TETRA TECH

TECHNICAL MEMO

ISSUED FOR REVIEW

To:	Tauseef Waraich Harmony Huffman	**Date:**	May 2, 2018
c:		**Memo No.:**	2
From:	Melissa Nielsen Wilbert Yang	**File:**	704-SWM.PLAN03006-01
Subject:	Preliminary Options for Consideration for Plan Update		

This 'Issued for Review' document is provided solely for the purpose of client review and presents our interim findings and recommendations to date. Our usable findings and recommendations are provided only through an 'Issued for Use' document, which will be issued subsequent to this review. Final design should not be undertaken based on the interim recommendations made herein. Once our report is issued for use, the 'Issued for Review' document should be either returned to Tetra Tech Canada Inc. (Tetra Tech) or destroyed.

1.0 INTRODUCTION

The Cowichan Valley Regional District (CVRD) retained Tetra Tech Canada Inc. (Tetra Tech) to support the review and update of the CVRD's Solid Waste Management Plan (SWMP). The 2018 Draft SWMP Update will review existing solid waste management policies and programs; identify and evaluate options for reduction and diversion, residual management, and financing; and set the regional district's waste management principles, targets and strategies for the next ten years. A summary of the project phases that encompasses solid waste management planning process is included in Table 1-1.

Table 1-1: Project Deliverables

Phase		Deliverable
1	Initiate the Planning Process	▪ Technical Memorandum (Tech Memo) 1 - Current Solid Waste Management System Overview
2	Set the Plan Direction	▪ Consultation Plan ▪ Tech Memo 2 - Options: 3 R's and Residual Management (this document)
3	Evaluate Options	▪ Tech Memo 3 - Finances and Option Selection
4	Prepare and Adopt the Plan	▪ Draft Solid Waste Management Plan ▪ Consultation Summary Report
5	Plan to Implement, Monitor, and Report	▪ 2018 Solid Waste Management Plan

Phase 1 (Initiation) included the Current Solid Waste Management System Overview (Tech Memo 1) that was presented at the Plan Advisory Committee (PAC) meeting on March 29, 2018. The technical memorandum documents the current condition of the CVRD's solid waste management system, and provides a basis for the options presented herein. This document is the second technical memorandum (Tech Memo 2) created for the SWMP process (as described in Table 1-1).

1.1 Purpose

The purpose of this tech memo is to present all options identified in a gap analysis for further review.

To determine areas for focus for the Plan Update, the following steps will be completed:

1. The CVRD and the PAC will review Guiding Principles for the Plan Update, which will be used as evaluation criteria for option selection. Eight Guiding Principles have been established by the Ministry (Section Figure 1-1); it will be determined whether any CVRD-specific Guiding Principles should be considered.

2. The CVRD and the PAC will discuss and consider a long list of options (herein).

3. The CVRD and Tetra Tech will evaluate the long list of options according to the Guiding Principles and input from the PAC and the public. This should result in a preliminary short-list of options.

4. The CVRD and the PAC will discuss and approve the short-list of options.

The next and final technical memorandums will assess the financial implications and synergies of the short-listed options for integration into the 2018 SWMP Update.

Concurrently with the Options Selection process (Phases 2 and 3 in Table 1-1), public consultation will be undertaken via an open house and a survey.

Once the options have been analyzed and selected, an initial draft SWMP will be developed and presented for more public consultation. Important considerations include adequate engagement with CVRD stakeholders which range from the public, the private sectors and through to First Nations. An updated 2018 SWMP will be crafted based on the outcomes of the previous deliverables, including a consultation summary.

1.2 Guiding Principles

The Ministry released a planning guide entitled, “A Guide to Solid Waste Management Planning” (Guide) in 2016. This Guide will help direct the CVRD’s solid waste management planning process.

In this Guide, the Ministry identified eight Guiding Principles, presented in Figure 1-1. The Ministry states that the SWMP should be updated based on locally-relevant Guiding Principles, which are clearly stated in the Plan. It is expected that the CVRD’s Plan Update will use a similar set of Guiding Principles to those presented in Figure 1-1. These principles will be discussed with the PAC and will be highlighted as a topic for the public consultation process.

- Promote zero waste approaches and support a circular economy
- Promote the first 3 Rs (Reduce, Reuse and Recycle)
- Maximize beneficial use of waste materials and manage residuals appropriately
- Support polluter and user-pay approaches and manage incentives to maximize behaviour outcomes
- Prevent organics and recyclables from going into the garbage wherever practical
- Collaborate with other regional districts wherever practical
- Develop collaborative partnerships with interested parties to achieve regional targets set in plans
- Level the playing field within regions for private and public solid waste management facilities.

Figure 1-1: Provincial Guiding Principles

1.3 Waste Prevention Hierarchy

The waste prevention hierarchy (Figure 1-2) is a useful tool when evaluating options to improve a solid waste management system and is foundational for the CVRD's SWMP Update.

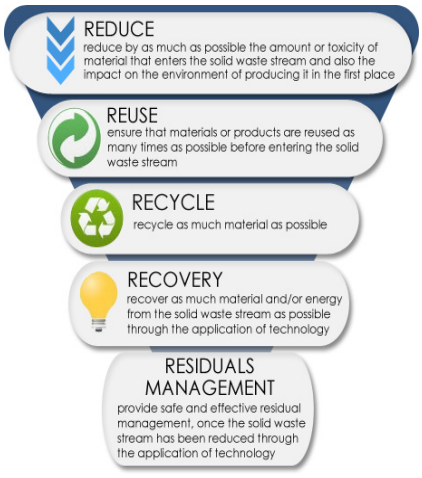

Figure 1-2: Waste Prevention Hierarchy

Source: (BC Ministry of Environment and Climate Change Strategy, n.d.)

Where practical and feasible, it is preferable to undertake actions higher on the hierarchy scale (i.e. reduce and reuse) than to explore other waste management strategies (recycle, then recover, then residuals management). The latter options should be examined once the earlier options have been exhausted.

The benefits to this approach are as follows:

- **Actions taken at higher levels in the waste prevention hierarchy can eliminate or reduce the environmental management costs of actions at lower levels**. For example, waste prevention programs can reduce the amount of waste that would be handled thereby reducing waste management costs.

- **The waste prevention hierarchy can also reduce the environmental impacts of product manufacturing and distribution.** For example, reuse (and, to a lesser degree, recycling) will reduce the demand for and thus environmental impact of extracting and processing virgin resources, while the use of recycled materials can reduce the energy cost for virgin inputs needed to manufacture new products.

In this technical memorandum, options are listed in the same order as the waste prevention hierarchy.

1.4 Goals

A SWMP should clearly outline goals for the duration of the plan. Although the plan outlines strategies for the next ten years, it is important to take into considerations overarching initiatives that may span over twenty or thirty years. The Ministry has defined the following goals for British Columbia to achieve by 2020:

- 75% of BC's Population covered by Organic Waste Disposal Restrictions;
- 75% Recovery of Materials Covered by Extended Producer Responsibility Programs (EPR); and
- Provincial Disposal Rate of 350 kg per capita per year.

With a disposal rate of 358 kg per capita, the CVRD is at the forefront of meeting the Ministry's Provincial goals. EPR programs are active in the CVRD and it needs to be determined whether 75% of EPR materials are being recovered. Businesses and institutions in the CVRD are covered by an organic waste disposal restriction and most residents in the CVRD are serviced with curbside collection programs for organic materials, however, there is no residential organic waste disposal restriction. Thus, this Plan will need to consider whether more ambitious goals should be pursued. Suggested goals for this plan update include:

- Adopt "Zero Waste" as a goal for the plan (see Section 1.4.1);
- Target a Regional Disposal Rate of 180 to 300 kg per capita per year by 2030; and/or
- Target that 90% all residents and businesses have minimum service levels (e.g., recycling and organics collection) by 2025.

1.4.1 Zero Waste

"Zero Waste" is a goal that several BC regional districts have adopted, including the Regional District of Nanaimo (RDN), Metro Vancouver, and the Regional District of Kootenay Boundary.

Zero Waste is a visionary goal intended to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means moving towards a circular economy, wherein 'waste' is viewed as a resource, and maximum value is extracted from all resources before they are eventually recovered or regenerated[1].

A Zero Waste goal suggests a move towards the systematic redesign and management of products and processes to avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. The ultimate realization of Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.[2]

[1]WRAP UK, http://www.wrap.org.uk/about-us/about/wrap-and-circular-economy
[2] Zero Waste International Alliance, http://zwia.org/standards/zw-definition/

2.0 AREAS FOR IMPROVEMENT

While the CVRD is a leader in waste management, there are several areas where improvements can occur. Many of these were identified during a 2017 waste composition study.

2.1 Waste Disposal by Sector

The Ministry established waste disposal reporting as an annual requirement for regional districts and set a provincial target of 350 kilograms (kg) per capita per year to be achieved by 2020.

While the CVRD is one of the highest performing regional districts in the Province and is on track to achieve the target disposal rate of 350 kg per capita by 2020, there are opportunities to increase waste diversion in the region even further. Furthermore, the 350 kg per capita disposal rate is a target for 2020, and the CVRD's Plan Update should be mindful that strategies should extend beyond 2028.

Waste management programs are often developed for specific sector(s); thus, it is useful to analyze the materials in the waste stream according to which sector it originated from and the collection approach for those materials. The by-sector disposal tonnage information for the CVRD is presented in Table 2-1.

Table 2-1: Quantities of CVRD Waste by Sector

Sector	Quantity of Disposed Materials (tonnes)	Percent of Total Waste
Single Family (municipalities)	2,600	9%
Single Family (Electoral Areas)	4,100	14%
Multi-Family	1,700	6%
Industrial, Commercial, and Institutional	12,800	42%
Drop-off	3,600	12%
Construction and Demolition	5,300	18%
Total Materials	**30,100**	**100%**

2.2 Diversion Potential

This section uses waste composition data to present the amount of potentially divertible material still in the garbage. This section considers two factors when discussing divertability:

- **Material Grouping.** Table 2-2 presents how material types were grouped for the diversion potential analysis. These groupings reflect groups of materials that are managed in a particular way – for example, material that is collected via curbside recycling is grouped together, since these materials could be targeted through improved residential recycling programs, and wasted food is separated from inedible organic materials, since wasted food may be targeted through waste reduction programs, while inedible organic materials may be targeted through organics diversion programs.

- **Sector.** Waste from each sector typically has a distinct composition profile and would be targeted by different programs. Table 2-3 presents the material groupings according to the following sectors:

  - Single Family (Municipalities);
  - Single Family (Electoral Areas);
  - Multi-Family;
  - Industrial, Commercial, and Institutional;
  - Self-hauled Waste; and
  - Construction and Demolition Materials.

Table 2-2: Material Groupings

Category	Included Items (e.g.)
Curbside Recyclable Material (EPR)[1]	Packaging and Printed Paper Materials that are collected from the residential sector (Managed by Recyclable BC)
ICI Recyclable Materials[1]	Packaging and Printed Paper Materials from the commercial sector
Depot Recyclable Material (EPR)	Deposit Containers, Electronics, Batteries, Used Oil, and Containers, etc.
Wasted Food	Edible or donatable food
Inedible Organic Materials	Inedible food scraps, yard waste, and compostable paper
Recyclable C&D Materials	Cardboard, Drywall, Masonry (concrete/asphalt), Clean Wood, and Metals
Textiles	All textiles
Bulky Objects	Furniture and Mattresses

[1]Curbside Recyclable Material and ICI Paper and Printed Packaging are the *same materials*. In the residential sector, these materials are managed by Recycle BC. In the ICI sector, materials are not managed by a product stewardship program.

Table 2-3 presents the potential waste diversion according to material categories and sector. The purpose of this table is to assist in understanding:

- Areas with room for improvement which could be targeted by programs outlined in the SWMP; and
- The effect that waste reduction and diversion programs could have on the overall waste stream, including the effect that they could have on diversion and disposal rates.

Table 2-3: Potential Waste Diversion

Sector	Contribution to Landfill by Sector (percent and tonnes)	Material Type	Material Contribution to Landfill (tonnes)[1]	Current CVRD Disposal = 358 kg/capita Provincial Goal = 350 kg/capita CVRD Goal = 250 kg/capita by 2025 (to be confirmed) Target Disposal Rate (kg/capita)			
				325	300	250	150
				16% of divertable materials is removed from the current waste stream	28% of divertable materials is removed from the current waste stream	50% of divertable materials is removed from the current waste stream	97% of divertable materials is removed from the current waste stream
Single-Family (Municipalities)	9% (2,600)	Curbside Recyclable Material	269	54	75	134	261
		Depot Recyclable Material (EPR)	204	41	57	102	198
		Wasted Food	322	64	90	161	313
		Inedible Organic Materials	463	93	130	232	449
		Recyclable Building Materials	71	14	20	35	69
		Textiles	204	41	57	102	198
		Bulky Objects	4	1	1	2	4
Single-Family (Electoral Areas)	14% (4,100)	Curbside Recyclable Material	326	65	91	163	316
		Depot Recyclable Material (EPR)	274	55	77	137	266
		Wasted Food	797	159	223	399	773
		Inedible Organic Materials	975	195	273	487	945
		Recyclable Building Materials	173	35	48	86	168
		Textiles	279	56	78	139	270
		Bulky Objects	0	0	0	0	0
Multi-Family	6% (1,700)	Curbside Recyclable Material	253	51	71	126	245
		Depot Recyclable Material (EPR)	165	33	46	83	160
		Wasted Food	292	58	82	146	284
		Inedible Organic Materials	376	75	105	188	365
		Recyclable Building Materials	27	5	8	14	26
		Textiles	89	18	25	44	86
		Bulky Objects	0	0	0	0	0
Industrial, Commercial, Institutional	42% (12,800)	ICI Paper and Printed Packaging	1,627	325	456	814	1,578
		Depot Recyclable Material (EPR)	709	142	198	354	688
		Wasted Food	4,400	880	1,232	2,200	4,268
		Inedible Organic Materials	2,302	460	644	1,151	2,233
		Recyclable Building Materials	326	65	91	163	316
		Textiles	569	114	159	284	552
		Bulky Objects	52	10	15	26	50
Self-hauled Waste	12% (3,600)	Curbside Recyclable Material	184	37	51	92	178
		ICI Paper and Printed Packaging	0	0	0	0	0
		Depot Recyclable Material (EPR)	282	56	79	141	273
		Wasted Food	74	15	21	37	72
		Inedible Organic Materials	105	21	29	53	102
		Recyclable Building Materials	691	138	193	345	670
		Textiles	275	55	77	138	267
		Bulky Objects	465	93	130	233	451
Construction and Demolition Materials	18% (5,300)	Curbside Recyclable Material	46	9	13	23	44
		ICI Paper and Printed Packaging	0	0	0	0	0
		Depot Recyclable Material (EPR)	120	24	34	60	116
		Wasted Food	0	0	0	0	0
		Inedible Organic Materials	61	12	17	30	59
		Recyclable Building Materials	46	9	13	23	45
		Textiles	61	12	17	30	59
		Bulky Objects	175	35	49	87	169
Disposal Reduction (tonnes) from 30,100				**3,626**	**5,077**	**9,066**	**17,588**
Resulting Per Capita Disposal Rate (kg/capita) from 358 kg/capita				**325**	**300**	**250**	**150**

[1]Red cells indicate a large diversion potential (greater than 500 tonnes); orange cells indicate a medium diversion potential (200 to 500 tonnes)

3.0 OPTIONS FOR CONSIDERATION

Options presented below take into consideration the existing solid waste management system and are presented in order of the waste prevention hierarchy.

3.1 Reduce, Reuse, and Recycle

This SWMP review process has identified issues and associated program and policy options available to reduce the current CVRD 358 kilogram per capital disposal rate. The issues and options are summarized below.

3.1.1 Option 1: Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional (ICI) Sectors

Issues:

- There is approximately 1,400 tonnes of edible and donatable food being wasted by the residential sectors (single family and multi-family).
- There are approximately 3,100 tonnes of edible food and 1,300 tonnes of donatable food being wasted by the ICI sector.

These numbers reflect the food currently being landfilled. Since municipalities in the CVRD have mature, well-established food scraps collection programs, thus, it is likely that edible or donatable food is also recycled in municipal curbside organics programs. Therefore, the amount of edible and donatable food wasted overall is at least 6,700 tonnes. The production of wasted food is estimated to release 1,600 kg of CO_2 per tonne of wasted food.

A. Promote Residential Food Waste Reduction

Food waste reduction and rescue has become paramount in recent years. The United Nations Food and Agriculture Organization (FAO) estimate that a third of food produced for human consumption is lost or wasted globally, amounting to 1.3 billion tonnes per year. In British Columbia, the Ministry developed food waste reduction tools[3] for residential and commercial sectors including a *Food Waste Reduction Toolkit* tailored to municipalities.

The CVRD could consider adopting a well-established residential food waste prevention campaign such as “Love Food Hate Waste”. This program was designed by Waste and Resources Action Programme (WRAP – an UK organization) and is being utilized by several Canadian municipalities. The National Zero Waste Council adapted the “Love Food Hate Waste” program for Canadian municipalities and has resources available to share with participating jurisdictions[4]. The national launch of “Love Food Hate Waste” is planned for May 2018. It is designed to raise awareness to reduce the amount of wasted food by partnering with business and government to design and implement campaigns and tools to actively promote behaviour change. CVRD could consider participating in Love Food Hate Waste as a local implementing partner.

[3] BC Ministry of Environment and Climate Change Strategy, 2017. Food Waste Reduction Tools & Resources. http://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/organics/tools-resources

[4] Metro Vancouver, 2017. Love Food Hate Waste Canada. http://www.lovefoodhatewaste.ca

B. Build Local Food Rescue Capacity for the ICI Sector

The CVRD could move towards improved food rescue capacity through the following actions:

- Convening with stakeholders who may have a surplus or shortage of food (e.g. large food producers and food banks);
- Creating a database of stakeholders who may have a surplus or shortage of food;
- Advocating to provincial and federal governments for a tax incentive to encourage businesses to donate surplus food;
- Creating toolkits and platforms that allow businesses and residents to learn how surplus food can be donated and utilized;
- Collaborating with Island Health (Health Authority) to define safe food donation practices; and
- Collaborating with local non-profit organizations dedicated to food rescue.

3.1.2 Option 2: Explore Reduction and Reuse Opportunities

Issues:

- There are opportunities to enhance the CVRD's programs at the top of the waste prevention hierarchy (reduction and reuse) to reduce waste, associated environmental impacts and financial implications.

A. Enhance and Improve Local Reuse Opportunities

Free stores are located at all CVRD Recycling Centres, where residents pay standard tipping fees to drop off items but may take items for free. There are also local reuse opportunities through online platforms such as UsedCowichan and Kijiji.

Other platforms for reuse could also be explored, such as repair cafes, tool libraries, or building supply reclamation. The CVRD could support these programs through:

- Collaborating with municipalities on zoning for these types of spaces and/or businesses to reduce barriers for entrepreneurs and residents to set up these types of organizations;
- Providing grants for organizations to implement these initiatives; and
- Convening with stakeholders working in this space to identify opportunities for expansion.

B. Consider Mechanisms to Ban Single-Use Plastic Bags or Other Single-Use Items

In January 2018, the City of Victoria adopted a new Checkout Bag Regulation Bylaw, wherein businesses are not allowed to sell or provide customers with single-use plastic bags. Similarly, the City of Vancouver is developing a Single-Use Item Reduction Strategy that explores waste reduction approaches for disposable cups, bags, and takeout containers.

The CVRD could explore similar mechanisms, adopt policies or develop mandates to ban or reduce the use of Single-Use items.

3.1.3 Option 3: Improve Multi-Family Residential and ICI Recycling

Issues:

- "Blue box" materials make up 13% of the ICI disposal stream and 15% of the multi-family disposal stream (compared to 9% in the single-family sector);
- Compostable organic materials make up 52% of the ICI disposal stream and 39% of the multi-family stream (compared to 23% from the single-family sector that have garbage, recycling, and organics collection);
- The multi-family sector annually disposes approximately 250 tonnes of "blue box" material and 670 tonnes of organic materials;
- The ICI sector annually disposed of 1,630 tonnes of "blue box" material and 6,700 tonnes of organic materials; and
- Nearly one-third (9,250 tonnes) of the waste disposed is recyclable or compostable material from the multi-family and ICI sectors.

A. Mandate Multi-Family Source Separation Requirements

Adopt policies and update existing bylaws that require waste haulers to service multi-family buildings with recycling and organics collection. These types of source separation requirements exist in almost all municipalities in Metro Vancouver. As a part of this option, enforcement measures may be considered, such as waste audits of generators, bin checks, cameras on collection vehicles, and surcharges for not having all collection services in place.

B. Mandate ICI Source Separation Requirements

Adopt policies and update existing bylaws that require haulers to service ICI customers with recycling and organics collection. As a part of this option, enforcement measures may be considered, such as waste audits of generators, bin checks, cameras on collection vehicles, and surcharges for not having all collection services in place. Also as part of this option, the materials for source separation should be discussed.

C. Provide for Collection Services to Multi-Family and ICI Sectors

Explore opportunities to ensure equitable services to all sectors, such as bylaw changes to require services for all multi-family and/or ICI sectors.

D. Enforcement of Material Disposal Bans

The CVRD has material disposal bans in place for recyclable and commercial organic materials. Stricter enforcement of these bans can improve adherence to bylaws. In communities that enforce material disposal bans and apply surcharges for non-compliance, haulers would be fined for loads containing a certain amount of the banned materials. These enforcement actions can be motivated haulers to work with their customers to provide adequate service levels and public education. Customers who resist adopting the new services would be charged a higher rate that would account for financial penalties.

3.1.4 Option 4: Provide Equal Access to Publicly-Funded Infrastructure

Issues:

- Most residents in the South End of the regional district (over 30,000 residents in Electoral Areas A, B, and C, and D) are not within a 15-minute drive of a publicly funded Recycling Centre or solid waste facility.
- Residents in these Areas and in Electoral Area H are also not provided with curbside garbage collection by the CVRD.
- Over 33,000 Rresidents in the CVRD (mostly living in Electoral Areas) do not have public sector organics collection. Residents in areas with *no* organics collection, either public or private, have 13% more organics in the garbage than in areas with organics collection.

A. Develop a Public Recycling Centre in the South End

The 2006 SWMP included a plan to develop a public drop off depot in the south end of the CVRD, to service Electoral Areas A, B, and C. This initiative is on-hold because the siting efforts were unsuccessful in 2011. The CVRD has an agreement with Fisher Road Recycling in Cobble Hill that allows south end area residents to drop off recyclables such as packaging and printed paper for free, and yard waste at Central Landscape Supplies for free.

An analysis could be completed to determine whether a public south-end facility could be built or purchased. This analysis should include community consultations to determine:

- The desire for a public drop-off facility;
- Understanding of community's preference for a public south-end depot versus expanded curbside collection; and
- The willingness to fund a public drop-off facility.

B. Expand Agreements between CVRD and Private Facilities in the South End

As noted above, the CVRD currently has agreements with private facilities to service the south end of the regional district so that residents may drop off yard waste and recyclable materials that are managed by Recycle BC (Packaging and Printed Paper) for free. However, for other items, residents must pay a $5 minimum drop off fee. The CVRD could explore expanding this agreement so that residents in the south end have access to the same service levels as residents who use CVRD Recycling Centres and do not pay a minimum drop off fee for recyclables.

C. Implement Universal Garbage Collection in all Electoral Areas

An alternative way to provide garbage and recycling services to the south-end may be to implement universal garbage collection. If this option is chosen for further investigation, public consultation will be undertaken to determine whether universal curbside collection is desired in the Electoral Areas that do not currently have these programs.

D. Provide CVRD Organics Collection to all Electoral Areas

The 2017 waste composition study showed that households with curbside organics collection have less organics in the garbage, as presented in Table 3-1. The differences in composition is primarily due to increased food waste (and not due to yard waste from larger rural properties).

Table 3-1: Correlation of Organics in Garbage to Varying Service Levels

Service Level Description	Areas	Proportion of Organics in Garbage
Mandatory organics collection	All municipalities	23%
Optional organics collection	Electoral Areas A-C	30%
No organics collection	Electoral Areas D-I	36%

3.1.5 Option 5: Improve Organics Processing

Issues:

- Organics processing and diversion is one of the main reasons for high diversion rates in the CVRD.
- There are several organic processing facilities in the CVRD and many are generating unacceptable odour that are impacting residents and businesses.
- Amount of organics being continues to grow as more organics from outside the being brought into facilities in the CVRD.
- Facilities that process more organics than they were designed to receive are susceptible to odour incidents. Odour complaints have been an issue in recent years in several nearby regional districts such as Metro Vancouver, Capital Regional District, and Regional District of Nanaimo. Unacceptable odour incidents have led to closure of several organic processing facilities in the last five years using various instruments.
- Organics processing facilities are regulated under the Provincial Organic Matter Recycling Regulation (OMRR) and the CVRD licences solid waste management facilities such as composting facilities.

A. Ensure Use of Best Management Practices for Odour Management

Work with private and public processors to conduct best available control technology (BACT) assessments and explore opportunities to incorporate advanced processes or technologies for organics processing that may reduce odour impacts to the environment.

B. Prohibit Out-of-Region Organics Processing in CVRD

Limiting the quantity of organics being processed in the region should reduce the potential impact from odours. The CVRD could consider restricting local processing capacity so that only materials from the CVRD would be allowed to be processed. There are currently no regulations to prevent organic materials from crossing regional district borders anywhere in British Columbia, and nearby regional districts have been unsuccessful in implementing this type of material flow regulations, so this would be a difficult undertaking.

C. Standardize Design Criteria and Limits to Protect Environment and Public

Develop design criteria and emission/odour limits to ensure odours are not impacting the environment and public. Since there are standards that may apply from the BC Ministry of Environment, these standards would be over and above the provincial requirements.

D. Build an Organics Processing Facility

Private organics processing facilities may have outgrown their premises or the community has grown around them. To ensure there is adequate organics processing capacity in the regional district, it might be reasonable for the public sector to help relocate or build an organics processing facility in an area that is large enough and far away

enough from potential receptors. An organics processing facility could also be built through a public-private partnership.

E. Purchase a Wood Chipper for Curbside Services

In some rural areas in the CVRD, residents burn yard waste, which can lead to air quality issues. The CVRD may wish to purchase a wood chipper which could be provided as an occasional, seasonal curbside service in rural areas. In this scenario, participating residents would receive free wood chips (i.e. mulch), a useful material, in exchange for their yard waste.

F. Increase Use of Backyard Composters

The CVRD previously held an annual sale of subsidized backyard composters; however, sales began to dwindle in 2012 with the implementation of curbside organics collection in member municipalities. Eventually, sales were discontinued although backyard composters are still available for purchase at several local hardware stores. The CVRD may consider holding a similar sale in the future, or implementing a campaign to educate the public about backyard composting.

3.1.6 Option 6: Investigate Processing and Transfer Capacity for Recyclables

Issues:

- Most recyclable materials in the region were previously hauled to the Vancouver Island Recycling Centre which was located in the CVRD. This facility has since closed, and materials are hauled to out of region to material recovery facilities (MRFs) in either the Capital Regional District (Victoria) or the Regional District of Nanaimo (Nanaimo).
- There are no facilities in the CVRD that accept comingled ICI recyclable materials and this material is typically hauled out-of-region or not collected at all because there is no local drop off location.

A. Investigate Feasibility of a Material Recycling Facility (MRF)

Determine whether it is feasible and necessary to build a MRF in the CVRD.

B. Determine Feasibility of Creating ICI Transfer Capacity for Recyclables

Recyclables from the residential sector are taken to the Bings Creek Transfer Station. The CVRD could investigate options for the most feasible or cost-effective approach for managing ICI recyclables. This may include a feasibility study to assess the logistics and costs to accept comingled ICI recyclable materials at Bings Creek Transfer Station or at a private sector facility.

3.1.7 Option 7: Improve Management of Construction and Demolition (C&D) Materials

Issues:

- There are no programs that mandate recycling of C&D materials in the CVRD.
- There is limited disposal capacity for hazardous C&D materials (asbestos, gypsum wallboard) and the material is costly to manage and properly dispose.

A. Monitor C&D Disposal and Recycling Activities in the Region

C&D waste typically represents 25% to 35% of the waste stream, and recyclability of this material is typically in the order of 70% to 80%. The CVRD should conduct a C&D waste system analysis to determine how residents and businesses are managing C&D waste, where it is taken to and available capacity for managing this waste stream. This study can also assess the current recycling/waste diversion activities in the region and whether there is a need to develop mechanisms to further divert C&D materials from disposal.

B. Mandate Diversion Targets for C&D Materials

When there are suitable options for diverting C&D materials, some municipalities impose minimum diversion targets that would become a condition/requirement for issuance of demolition and building permits.

C. Mandate that all C&D Materials be taken to Permitted Facilities

As part of the building and demolition permit process, a condition of those permits can include taking C&D materials to authorized C&D facilities that would focus on recycling or diverting C&D materials from disposal.

D. C&D Waste Management Strategy

As part of the SMWP update, the CVRD could undertake a planning process to develop a C&D waste management strategy for the region. This would take into consideration the results from the C&D waste system analysis, consult with key stakeholders (i.e. construction industry, C&D waste processor, waste haulers, municipalities, etc.) and develop a strategy that follows the goals and principles of the SWMP.

E. Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)

Asbestos and gypsum wallboard may currently be disposed at Coast Environmental (Duncan and Chemainus locations). However, it is expensive for residents to dispose of these materials. The CVRD may consider reducing barriers to legally disposing of these materials by providing a disposal subsidy.

3.1.8 Option 8: Advocate for Expansion of EPR Programs

Issues:

- The CVRD currently accepts mattresses and bulky furniture at Bings Creek for recycling, however, recycling of these items is currently funded through tipping fees because there are no EPR programs for these items.
- 579 tonnes of textiles are disposed by the residential sector and 569 tonnes are disposed by the ICI sector. These materials are recyclable but are not managed by an EPR Program.

A. Advocate to the Ministry to Expand EPR Programs to these Materials

The Canadian Council for Ministers of the Environment (CCME) continues to provide guideline updates for Canada-wide implementation of EPR programs. Products not yet in the BC Recycling Regulation that are recommended for Canada-wide EPR include carpet, textiles, and furniture. CVRD can continue to stay abreast of industry trends through conferences and annual updates as provided by the CCME and the BC Product Stewardship Council (BCPSC). There is also an opportunity to advocate for new programs through direct correspondence with the Ministry or through associations of which CVRD is a member (e.g. British Columbia Product Stewardship Council).

The CVRD currently accepts mattresses and bulky objects at Bings Creek and has a contract with a private facility to process these materials. More than 12,000 mattresses have been collected since the program's implementation in 2012. The CVRD funds this recycling by charging high tipping fees for these materials. The CVRD's management of materials such as mattresses and bulky furniture presents an opportunity to justify the expansion of EPR to these materials.

3.2 Recovery and Residuals Management

3.2.1 Option 1: Explore Options for Local Disposal

Issues:

- The CVRD has one of the highest tipping fees in British Columbia.
- The solid waste is exported to the Roosevelt Regional Landfill in Washington State, and the CVRD is responsible for transportation costs and the USD exchange rates.

Shipping waste across the Canada-USA border has many risks including fluctuation of the exchange rate, challenges with marine traffic and potential border restrictions. The CVRD maintains a contingency disposal agreement with the Regional District of Nanaimo in the event exporting waste to the designated disposal facility is disrupted. It is recommended that the options for local disposal presented in Table 3-2 are explored. These options are not an exhaustive list. To ensure the efficiency of the disposal system, the CVRD should continue to explore the feasibility of alternative disposal mechanisms as opportunities arise.

Table 3-2: Options for Local Disposal

Option	Description
Status Quo	Currently, waste is placed in shipping containers, ferried to the mainland, transported by rail to Southeastern Washington State, and taken to the Roosevelt Regional Landfill for disposal. The empty shipping containers are brought back to the CVRD to be filled with waste again. This disposal program costs approximately $130/tonne.
Disposal at Comox Valley Regional Landfill	A new landfill was recently opened in Comox Valley. Preliminary conversations have indicated that the Comox Valley Regional District may be open to receiving waste from the Cowichan Valley Regional District. The feasibility of disposal at the Comox Valley Landfill should be explored.
Waste to Energy (Public Facility)	Two recent studies reviewed the feasibility of a Waste to Energy (WTE) facility for southern Vancouver Island. Both studies determined that viable technology exists but is not economically feasible. However, the 2018 SWMP could revisit the creation of WTE infrastructure in the CVRD if it is desired by the PAC and public.
Waste to Energy (Private Facility)	It is possible that a new private WTE facility may be built within the Cowichan Valley. The feasibility of disposal at this potential WTE facility should be explored.
New CVRD Landfill Development	The CVRD tried to site a landfill in the mid-1990s. An appropriate site was not found; thus, waste has since been exported out of region. If it is desired by the PAC and the public, an initiative for the 2018 SWMP could be to site and build a new landfill.

3.2.2 Option 2: Reduce Illegal Dumping

Issues:

- Illegal dumping of materials occurs throughout the CVRD.

A campaign was conducted in 2016 to reduce illegal dumping in the Hillcrest Road area. Additionally, a "Free Tipping" policy was implemented in the early 2000s which provides financial incentives to non-profit organizations for cleaning up public lands or for appropriately disposing of waste dumped on their property.

However, illegal dumping continues to be a problem. The CVRD may wish to analyze the costs and ubiquity of illegal dumping to determine whether changes need to be made to the current system.

3.2.3 Option 3: Improve Collection of Materials which are Difficult to Dispose

Issues:

- The CVRD has no options for residents to safely dispose of household hazardous materials which are not managed by an EPR program.
- The CVRD does not have subsidized collection for bulky items, such as furniture and mattresses, which may contribute to illegal dumping.

A. Accept Household Hazardous Materials at CVRD Recycling Facilities

The CVRD could begin to accept household hazardous materials (which are not managed by an EPR program) at CVRD Recycling Facilities. This could be implemented on a periodic (annual or seasonal) or year-round basis. The CVRD may also wish to create agreements (or expand existing agreements) with private facilities to subsidize them to accept these materials.

B. Implement Occasional Curbside Collection for Bulky Items

The CVRD could implement a curbside collection system for bulky items, wherein residents could call the CVRD up to given number of times (usually two or three) per year to have their bulky items collected. If this option is chosen for further review, it would need to be determined whether this would be in place throughout the CVRD or in Electoral Areas only. If this service was to be offered in municipalities, it would need to be determined whether this service would be offered by municipalities or by the CVRD.

3.2.4 Option 4: Monitor Historic Disposal Sites

Issues:

- The CVRD has a number of closed disposal sites that require ongoing monitoring and attention: Koksilah Sanitary Landfill, Koksilah Road Incinerator Ash Landfill, Peerless Road Incinerator Ash Landfill, and Meade Creek Incinerator Ash Landfill (ash landfill closure is in progress at the time of writing).

The CVRD needs to continue monitoring and assessing the state of these historic disposal sites and implementing measures that minimize potential impacts to the environment. These sites should have annual resources to monitor and address potential concerns. Monitoring requirements should continue unless it can be demonstrated that these sites are no longer an environmental concern.

3.3 Operational Improvement

3.3.1 Option 1: Bings Creek Transfer Station 10-Year Plan

Issues:

- Bings Creek receives most of the waste in the regional district. This facility accepts many waste streams and the future function and capacity of this facility needs to be determined.
- Bings Creek does not receive ICI sector recyclables. Although residential recyclables are received at the transfer station, there is very little room to receive any more material. The transfer station building received both residential recycling and waste destined for disposal from residential and commercial sources.
- Bings Creek is not equipped with compactors or balers. Purchasing this equipment may lead to operational efficiencies.

The role of the Bings Creek Transfer Station needs to be determined. This should take into consideration the type and amount of material it would be receiving, any processing that could occur on site and a condition assessment of the structures. The CVRD plans to begin a transfer station operations analysis during the solid waste management planning process to determine the feasibility of capital and operational improvements.

3.3.2 Option 2: Create an Asset Management Plan

Issues:

- The CVRD owns a number of mobile (trucks/equipment) and stationary (buildings) assets. Mobile assets have varied life spans and stationary structures typically last longer than mobile assets.
- It is prudent to understand the assets that the CVRD holds and the operational and financial considerations to manage the solid waste system in a sustainable manner.

In 2016, the CVRD adopted an Asset Management Policy and is committed to applying recognized holistic Asset Management practices in its strategic planning, operations and financial management systems to deliver sustainable services to its communities and direct customers.

As part of the SWMP, an asset management planning process could be conducted to document the future needs of the solid waste management system, how those assets are operated and managed, lifespan of those assets, cost of assets and financial plan to pay for the assets (replacement or repair) and where the revenues would come from.

3.3.3 Option 3: Emergency Management Plan

Issues:

- The CVRD currently does not have an emergency/disaster management plan for solid waste in the event of a natural disaster.

Several Canadian municipalities, such as Fort McMurray, interior BC, and Calgary, were affected by fires or floods. These types of disasters create a chaotic situation and require a management plan to deal with the large amounts or different types of waste that will require disposal or staging. Consideration should be given to developing an Emergency Management Plan for public waste management facilities. The CVRD is susceptible to fires, floods and earthquakes.

3.4 Education and Behaviour Change Considerations

Increased education is not presented as a separate option in this document. Many of the options outlined herein would require CVRD residents to change their behaviour. To be successful, these options would require education programs to be expanded.

In addition to continuing to promote waste reduction and diversion programs through vivid print and electronic communications tools, social media (e.g., Facebook, Twitter, YouTube), and hands on technical assistance, other behaviour change tools can be integrated into education efforts. The behaviour change tactics outlined within community-based social marketing (CBSM) can provide a framework for how to most effectively target a specific behaviour. Derived from social marketing by Doug McKenzie-Mohr, an environmental psychologist, CBSM offers a several behaviour change tools that can be incorporated into existing and future education initiatives. Examples of CBSM behaviour based tools include:

- Commitment – By agreeing to a small request, people have subsequently been found to be far more likely to agree to a larger request.
- Prompts – Prompts can also be used to encourage people to engage in positive behaviour. By providing visual or auditory aids, people are reminded to perform a particular action. Prompts often take the form of a sticker or tag posted in close proximity to the action.
- Norms – Norms guide how we behave and are largely influenced by the behaviour of those around us. If members of our community, especially our immediate networks, are living sustainably, we are more likely to do the same.
- Social Diffusion – New behaviours are frequently adopted because friends, colleagues, or competitors have changed certain behaviours. To encourage social diffusion, make commitments to new behaviours public and visible (such as adding a sticker for another environmental behaviour to the side of a collection container) and/or recruit well known and respected opinion leaders in the community to promote a specific behaviour.
- Communication – The more relevant messages are to a group, the more likely it is to captivate someone's attention.
- Incentives/Disincentives – Closely pairing an incentive, or reward, to specific positive behaviour can have a substantial impact on encouraging sustainable activities. This strategy is particularly useful when motivation to engage in action is low or people are not doing the activity as effectively as they could.
- Convenience – Consider the external barriers related to a project, how they can be overcome, and what resources are needed to successfully address them.

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We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
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GEOENVIRONMENTAL

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