management Association	Antifreeze, lubricating oil, oil filters and oil containers.
Brewers Association of Canada	Beer containers (bottles, cans and kegs).
Canadian Battery Association	Consumer and industrial lead-acid batteries.
Call 2 Recycle	Non-rechargeable, rechargeable and cell phone batteries.
Electronic Products Recycling Association	Computers and components, TVs, video players, home audio-visual items, portable and car audio devices. Corded and cordless phones, walky talkies, electronic musical instruments, medical monitoring & treatment devices and video gaming systems & accessories.
Encorp Pacific (Canada)	Return for deposit soft drink, juice, water, and alcohol beverages in glass, plastic, aluminum and drinking box, gable top, or pouch containers. Also accepts plastic and gable-top milk non-deposit containers. Provides depot recycling drop-off for products listed beside the Electronics Products Recycling Association.
Light Recycle	All residential and commercial light bulbs, tubes, table and floor lamps and fixtures and outdoor lights and strings. The program is operated by Product Care Association.
Health Products Stewardship Association	Leftover medicines can be returned to participating pharmacies throughout BC. Not accepted at the Nanaimo Recycling Exchange.
Multi-Material BC	Residential packing and printed paper on behalf of industry
Outdoor Power Equipment Institute of Canada	Electrical outdoor power equipment, ranging from lawn movers to grass trimmers, chain saws and pressure washers.
ReGeneration	Paint, flammable liquids, domestic pesticides and gasoline.
Recycle My Cell	Cell phones, smart phones, wireless PDAs, batteries and pagers.
Switch the 'Stat	Older mercury-containing thermostats and electronic thermostats.
Telus Return & Recycle Program	Used mobile handsets and accessories, and telecommunication items such as corded phones, cordless phones and charging stations, modems, routers, gateways and TV remote controls.
Tire Stewardship BC	Scrap vehicle tires, bicycle tires and tubes.
Unplugged Small Appliance Recycling Program	Old and broken small appliances ranging in size from toasters and electric toothbrushes to countertop microwaves and vacuum cleaners. Power tools, sewing machines, electrical exercise and sporting equipment, and other electrical products.

APPENDIX 2

Breakdown of potential diversion rates

* In 2014, the total solid waste disposed was 51,217 tonnes¹

* The self-haul rate is 15% of the total RDN solid waste stream²

Therefore:

15% of 51,217 t = 7683 tonnes of self-haul waste in 2014

* 6.1% of the self-haul waste was recyclable items in 2012³

With 25% and 50% projected recovery rates for EPR items:

25% of 6.1% = 1.5%

1.5% of 7680 = 115 tonnes of recyclable items in the self-haul waste stream

115 tonnes of 51,217 tonnes of total waste = 0.23% of waste may be diverted

Or

50% of 6.1% = 3.05%

3.05% of 7683 = 234 tonnes of recyclable items in the self-haul waste stream

234 tonnes of 51,217 tonnes of total waste = 0.46% of waste may be diverted

¹ RDN Scalehouse data (2014)

² RDN Scalehouse data (2014)

³ Walker, Maura and Associates. *Solid Waste Composition Study Report (2012) Table 3*, <http://rdn.bc.ca/cms/wpattachments/wpID1602atID5945.pdf> Accessed August 20, 2015

APPENDIX 3

Rebate Values

Program	Items Collected	Rebate
Regeneration		
AlarmRecycle	CO2 alarms, smoke alarms	\$50/box (1'x1')
CESA ElectroRecycle	Small appliances	\$209/tonne
Light recycle	Residential lighting, fixtures, flashlight	Rebate per box (value unavailable at this time)
ProductCare	Paint, varnishes, wood preservatives, paint cans	\$45/tubskid (~4'x4')
ProductCare	Household hazardous waste	\$120/tubskid (~4'x4')
Encorp Return-It Electronics ⁴	Household electronics	\$200/tonne
Call2Recycle	Batteries, cell phones	Small collection: \$0 Medium collection 20-30 palletized boxes per 1-3 months: \$0.22/kg Large collection 2 or 3 palletized drums per year: \$0.38/kg (drums not included)
Recycle my Cell	Cell phones and their batteries	Non-working cell phones \$1.00/2.2kg Working, newer models \$1 - \$120 depending on model No rebate for chargers or batteries
Switch the 'Stat	Residential thermostats	No rebate
Tire Stewardship BC	Off rim vehicle, bike, motorcycle tires	No rebate
BC Used Oil Management Association	Oil, oil filters, oil containers, antifreeze and antifreeze containers	Oil: \$0.10/L Antifreeze: \$0.15/L No rebate on containers
MMBC		
Plastic Bags	Plastic bags and overwrap	\$505/tonne baled
Styrofoam	Household Styrofoam packaging	\$505/tonne baled or densified
Glass	Household non-refundable glass	\$80/tonne

⁴ Rebate information for Encorp Electronics is approximate

APPENDIX 4

Rebates

Breakdown of potential rebates based on a Per capita basis

*2013 rebate value for EPR Programs at the Capital Regional District was \$139,461

* CRD population 359,991

$\$139,461/359,991 = \0.39 rebate per capita CRD

*RDN population 146,574

$\$0.39 * 146,574 = \$57,163.86$ potential RDN rebate based on population

Breakdown of potential rebates based on CRD EPR tonnages⁵

	CRD Hartland ⁶	Approximate RDN tonnage based on CRD population			
Population	359 991	146 574			
EPR Program	Tonnes Collected 2013	RDN Potential tonnage	Rebate	Unit	Total
Batteries t/person	40 0.000111	16	\$220.00	Tonne	\$3600
Electronics ⁷ t/person	293 0.000814	119	\$200.00	Tonne	\$24 900
Plastic film t/person	7 1.94449E-05	3	\$505.00	Tonne	\$1400
ProductCare: paint, pesticides /solvents, residential lighting #tubskids @~261kg each t/person	166 636 0.000461	67 258	\$45.00	Tubskid (4'x4' bin)	\$11 600
Small appliances/ tools t/person	131 0.000364	53	\$209.00	Tonne	\$11 100
Styrofoam t/person	20 5.55569E-05	8	\$505.00	Tonne	\$4100
Used Oil (Litres)	28 000	11 400	\$0.10	L	\$1600
Used Antifreeze (Litres)	3657	1490	\$0.15	L	\$200
Regional District of Nanaimo Potential EPR Rebate					\$58 500

⁵ Totals have been rounded to the nearest \$100

⁶ Capital Regional District. *Environmental Resource Management Annual Report (2013)* <https://www.crd.bc.ca/docs/default-source/crd-document-library/annual-reports/solid-waste/2013-erm-annualreport-web.pdf?sfvrsn=4> Accessed September 3, 2015

⁷ Rebate information for electronics is approximate