Solid Waste Management Plan Strategy Development Summary Report

PRESENTED TO

Capital Regional District

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Tetra Tech Canada Inc.
Suite 1000 – 10th Floor, 885 Dunsmuir Street
Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

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EXECUTIVE SUMMARY

Tetra Tech Canada (Tetra Tech) was retained by the Capital Regional District (CRD) to identify and evaluate potential waste management strategy options for Revision 3 of the Solid Waste Management Plan (SWMP).

The CRD's third SWMP Revision began in 2012. A Public and Technical Advisory Committee reviewed several reports, which included options to consider in the revised SWMP. However, this process was put on hold in 2015 to investigate integrated resource management opportunities. The SWMP Revision process was restarted with a new committee, the Solid Waste Advisory Committee (SWAC), in 2018.

The strategy development process took place from October 2018 to April 2019 and involved four SWAC meetings to develop strategies and gather their feedback. During this process, the SWAC was provided with three technical memoranda (tech memos) and presentations were made to the committee for discussion and input. The process built on the work developed by the CRD between 2012 and 2014 (during the initial stages of the SWMP Revision) and was updated to take into consideration new programs (such as organics collection) and recommendations in the solid waste management planning guide which was published by the British Columbia Ministry of Environment and Climate Change Strategy.

The strategy development was based on the following Guiding Principles, Objectives and Goals, which were developed by the SWAC in June 2018 and were endorsed by the CRD Board in October 2018.

Guiding Principles

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

Objectives

1. Improve participation in waste reduction activities and diversion services.
2. Decrease contamination levels in waste streams.
3. Facilitate processing and markets for organics, recyclables, and wood waste as appropriate.
4. Maximize local solid waste disposal capacity.
5. Establish a long-term sustainable financial model for the CRD's solid waste services.

Goals

1. To surpass the provincial per capita waste disposal targets.
2. To extend the life of Hartland Landfill to 2100 plus.
3. To have informed citizens that participate effectively in proper waste management practices.
4. To ensure that the CRD's solid waste services are financially sustainable.

Strategies

Tetra Tech, SWAC and CRD staff developed the following strategies for Revision 3 of the SWMP. Each strategy has embedded actions, which are further detailed in the summary report.

1. Continue and Enhance Education Programs.
2. Encourage Waste Prevention.
3. Support Reduction of Avoidable Food Waste.
4. Support Reuse Activities in the Region.
5. Support Local Governments in Working Towards Zero Waste and a Circular Economy.
6. Continue and Enhance Policy Development.
7. Increase Residential Diversion.
8. Increase Multi-Family Diversion.
9. Increase ICI Diversion.
10. Support Existing and New EPR Programs.
11. Increase Organics Diversion and Processing Capacity.
12. Increase Construction, Renovation and Demolition (CR&D) Material Diversion.
13. Encourage Proper Public Space Waste Management Activities.
14. Optimize Landfill Gas Management.
15. Enhance Hartland Disposal Capacity.

The focus of the strategy development and evaluation was on the first 13 strategies which address actions at the higher levels of the 5R pollution prevention hierarchy (Reduction, Reuse and Recycling). Recovery and Residual Management have not yet been discussed in detail as the CRD Board is currently reviewing landfill gas utilization options and a new master fill plan for Hartland landfill is in progress.

Evaluation

The strategies were assessed and scored according to evaluation criteria developed by the SWAC. As part of the evaluation process, SWAC also reviewed considerations for new funding to support strategies that were identified as having the greatest potential to increase diversion. The cost considerations will be discussed in more detail as part of the financial model development.

Table E-1: Evaluation Summary

#	Strategy	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Impact on Waste Disposal	Score	Cost Considerations
1	**Continue and Enhance Education Programs**	High	Med	Med	Med	14	▪ $100,000 annually to enhance education programs. ▪ Additional funding may be required for special campaigns, initiatives, and/or consultation (e.g. new bans).
2	**Encourage Waste Prevention**	Med	Med	Med	Low	10	▪ $50,000 annual grant allocation ▪ Minimal to moderate staff time for all years.

#	Strategy	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Impact on Waste Disposal	Score	Cost Considerations
3	**Support Reduction of Avoidable Food Waste**	High	Med	High	Med	16	▪ Minimal to moderate staff time for all years. ▪ Funding may be required to continue "*Love Food Hate Waste*" program (or similar initiative).
4	**Support Reuse Activities in the Region**	High	Med	Med	Med	14	▪ Minimal to moderate staff time for all years.
5	**Support Local Governments in Working Towards Zero Waste and a Circular Economy**	High	Med	High	Low	14	▪ Minimal to moderate staff time for all years.
6	**Continue and Enhance Policy Development**	High	Med	Low	Med	12	▪ May require significant funding if CRD pursues licensing or regulatory mechanisms, including funding for consultation.
7	**Increase Residential Diversion**	Med	Med	Med	Med	12	▪ $25,000 annually to support depot diversion efforts. Evaluate effectiveness after two years.
8	**Increase Multi-Family Diversion**	Med	Med	Med	Med	12	▪ $50,000 annually for education and to implement actions.
9	**Increase ICI Diversion**	High	High	Med	High	18	▪ $50,000 annually for education and to implement actions.
10	**Support Existing and New EPR Programs**	High	Med	Med	Med	14	▪ Funding may be required to educate the public if new disposal bans for EPR materials take effect at Hartland landfill.
11	**Increase Organics Diversion and Processing Capacity**	High	High	High	High	20	▪ Additional required costs will be determined through the RFEOI process. ▪ Funding may be required to educate about use of compostable products and packaging.
12	**Increase Construction, Renovation and Demolition (CR&D) Material Diversion**	High	High	Med	High	18	▪ $50,000 annually for two years. ▪ Additional funding may be required to investigate beneficial uses of CR&D waste and banning or surcharging mixed CR&D loads at the landfill.
13	**Enhance Public Space Waste Management**	High	Low	High	Low	12	▪ $20,000 for annual illegal dumping campaign for two years; evaluate effectiveness after two years.

Based on the strategies, Tetra Tech completed a diversion potential analysis of materials that could be diverted from waste disposal in the short, medium, and long-term. The resulting suggested disposal targets are presented in the table below.

Table E-2: Recommended Targets

	Short-Term Goal (3 years)	Medium-Term Goal (5 years)	Long-Term Aspirational Goal (10+ years)
Disposal Target (kg per capita)	**340**	**285**	**250**
Description of how target will be achieved	▪ Resulting diversion potential from CR&D programs and organics diversion from single family, multi-family, and ICI sector. ▪ Single family, multi-family, and ICI recycling and education programs will be implemented but may not improve diversion levels until medium term.	▪ Continue to improve single family, multi-family, and ICI recycling and education programs; these programs are expected to show diversion in medium term. ▪ CR&D sector programs and organic material diversion programs will be continued.	▪ All programs will be refined, resulting in increased diversion in all sectors. ▪ New EPR programs may be implemented in this timeline.

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
CRD	Capital Regional District
EMA	Environmental Management Act
Ministry	British Columbia Ministry of Environment and Climate Change Strategy
SWAC	Solid Waste Advisory Committee
SWMP	Solid Waste Management Plan
Tetra Tech	Tetra Tech Canada Inc

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Capital Regional District and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Capital Regional District, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Capital Regional District (CRD) to identify and evaluate potential waste management strategy options for Revision 3 of the Solid Waste Management Plan (SWMP). This summary report describes the process used for developing strategies for the SWMP Revision 3. This process took place from October 2018 to April 2019 and included four interactive solid waste advisory committee (SWAC) meetings to develop strategies and gather feedback. During this time, the SWAC was presented with three technical memoranda (tech memos), which are attached in Appendices A through C. This process built on the work developed by the CRD between 2012 and 2014 (during the initial stages of the SWMP Revision) and takes into consideration programs that have been implemented (such as organics diversion) since 2014 and recommendations in the solid waste management planning guide which was published by the British Columbia Ministry of Environment and Climate Change Strategy.

1.1 Solid Waste Management Planning

Regional Districts in British Columbia (BC) are required to prepare SWMPs. In 1989, the *Waste Management Act* [now the E*nvironmental Management Act* (EMA)] was amended to require all regional districts to prepare and submit solid waste management plans to the BC Ministry of Environment and Climate Change Strategy (Ministry) for approval. The purpose of the SWMP is to provide a framework and guiding document that will outline the region's solid waste management activities over the next 5 to 10 years. The SWMP should identify how solid waste is managed in the region while keeping in mind local circumstances, community goals, disposal capacity, environmental protection, community support, operational capacity and financial sustainability.

1.2 CRD SWMP Revision 3

The CRD's first SWMP was approved by the Ministry in 1989; it has since been updated in 1991 and 1995. Since 1995, eight amendments have been added to the plan. The third SWMP Revision began in 2012. A Public and Technical Advisory Committee reviewed several reports, which included options to include in the Revised SWMP. However, this process was put on hold in 2015 to investigate integrated resource management opportunities. The SWMP Revision process was restarted with a new committee, the Solid Waste Advisory Committee (SWAC), in 2018.

Tetra Tech was retained in the last quarter of 2018. The proposed process and timeline to review, evaluate and select options for Revision 3 of the SWMP is illustrated on Figure 1-1.

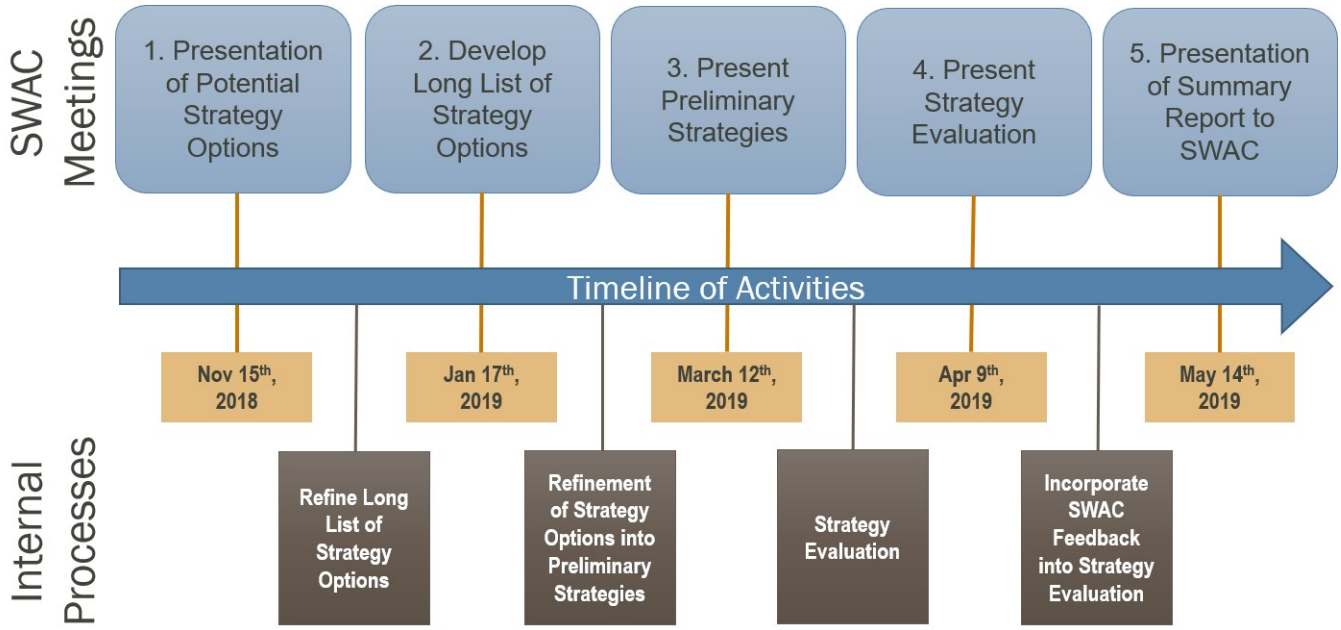


Figure 1-1: Timeline of SWMP Revision Process
(From Strategy Options to Strategies: Review, Evaluate and Select)

2.0 GUIDING PRINCIPLES, OBJECTIVES, AND GOALS

Guiding Principles, Objectives, and Goals were developed during the June 2018 SWAC meeting and were endorsed by the CRD Board in October 2018.

2.1 Guiding Principles

According to the Ministry's guidelines, the SWMP should be founded on locally-relevant guiding principles, which should be clearly stated in the plan. The Ministry identified eight guiding principles and indicated that clear rationale should be provided to the Ministry if these guiding principles are modified.

In the June 2018 SWAC meeting, guiding principles were discussed in detail. The Ministry's guiding principles were modified slightly to enhance clarity. The agreed upon guiding principles are listed below.

1. Promote zero waste approaches and influence others in support of a circular economy;
2. Promote the first 3 Rs (Reduce, Reuse and Recycle);
3. Maximize beneficial use of waste materials and manage residuals appropriately;
4. Support polluter-pay and user-pay approaches and manage incentives to maximize positive behaviour outcomes;
5. Prevent organics, recyclables and hazardous household waste from going into the garbage wherever practical;
6. Collaborate with other jurisdictions wherever practical;

7. Develop collaborative partnerships with interested parties both within and outside of the CRD to achieve regional targets set in plans; and

8. Level the playing field within regions for private and public solid waste management facilities.

2.2 Objectives

During the June 2018 SWAC meeting, draft key objectives were presented and discussed. The key objectives would be used as a planning tool to identify priorities and topics for discussion. The SWAC endorsed the following objectives for the plan:

1. Improve participation in waste reduction activities and diversion services.

2. Decrease contamination levels in waste streams.

3. Facilitate processing and markets for organics, recyclables, and wood waste as appropriate.

4. Maximize local solid waste disposal capacity.

5. Establish a long-term sustainable financial model for the CRD's solid waste service.

These objectives also informed the evaluation criteria used for strategy development.

2.3 Goals

In the June 2018 SWAC meeting, potential goals were presented and discussed. These can be considered goals for the SWMP and should be intended to create a long-term vision for the plan to achieve.

1. To surpass the provincial per capita waste disposal targets.

2. To extend the life of Hartland Landfill to the year 2100 plus.

3. To have informed citizens that participate effectively in proper waste management practices.

4. To ensure that the CRD's solid waste services are financially sustainable.

3.0 STRATEGIES

Strategies were developed through the following process:

1. A long list of strategy options was first presented to the SWAC at the January 17 SWAC meeting (Appendix A). Feedback was gathered on strategy options and their organization.

2. CRD staff and Tetra Tech staff worked to incorporate feedback gathered during and after the January 17 SWAC meeting to develop preliminary strategies (Appendix B), which were presented at the March 12 SWAC meeting. Feedback was gathered on preliminary strategies.

3. CRD staff and Tetra Tech staff worked to incorporate feedback gathered during and after the March 12 SWAC meeting to refine preliminary strategies (Appendix C). Refined strategies were then evaluated (further described in Section 4.0). Refined strategies and the evaluation were presented at the April 9 SWAC meeting. Further

feedback was provided by the SWAC on the refined strategies, and this feedback was incorporated. These resulting refined strategies are presented herein.

An overview of strategies is presented on Figure 3-1.

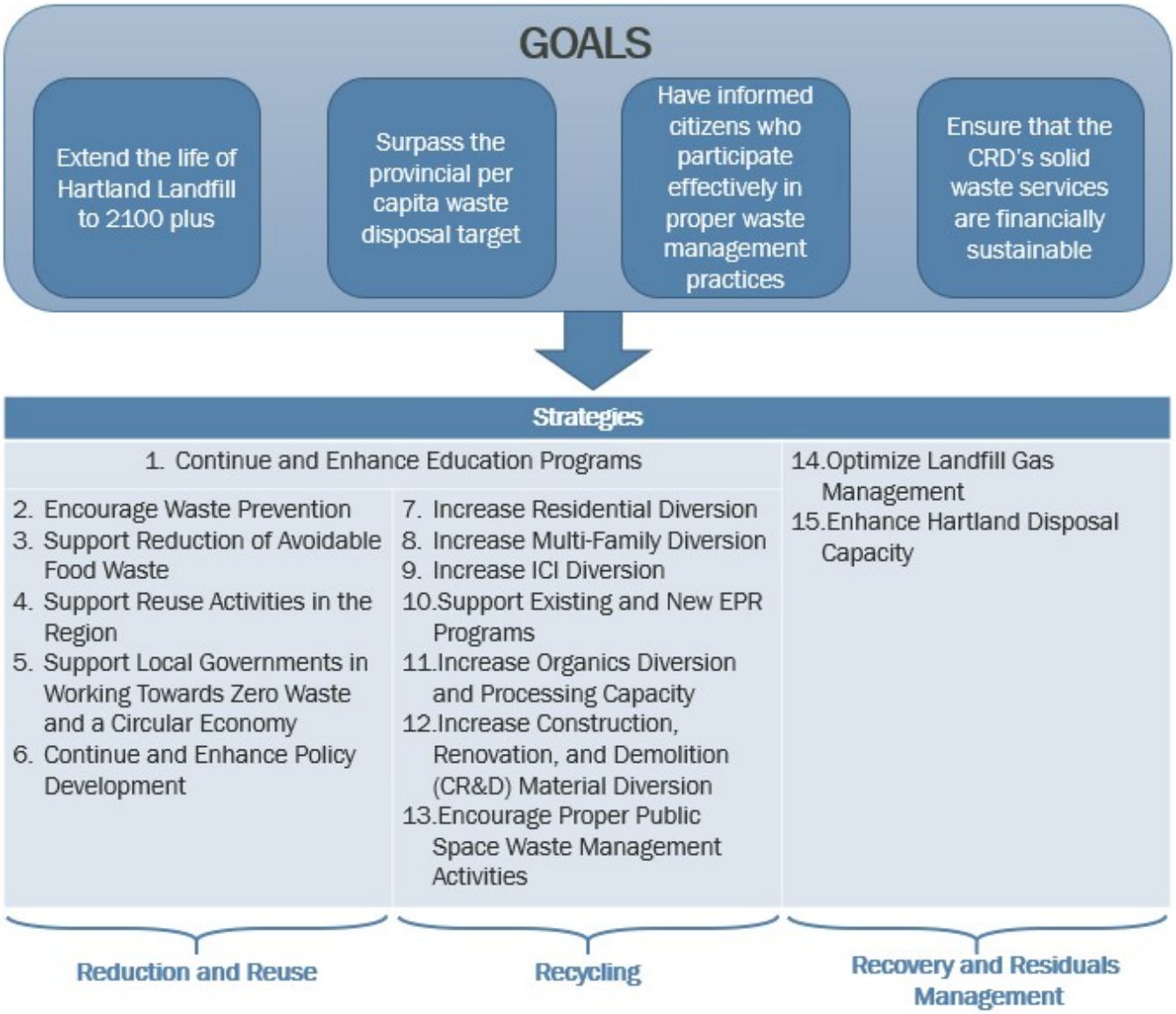


Figure 3-1: Strategy Overview

Note that **'Strategies'** are numbered and shown in bold, **'Actions'** are denoted by A, B, C, etc. and are not bolded.

Strategies are grouped by Reduction and Reuse (Section 3.1), Recycling (Section 3.2), and Recovery and Residuals Management (Section 3.3), as recommended in the Guide to Solid Waste Management Planning.

3.1 Reduction and Reuse

1. Continue and Enhance Education Programs.[1]

A. Ensure ongoing, up-to-date promotion and education resources to enable effective participation in CRD programs and initiatives.

B. Incorporate behaviour change components wherever possible (e.g., community-based social marketing); using a variety of education and communication strategies and tools, including digital marketing tools (e.g., social media).

C. Expand education programs to MF and ICI sector.

D. Enhance K-12 school program to include concepts of circular economy.

E. Collaborate with stakeholders on education campaigns, (e.g. local governments, product stewards).

F. Continue supporting environmental stewardship recognition.

G. Continue to engage residents on solid waste matters; using the appropriate level of consultation.

2. Encourage Waste Prevention

A. Promote less consumption and advocate for consumer responsibility.

B. Establish a community-based waste reduction grant program (could include food waste prevention projects).

C. Support single-use item reduction efforts.

D. Promote sustainable and/or packaging-free purchasing options.

E. Advocate provincially and federally to limit or eliminate the manufacturing, distribution or sale of single use items and non-recyclable materials.

F. Advocate provincially and federally for sustainable product design (e.g., standardized packaging that is reusable, recyclable, or compostable).

3. Support Reduction of Avoidable Food Waste

A. Support residential food waste reduction, for example, by continuing "*Love Food Hate Waste Canada*" program.

B. Support ICI food waste reduction, for example, by encouraging stores to donate edible food.

C. Continue to support food recovery organizations.

D. Advocate for regulation to clarify use-by versus Best Before dates and educate accordingly.

[1]Strategy 1, *Continue and Enhance Education Programs*, applies to Reduction, Reuse, and Recycling, as demonstrated on Figure 3-1, however, it has been placed under the Reduction and Reuse heading for report readability.

4. **Support Reuse Activities in the Region.**

    A. Continue to provide funding to non-profits to help offset garbage tipping fees for unusable donated items.

    B. Continue to support and promote donations to reuse establishments.

    C. Support reuse, renting and sharing programs, such as tool libraries, repair cafes, and sewing hubs, and other materials exchange activities.

    D. Investigate free store at Hartland landfill or other facilities.

5. **Support Local Governments in Working Towards Zero Waste and a Circular Economy.**

    A. Develop model language for bylaws, best practices, OCPs, and Economic Development strategies for use by local governments using research and collaboration to guide this process.

    B. Work with local governments to identify the need for solid waste facilities and zoning for waste management activities.

    C. Use policy tools to enable local recycling infrastructure.

    D. Investigate 'Pay-As-You-Throw' principles to use as tools to incent less waste disposal.

    E. Investigate use of clear bags for garbage or recyclables collection to encourage proper recycling of materials, where practicable and enforceable (e.g. at events).

6. **Continue and Enhance Policy Development.**

    A. Develop model procurement policies for use by local governments, non-profits, etc.

    B. Continue to expand material bans when viable alternatives exist.

    C. Investigate licensing waste management facilities in the region to encourage transparency, consistency, and a requirement that all facilities protect public health and the environment.

    D. Investigate regulatory mechanisms to manage municipal solid waste and recyclable materials in the region.

    E. Investigate options for debris from extreme weather such as community chipping days or special burning allowances in electoral areas.

3.2 Recycling

7. **Increase Residential Diversion.**

    A. Continue to promote diversion of recyclable materials (including organics), ensuring that education strives to minimize contamination in these streams.

    B. Collaborate with municipal and private sector service providers to support depot diversion efforts in the region for non-curbside materials.

    C. Encourage local processing and markets for recyclables.

    D. Develop tools, such as a guide, to support event recycling.

8. Increase Multi-Family Diversion.

A. Allocate resources to support MF recycling, for example, by developing standardized education materials.

B. Work with local governments and private sector service providers to develop waste source separation requirements.

C. Develop policy guide for recycling, composting and garbage space and access in multi-family developments.

D. Collaborate with stakeholders (e.g., private haulers who service MF buildings or MF property managers) to implement support for MF recycling, such as a 'Train-the-Trainer' Program.

9. Increase ICI Diversion.

A. Allocate resources to increase ICI diversion, for example, a business waste reduction liaison.

B. Advocate to expand the packaging and paper product EPR program to the ICI sector.

C. Create a business waste reduction toolkit, including education about how to apply Circular Economy principles.

D. Encourage municipalities to require waste management plans with business licenses.

E. Develop policy guide for ICI space and access requirements.

F. Work with local governments and private sector service providers to develop ICI waste source separation requirements.

G. Investigate shifting disposal ban enforcement to generator, rather than hauler.

10. Support Existing and New EPR Programs.

A. Advocate to the province to expand EPR programs.

Note: The Province is currently conducting an EPR gap analysis and considering adding new materials.

B. Collaborate with stewards to increase consumer awareness about EPR programs.

C. Advocate for increased return-to-retailer opportunities.

D. Advocate federally to standardize EPR programs across Canada.

11. Increase Organics Diversion and Processing Capacity.

A. Continue to promote organics waste diversion.

B. Investigate developing a resilient local organics processing infrastructure.

Note: The CRD Board has directed staff to issue a RFEOI for an in-region or near-region organics processing facility.

C. Support compost markets by purchasing back materials.

D. Collaborate with service providers and users (e.g., local businesses) to develop guidelines for use of compostable products and packaging.

12. Increase Construction, Renovation and Demolition (CR&D) Material Diversion.

A. Develop a comprehensive CR&D strategy, including characterization of materials, best practices, and pilot projects.

B. Develop and disseminate educational tools to support CR&D material diversion, e.g., create an industry toolkit, a deconstruction guide, and/or guidelines for diverting and utilizing reused materials.

C. Promote green building standards.

D. Continue collaboration with local governments to develop and use policy tools (e.g., construction permits, building codes) to maximize diversion and to align management plans.

E. Investigate beneficial uses of CR&D waste, including a clean wood waste ban.

F. Investigate banning or surcharging mixed CR&D loads at the landfill to encourage source separation.

G. Further develop programs for managing hazardous materials, like asbestos.

13. Encourage Proper Public Space Waste Management Activities.

A. Develop educational materials to prevent and reduce litter and abandoned materials in our neighbourhoods and public spaces.

B. Continue promoting alternatives to abandoned materials and illegal dumping by educating about proper management and disposal

C. Collaborate with stakeholders, including local governments and private sector facilities, to develop a regional approach to prevention of illegal dumping.

D. Investigate developing regionally-aligned bylaws.

E. Develop and pilot methodologies to ‘observe, record, and report’ on abandoned materials and illegal dumping incidents throughout the CRD.

F. Investigate options for large bulky item disposal, e.g., free drop-off days or large item pick-up days

3.3 Recovery & Residuals Management

14. Optimize Landfill Gas Management.

A. Continue to capture landfill gas for beneficial use.

Note: The CRD Board has directed staff to investigate landfill gas utilization options.

B. Investigate collaboration opportunities with educational institutions to research new beneficial uses and technologies.

15. **Enhance Hartland Disposal Capacity.**

    A. Review ban enforcement levels, subject to recycling market conditions.

    B. Continue to operate Hartland landfill using best practices.

    C. Develop design options to maximize disposal capacity until 2100 and beyond.

    Note: A new fill plan is in development. Design and aggregate management options could extend landfill life significantly.

    D. Continue to conduct research and investigate emerging technologies.

4.0 EVALUATION

The objectives of the Evaluation Process were:

1. **Gather SWAC feedback on the Preliminary Strategies and Associated Actions** (completed at March 12 SWAC meeting)**.**

2. **Assess the Strategies according to the Evaluation Criteria.** The evaluation criteria which have been used are:

    A. Technical Feasibility and Effectiveness;

    B. Environmental Impact and Benefits;

    C. Social Impact; and

    D. Effect on Waste Disposal.

3. **Determine high-level cost considerations and resource requirements for each strategy.**

4. **Identify how strategies would be implemented according to the CRD's resources over the next 10 years.**

5. **Create disposal targets.**

Notably, only strategies pertaining to Reduction, Reuse, and Recycling have been evaluated. Strategies pertaining to Recovery and Resource Management are currently on hold because of significant investigations into landfill gas usage and a new fill plan at Hartland Landfill.

Figure 4-1 outlines the evaluation process.

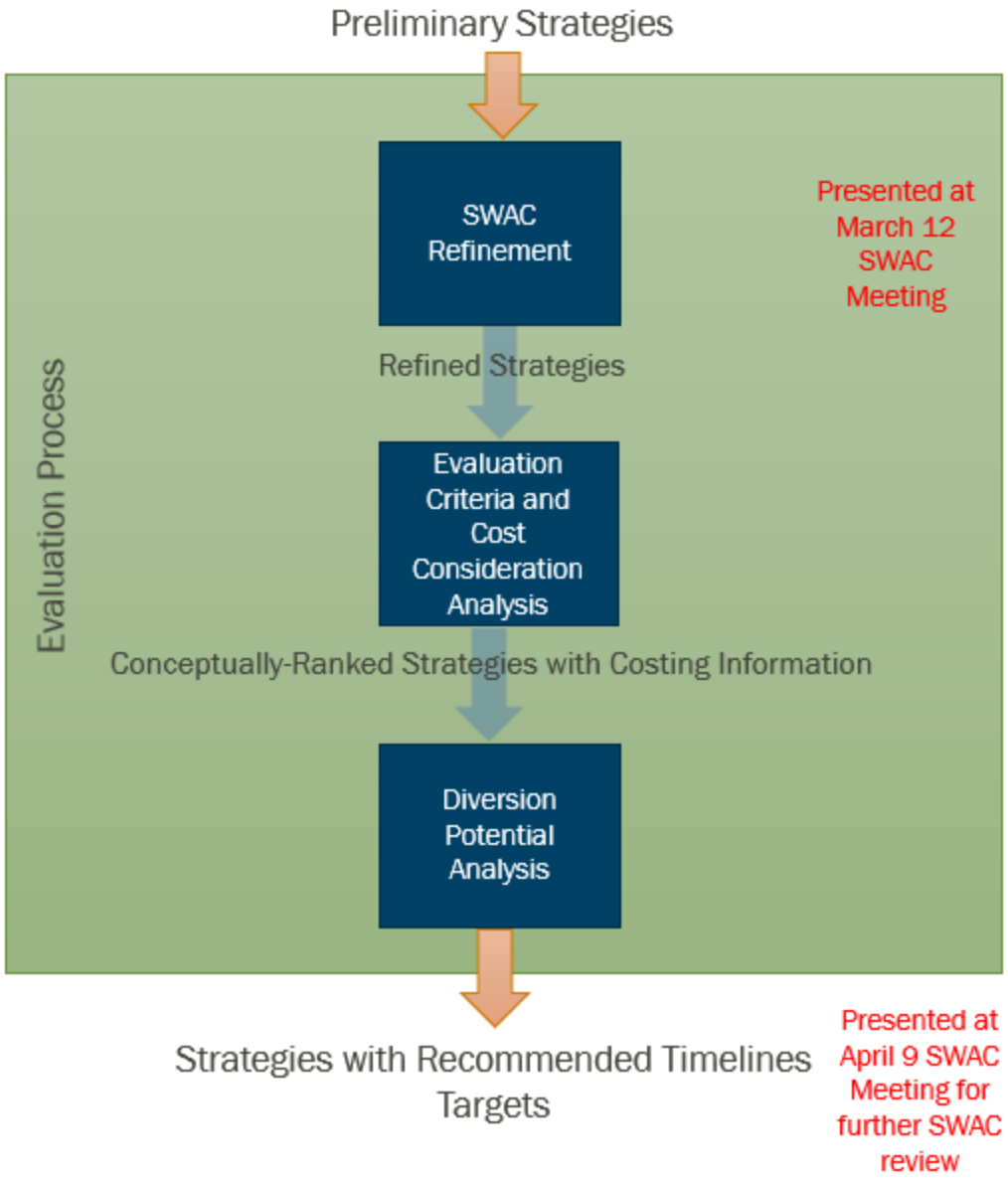


Figure 4-1: Evaluation Process Flow Diagram

The results of the Evaluation Process were presented at the April SWAC meeting. Further SWAC feedback was gathered at this meeting through:

1. Group discussions to focus on scoring process and cost considerations; and
2. A 'dotmocracy' exercise where SWAC could vote for options which should be prioritized.

The evaluation results presented herein have incorporated this feedback.

4.1 Evaluation Summary

This section provides a brief description and total score for each strategy, presented in Table 4-1. Notably, all strategies have scored higher than 10 (out of a possible 20 points). Cost considerations have been provided in the table.

Table 4-1: Evaluation Summary

Strategy #	Strategy	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Impact on Waste Disposal	Score	Summarized Evaluation	Cost Considerations
1	**Continue and Enhance Education Programs**	High	Medium	Medium	Medium	14	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ Though this strategy has low diversion potential, this strategy is a priority to ensure effective participation the CRD waste management system.	▪ $100,000 annually to enhance education programs. ▪ Additional funding may be required for special campaigns, initiatives, and/or consultation (e.g. new bans).
2	**Encourage Waste Prevention**	Medium	Medium	Medium	Low	10	▪ Implementation of this strategy will have considerable social impacts. ▪ This strategy is at the top of the pollution prevention hierarchy and may work to create culture and systems change that may ultimately reduce disposal in the CRD.	▪ $50,000 annual grant allocation ▪ Minimal to moderate staff time for all years.
3	**Support Reduction of Avoidable Food Waste**	High	Medium	High	Medium	16	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ This strategy would have medium environmental impact and benefits, since edible food currently makes up 12% of the material disposed at Hartland.	▪ Minimal to moderate staff time for all years. ▪ Funding may be required to continue Love Food Hate Waste program (or similar initiative).
4	**Support Reuse Activities in the Region**	High	Medium	Medium	Medium	14	▪ This strategy is expected to have only a small impact on disposal but may work to create culture and systems change that may ultimately reduce disposal in the CRD.	▪ Minimal to moderate staff time for all years.
5	**Support Local Governments in Working Towards Zero Waste and a Circular Economy**	High	Medium	High	Low	14	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ This strategy does not have a directly associated impact on disposal, however, they contribute to creating a culture and systems change that may ultimately reduce disposal in the CRD.	▪ Minimal to moderate staff time for all years.
6	**Continue and Enhance Policy Development**	High	Medium	Low	Medium	12	▪ Implementation of this strategy is feasible. ▪ The main environmental and disposal impact associated with this strategy is the potential for material disposal bans.	▪ May require significant funding if CRD pursues licensing or regulatory mechanisms, including funding for consultation.
7	**Increase Residential Diversion**	Medium	Medium	Medium	Medium	12	▪ Implementing this strategy and improving local recycling markets can enhance long-term stability and resiliency of recycling programs.	▪ $25,000 annually to support depot diversion efforts. Evaluate effectiveness after two years.
8	**Increase Multi-Family Diversion**	Medium	Medium	Medium	Medium	12	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ The multi-family sector contributes 13% to the total material disposed at Hartland; this strategy would likely have the potential for a moderate effect on the CRD disposal rate.	▪ $50,000 annually for education and to implement actions.
9	**Increase ICI Diversion**	High	High	Medium	High	18	▪ Implementation of this strategy is feasible. ▪ The ICI sector contributes 41% to the total material disposed at Hartland; this strategy has the potential for a considerable effect on the CRD disposal rate.	▪ $50,000 annually for education and to implement actions.
10	**Support Existing and New EPR Programs**	High	Medium	Medium	Medium	14	▪ Implementation of this strategy is feasible. ▪ If the province implements additional EPR programs this could reduce the CRD's disposal rate significantly.	▪ Funding may be required to educate the public if new disposal bans for EPR materials take effect at Hartland landfill.
11	**Increase Organics Diversion and Processing Capacity**	High	High	High	High	20	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ 27% of the material disposed at Hartland is organic materials; this strategy may have a modest impact on reducing the quantity of organic material disposed.	▪ Additional required costs will be determined through the RFEOI process. ▪ Funding may be required to educate about use of compostable products and packaging.
12	**Increase Construction, Renovation and Demolition (CR&D) Material Diversion**	High	High	Medium	High	18	▪ Implementation of this strategy is feasible. ▪ All actions in this strategy support the goal to decrease the CRD's overall disposal. If a disposal ban was implemented as a result of this strategy, this could have a significant impact on the CRD's disposal rate.	▪ $50,000 annually for two years. ▪ Additional funding may be required to investigate beneficial uses of CR&D waste and banning or surcharging mixed CR&D loads at the landfill.
13	**Enhance Public Space Waste Management**	High	Low	High	Low	12	▪ Implementation of this strategy is feasible. ▪ This strategy strives to reduce abandoned waste and illegal dumping, which are important social issues	▪ $20,000 for annual illegal dumping campaign for two years; evaluate effectiveness after two years.

5.0 POTENTIAL DIVERSION TARGETS

Based on the prioritization of strategies, Tetra Tech conducted a diversion potential analysis of materials that could be removed from the waste stream in the short, medium, and long-term. This diversion potential analysis is discussed in detail in Appendix C.

For the short-term, the focus for the CRD is proposed to be the CR&D sector and diversion of organic materials. Also, in the short-term, programs for single-family, multi-family, and ICI diversion will be implemented. Most of these are education programs, so they are expected to take several years before seeing results in diversion. **The resulting diversion potential in the short-term is expected to be mostly due to a reduced disposal of CR&D materials, and organic materials in the single-family, multi-family, and ICI sectors.**

In the medium-term, the focus will be on continuing and improving the single-family, multi-family, and ICI programs. These programs (which will begin implementation in the short-term) are expected to begin to show results by this timeframe. CR&D sector programs and organic materials diversion programs will be continued. **The improved diversion potential in the medium-term is expected to be mostly due to reduced tonnage of single-family, multi-family, and ICI sector recyclable materials. Diversion levels for organic materials are also expected to further improve in these sectors.**

In the long-term, all programs will be refined, resulting in increased diversion in all sectors. Additionally, new EPR programs may be implemented in this timeframe. **The improved diversion potential in the long-term is expected to be due to slight improvement in all sectors due to program refinement, and a reduced tonnage of printed paper and packaging programs from the ICI sector, and reduced tonnage of textiles from all sectors.**

The current (2018) annual disposal rate in the CRD is 380 kg/capita. The Ministry has set a Provincial target of 350 kg/capita by 2020. One of the CRD's SWMP goals is to surpass the Provincial target.

The diversion potential analysis is included in Appendix C. Based on the CRD's waste composition and potential diversion from new programs, the resulting suggested disposal targets are presented in Table 5-1.

Table 5-1: Recommended Targets

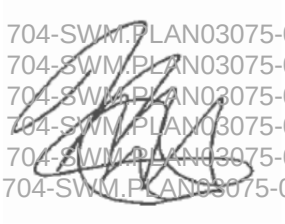
	Short-Term Goal (3 years)	Medium-Term Goal (5 years)	Long-Term Aspirational Goal (10+ years)
Targeted Sectors	▪ Construction, Renovation, and Demolition	▪ Single-family ▪ Multi-family ▪ ICI	▪ Refine programs to increase performance for all sectors
Disposal Target (kg per capita)	**340[1]**	**285**	**250[2]**

[1]This target is aggressive and assumes that disposal bans for CR&D materials would be implemented.
[2]This target is aggressive and assumes that new EPR programs will be implemented by the Ministry in the long-term timeframe.

6.0 CLOSURE

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

Respectfully Submitted,
Tetra Tech Canada Inc.



Prepared by:
Melissa Nielsen, E.I.T.
Project Engineer-in-Training
Solid Waste Management Practice
Direct Line: 604.608.8638
Melissa.Nielsen@tetratech.com

Reviewed by:
Wilbert Yang, P.Eng.
Senior Planning Engineer
Solid Waste Management Practice
Direct Line: 604.608.8648
Wilbert.Yang@tetratech.com

/tv/sy

APPENDIX A

TECH MEMO:
LONG LIST OF OPTIONS FOR THE SOLID WASTE MANAGEMENT PLAN

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Anke Bergner, Tom Watkins, Russ Smith	**Date:**	December 20, 2018
cc:		**Memo No.:**	001
From:	Wilbert Yang, Melissa Nielsen, Claudia Castro	**File:**	704-SWM.PLAN03075
Subject:	Long List of Options for the Solid Waste Management Plan V.2		

1.0 INTRODUCTION

Tetra Tech Canada (Tetra Tech) was retained by the Capital Regional District (CRD) to identify and evaluate potential waste management strategy options for Revision 3 of the Solid Waste Management Plan (SWMP). This Technical Memorandum (tech memo) discusses a long list of options to be considered in the SWMP. The CRD's Solid Waste Advisory Committee (SWAC) was presented the initial long list of potential options during a meeting on November 15, 2018. The long list of options builds on the work developed by the CRD between 2012 and 2014 (during the initial stages of the SWMP Revision) and further includes options which are relevant to the current state of the CRD waste management system.

1.1 Solid Waste Management Planning

Regional Districts in British Columbia (BC) are required to prepare SWMPs. In 1989, the *Waste Management Act* [now the E*nvironmental Management Act* (EMA)] was amended to require all regional districts to prepare and submit solid waste management plans to the BC Ministry of Environment and Climate Change Strategy (Ministry) for approval. The purpose of the SWMP is to provide a framework and guiding document that will indicate the region's solid waste management activities over the next 5 to 10 years. The SWMP should outline how solid waste is managed in the region while keeping in mind local circumstances, community goals, disposal capacity, environmental protection, community support, operational capacity and financial sustainability.

1.2 CRD SWMP Revision 3

The CRD's first SWMP was approved by the Ministry in 1989; it has since been updated in 1991 and 1995. Since 1995, eight amendments have been added to the plan. The third SWMP Revision began in 2012. A Public and Technical Advisory Committee reviewed several reports, which included options to include in the Revised SWMP. However, this process was put on hold in 2015 to investigate integrated resource management opportunities. The SWMP Revision process was restarted with a new committee, the Solid Waste Advisory Committee (SWAC), in 2018.

Tetra Tech was retained in the last quarter of 2018. The proposed process and timeline to review, evaluate and select options for Revision 3 of the SWMP is illustrated on Figure 1-1.

Tetra Tech Canada Inc.
Suite 1000 – 10th Floor, 885 Dunsmuir Street
Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

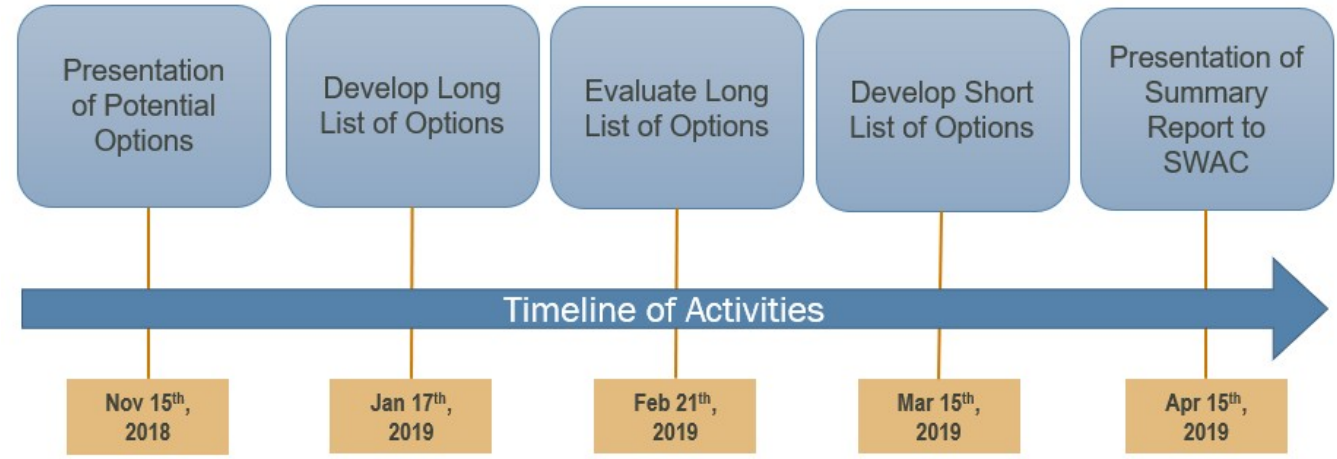


Figure 1-1: Timeline of SWMP Revision Process

The list of options in this tech memo forms a basis for discussion for the January 17, 2019 SWAC meeting. At this meeting, the SWAC will be asked to further elaborate and define the long list of options. Tetra Tech will then work with the CRD to develop evaluation criteria based on the SWMP's Guiding Principles, Objectives, and Goals (presented in sections 1.3, 1.4, and 1.5), which will be used to create a short list of options.

1.3 Guiding Principles

According to the Ministry's guidelines, the SWMP should be founded on locally-relevant guiding principles, which should be clearly stated in the plan. The Ministry provides eight guiding principles – if these guiding principles are modified, a clear rationale for these decisions should be provided to the Ministry.

In the June 2018 SWAC meeting, guiding principles were discussed in detail. The Ministry's guiding principles were modified slightly to enhance clarity. The guiding principles are:

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

1.4 Objectives

During the June 2018 SWAC meeting, draft key objectives were presented and discussed. The key objectives are to be used as a planning tool to identify priorities for topics for discussion. The SWAC proposed the following objectives for the plan:

1. Improve participation in waste reduction activities and diversion services.
2. Decrease contamination levels in waste streams.
3. Facilitate processing and markets for organics, recyclables, and wood waste as appropriate.
4. Maximize local solid waste disposal capacity.
5. Establish a long-term sustainable financial model for the CRD's solid waste service.

These objectives will be further discussed at the February 2019 SWAC meeting and will inform the evaluation criteria to move from the long list to the short list of options.

1.5 Goals

In the June 2018 SWAC meeting, draft key goals were presented and discussed. These can be considered goals for the SWMP and should be intended to create a long-term vision for the plan to achieve.

1. To surpass the provincial per capita waste disposal targets.
2. To extend the life of Hartland Landfill to the year 2100 plus.
3. To have informed citizens that participate effectively in proper waste management practices.
4. To ensure that the CRD's solid waste services are financially sustainable.

The Guiding Principles, Objectives and Goals were endorsed by the CRD Board in October 2018.

2.0 DIVERSION POTENTIAL

The waste diversion analysis, in this section, shows that there are opportunities to increase waste diversion in the regional district.

The Ministry set a provincial target of 350 kilograms (kg) per capita per year which should be achieved by 2020. The CRD is one of the top performing regional districts in the Province and met this target in 2015 and 2016. However, the 2017 disposal rate increased to 407 kg/capita which is suspected to be from strong real estate activity in the region. The most recent disposal rates for the CRD are presented in Table 2-1.

Table 2-1: CRD Per Capita Disposal Rates

Year	Per Capita Disposal (kg per capita)
2015	345
2016	353
2017	407

Two factors are considered when discussing diversion potential:

- **Material Grouping.**
- Table 2-2 presents how material types are grouped for the diversion potential analysis. These groupings reflect material categories that are managed in a particular way. For example, material that is collected via curbside recycling is grouped together, since these materials are targeted through improved residential recycling programs. Wasted food is separated from inedible organic materials, since wasted food may be targeted through waste reduction or food recovery programs, while inedible organic materials may be targeted through organics collection and processing 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;
  - Multi-Family;
  - Bins (i.e., self-hauled waste);
  - Industrial, Commercial, and Institutional (ICI); and
  - Construction and Demolition Materials (CR&D).

Table 2-2: Material Groupings

Category	Included Items
Curbside Recyclable Materials (EPR)	Packaging and Paper Products. This includes material that is collected from the residential sector (managed by Recycle BC) and material that is generated by the ICI sector (currently not managed as part of an EPR program).
Depot Recyclable Material (EPR)	Deposit and non-deposit Containers, Electronics, Batteries, and Used Oil, etc.
Wasted Food	Edible or donatable food
Inedible Organic Materials	Inedible food scraps, yard waste, and compostable paper
Clean Wood	Clean wood
Other Recyclable CR&D Materials	Cardboard, drywall, masonry (concrete/asphalt), metals
Textiles	All textiles
Bulky Objects	All bulky objects such as mattresses and furniture

Table 2-3 presents the potential waste diversion according to material categories and sector. The purpose of this is to highlight areas with room for improvement which could be targeted by options/programs outlined in the SWMP and the effect that waste reduction and diversion programs could have on the overall waste stream. Key findings from the diversion potential analysis include:

- 67% of the materials disposed could be potentially diverted;
- More waste is disposed by the ICI sector than by any other sector (41%);
- In residential and ICI sectors, the most diversion potential is from wasted food and organic materials; and
- If 95% of divertible materials were diverted, a 150 kg per capita disposal rate would be achieved (“Zero Waste”).

Table 2-3: Potential Waste Diversion[1]

Sector	Sector Contribution to Landfill (%)	Material Type	Material Contribution to Landfill (%)	Material Contribution to Landfill (tonnes)
Single-Family	25%	Curbside Recyclable Material	2.8%	4,390
		Depot Recyclable Material (EPR)	**3.2%**	5,110
		Wasted Food	**3.8%**	6,060
		Inedible Organic Materials	**4.9%**	7,740
		Clean Wood	0.1%	160
		Other Recyclable Building Materials	0.9%	1,480
		Textiles	1.8%	2,790
		Bulky Objects	0.0%	0
Total Possible Divertable from SF			**17.4%**	**27,730**
Multi-Family	13%	Curbside Recyclable Material	1.7%	2,700
		Depot Recyclable Material (EPR)	1.6%	2,490
		Wasted Food	2.0%	3,130
		Inedible Organic Materials	2.9%	4,560
		Clean Wood	0.0%	20
		Other Recyclable Building Materials	1.1%	1,760
		Textiles	0.6%	890
		Bulky Objects	0.0%	0
Total Possible Divertable from MF			**9.8%**	**15,550**
Bins	5%	Curbside Recyclable Material	0.1%	170
		Depot Recyclable Material (EPR)	0.4%	570
		Wasted Food	0.1%	110
		Inedible Organic Materials	0.4%	650
		Clean Wood	0.2%	370
		Other Recyclable Building Materials	0.9%	1,450
		Textiles	0.1%	160
		Bulky Objects	0.3%	410
Total Possible Divertable from Bins			**2.4%**	**3,890**
ICI	41%	Curbside Recyclable Material	**6.4%**	10,210
		Depot Recyclables	**5.8%**	9,290
		Wasted Food	**5.8%**	9,220
		Inedible Organic Materials	**7.2%**	11,450
		Clean Wood	0.2%	390
		Other Recyclable Building Materials	1.3%	2,090
		Textiles	2.6%	4,190
		Bulky Objects	0.8%	1,310
Total Possible Divertable from ICI			**30.2%**	**48,150**
CR&D	16%	Curbside Recyclable Material	0.1%	150
		Depot Recyclables	0.7%	1,170
		Wasted Food	0.0%	0
		Inedible Organic Materials	0.0%	50
		Clean Wood	2.2%	3,520
		Other Recyclable Building Materials	**3.6%**	5,670
		Textiles	0.2%	260
		Bulky Objects	0.1%	180
Total Possible Divertable from CR&D			**6.9%**	**11,000**

[1] Percentages shown in bold red text indicate that this material has a significant diversion potential (greater than 3%).

The diversion potential analysis is an useful tool that will help assess the environmental implications as the SWAC determines which long list options should be further considered for the short list options. During this process, disposal targets will be further discussed. Examples of potential disposal targets are presented in Table 2-4.

Table 2-4: Potential Disposal Targets

Description of Potential Target	Disposal Target (kg per capita)	% Divertible Materials Removed from Waste Stream to achieve goal
Current Disposal Rate	*407*	*N/A*
BC Ministry Goal	350	21%
Ambitious Goal	250	58%
Zero Waste Goal	150	95%

3.0 PRELIMINARY LONG LIST OF OPTIONS

This section presents the preliminary long list of options. These options were developed based on the following:

- Previous work completed in the 2012-2014 SWMP Revision, before the process was put on hold;
- Current trends in solid waste management (local, national, and global), as identified by Tetra Tech, the CRD, and the SWAC;
- Preliminary needs assessment of the CRD waste management system identified by CRD staff; and
- Initial brainstorming session with the SWAC and CRD staff on November 15, 2018 (options identified or strongly supported by the SWAC on November 15, 2018 are italicized and denoted by a "SWAC Item" bullet point in this section). Notes from the November 15 SWAC meeting are attached to this tech memo as Appendix A.

The options presented in this section are organized according to the pollution prevention hierarchy and the Circular Economy principles, as is further described in Table 3-1. At the January 17 SWAC Meeting, these options will be discussed and grouped as Strategies with multiple Action Items in each Strategy.

Figure 3-1: Pollution Prevention Hierarchy[2]

[2] 5 R Pollution Prevention Hierarchy – A Guide to Solid Waste Management Planning, BC Ministry of Environment and Climate Change

Table 3-1: Options Organization

Option Topic	Includes	Description
Circular Economy	▪ Education and Behaviour Change ▪ Advocacy ▪ Policy Development	Circular Economy represents approaches which apply to the waste management system as a whole (rather than as one of the levels of the pollution prevention hierarchy in Figure 3-1). Circular Economy is further defined and described in Section 3.1
Reduce & Reuse	▪ Reduce; and ▪ Reuse.	Reduce, Reuse, Recycle, Recover, and Residuals Management are the 5 Rs of the pollution prevention hierarchy (below). It is preferable to find solutions at the top levels of the pollution prevention hierarchy before using solutions lower in the pollution prevention hierarchy in Figure 3-1.
Recycle	▪ Recycle – Increasing Overall Diversion; ▪ Recycle – PPP; ▪ Recycle – EPR; and ▪ Recycle – Organics.	
Recovery and Residuals Management	▪ Recover ▪ Residuals Management ▪ Construction, Renovation and Demolition ▪ Illegal Dumping	

3.1 Circular Economy

As a regional district government, the CRD is well-positioned to be a Circular Economy leader. Within a Circular Economy, materials are extracted from the typical linear economy process line with the intention of delaying or avoiding disposal.

'Circular Economy' is *not* just a new word for recycling, rather, it's a replacement of conventional commercial incentives (i.e., single bottom line) with more sustainable alternatives (e.g., triple bottom line) to ensure that materials stay in use, instead of being disposed. This realignment of incentives should include legislation.

The re-creation of an economy (from linear to circular) must occur at all levels of government; the CRD cannot act alone in this endeavor. Thus, the CRD's strategy to move towards a Circular Economy could involve the following key components, which are described in the following sub-sections:

- **Education and Behaviour Change.** Education and behaviour change components are woven throughout many of the options in this document. Further, it is understood that any option which requires any behaviour change of the public must include education strategies. Broader education and behaviour change options are outlined in Section 3.1.1;
- **Advocacy.** Recognizing that the CRD cannot act alone in moving towards a Circular Economy, this section includes options for advocacy, wherein the CRD asks senior levels of government (provincial and federal) to consider legislation which could re-align conventional economic incentives; and
- **Policy Development** A variety of regulatory approaches may be taken, including enhancement of existing disposal bans, support for CRD municipalities to adopt Circular Economy practices, waste stream management licensing, and land use planning.

As the CRD moves towards a Circular Economy, there is an understanding that changes may be required to the larger system. Thus, while the options in Sections 3.2 and 3.4 each apply to a level of the pollution prevention hierarchy (Figure 3-1), the options in this section apply to the whole system.

Governments play a key role in the creation of a circular economy. As the public becomes more aware of pressing environmental issues, the support for change (especially pertaining to a visible problem like waste) should grow. In the SWMP Revision, the CRD can build on the following challenges and opportunities:

- Ideal placement as a local government of a progressive, environmentally-conscious region;
- Strong community organizations with environmental and social objectives that may be interested in participating in Circular Economy initiatives;
- Ideal placement in time where 'Circular Economy' is becoming more recognized; and
- Opportunities exist to promote sustainable design and enhance education efforts.

3.1.1 Education and Behaviour Change

Education and behaviour change components are woven throughout many of the options in this document. Further, it is understood that any option which requires any behaviour change of the public must include education strategies. Broader education and behaviour change options are outlined in this section. The goal is to promote zero waste approaches, influence others in support of a circular economy and have informed citizens who participate effectively in proper waste management practices.

3.1.1.1 Challenges and Opportunities

The challenges and opportunities relating to education and behaviour change in the CRD can be summarized as follows:

- Promotion and education is required to change behaviour and the CRD has a robust communications strategy;
- The CRD has a K-12 school outreach program which engages thousands of students each year; and
- Community-based social marketing (CBSM) is a proven approach to changing behaviour.

3.1.1.2 Options

Education and behavior change options in the CRD may include:

1. Ensure adequate CRD promotion and education resources;
2. Maintain and enhance robust communication strategy, including:
   - Web-based info, including a searchable database;
   - CRD InfoLine;
   - Brochures/print-based info;
   - Social media;
   - TV and radio campaign;

- Newspaper advertising;
- Community outreach; and
- Leveraging community associations to promote messaging.

SWAC Items

3. *Revise the K-12 school outreach curriculum to teach principles of circular economy*
4. *Create a toolkit for businesses and organizations to educate on how they can work in line with the Circular Economy.*

3.1.2 Advocacy

The CRD, as a federation of local governments, has limited power to influence producers and consumers. Thus, leadership among its group of local governments and advocacy to other levels of government is required to move towards a Circular Economy.

3.1.2.1 Challenges and Opportunities

The challenges and opportunities relating to advocacy in the CRD can be summarized as follows:

- BC has a well-established EPR programs that mandates the management of materials by producers, however, there are notable gaps in the current programs (e.g., no EPR programs for commercial sector (ICI) Packaging and Printed Paper).
- Limited power exists at regional district level to influence producers and consumers.

3.1.2.2 Options

Options relating to advocacy may include:

1. Advocate to the BC Ministry for the expansion of EPR programs.
2. Advocate provincially and federally to limit the distribution/sale of single-use items.
3. Advocate provincially and federally for sustainable product design, including:
   - Increase post-consumer recyclable content in consumer goods;
   - *Eliminate distribution and manufacturing of non-recyclable materials (packaging and other); and*
   - Encourage design for environmental principles and sustainable manufacturing.

SWAC Item

3.1.3 Policy Development

This section describes policy development to move the CRD in line with the Circular Economy include using disposal bans, waste stream management licensing, and land use planning tactics.

3.1.3.1 Challenges and Opportunities

The challenges and opportunities relating to policy development in the Capital Region can be summarized as follows:

- The CRD has had disposal bans in place for many recyclable items since 1991, introduced disposal bans on leaf and yard waste in 2006, and food scraps in 2015;
- CRD municipalities may have an appetite for implementing regulatory measures to limit use of single-use items, as demonstrated by the City of Victoria's Checkout Bag Regulation Bylaw;
- There is an opportunity to identify the role(s) of waste management facilities (existing and future) to support:
  - Regional economic development;
  - Local processing capacity; and
  - A Circular Economy.
- There is a lack of adequate zoning for waste management facilities in municipalities and electoral areas, which may lead to difficulty in siting future facilities, thus further limiting regional processing capacity and options;
- The CRD has a responsibility to protect public health and interests and the environment;
- A Guiding Principle of the CRD SWMP Revision 3 (as discussed in Section 1.3) is to level the playing field within the region for private and public solid waste management facilities. That is, solid waste management facilities in a given region, whether public or private, should be subject to similar requirements. CRD examples are the Salt Spring Island Transfer Station Bylaw and the Composting Facilities Bylaw; and
- There are opportunities for collaborating with other jurisdictions (e.g. ban the same materials) and developing partnerships (e.g. working with stewardship agencies).

3.1.3.2 Options

1. Expand material disposal bans to include more materials; consider enhancing or changing enforcement measures.
2. *Consider CRD legislation that can incentivize local use of materials which can be reused (e.g., incent consumers to use wood instead of drywall).* SWAC Item
3. Review CRD bylaws.
4. Support CRD municipalities in creating legislation to support circular economies at the municipal level:
   - Create sample policies and bylaws; and
   - Create toolkit for municipalities.
5. Increase zoning for waste management activities.
6. Develop language templates for Official Community Plans related to waste management activities
7. Include the potential role of waste management facilities in Economic Development Strategies and /or long-term plans.
8. Integrate consideration of waste management facility needs into long range planning such as Community Plans.
9. *License waste management facilities in the region and monitor their activities.* SWAC Item
10. Implement a waste collection franchising system in the region.
11. Promote procurement policies that support a circular economy.

3.2 REDUCE AND REUSE

The options in this section relate to reduce and reuse: the top two Rs of the pollution prevention hierarchy (Figure 3-1).

3.2.1 Reduce

The CRD undertakes a wide range of education activities to encourage reduction, including the school program and campaigns (such as the Create Memories not Garbage campaign). One of the biggest barriers to reducing are high material consumption levels which are a widespread issue, exacerbated by the recent economic and real estate upswing, resulting in an increased waste disposal rate in 2017.

As in many larger population centres, there is a growing acceptance of the 'sharing economy' and other local reuse solutions, including car- and bike-share programs, Repair Cafes, and the Victoria Tool Library.

It is important to consider food waste when discussing reduction, as edible food typically represents a large portion of landfilled material. Additionally, a large quantity of edible food waste is recycled through food scraps recycling programs – it is more desirable to address this problem at the top level of the waste prevention hierarchy and reduce, rather than recycle, wasted food. The CRD has recently joined Canada's "Love Food Hate Waste" campaign in an effort to decrease the amount of avoidable food waste from residential sources.

3.2.1.1 Challenges and Opportunities

The challenges and opportunities relating to 'Reduce' in the CRD can be summarized as follows:

- High material consumption levels;
- Large quantities of edible food are wasted in the CRD (18,000 tonnes of edible food waste were disposed at Hartland in 2017, or 12% of all landfilled materials);
- A growing interest exists to move towards circular economy solutions; and
- Local initiatives in place to reduce single-use items (e.g., City of Victoria Checkout Bag Regulation Bylaw).

3.2.1.2 Options

Reduce options may include:

1. Promote reduction of resources and goods use:
   - Continue to participate in "Love Food Hate Waste" program;
   - Promote better planning and buying habits; and
   - Promote a reduction in the purchasing of goods.
2. Support renting and sharing programs:
   - Support Tool Library, Repair Cafés, and DIY Repair; and
   - Support Sharing Economy Initiatives.
3. Support residential food waste reduction:

- Continue to participate in “Love Food Hate Waste” program;
- *Advocate for regulation for clarity around use-by vs expiry dates; and*
- *Educate CRD consumers about use-by vs expiry dates.*

SWAC Items

4. Support ICI food waste reduction.
5. Support single-use item reduction.

SWAC Items

- *Promote and provide support for retailers that provide packaging-free grocery options (bulk, BYO container, etc.); and*
- *Support similar programs to the City of Victoria’s Checkout Bag Regulation Bylaw to reduce single-use plastics. Consider supporting programs which apply to other single-use items, including those made of non-plastic materials.*

3.2.2 Reuse

Local reuse organizations exist in the CRD. However, large quantities of reusable goods are going into the landfill – in 2017, 8,000 tonnes of textiles were disposed at Hartland and 6,000 tonnes of durable plastic goods (e.g., toys) was disposed at Hartland; much of this material was still in a usable condition.

Additionally, large quantities of edible food are disposed by the ICI sector (e.g., grocery stores) – much of this food could have been donated. This is termed ‘food rescue’ and typically fits into the ‘reuse’ category of the waste prevention hierarchy.

The CRD recognizes the value of reuse. There is a reuse area at Hartland landfill and free stores at the Gulf Islands recycling depots. The CRD also allows non-profit reuse organizations to dispose of non-saleable goods at a reduced tipping fee at Hartland landfill.

3.2.2.1 Challenges and Opportunities

The challenges and opportunities relating to ‘Reuse’ in the CRD can be summarized as follows:

- Reusable goods are going into the landfill (furniture, textiles, building supplies, appliances, toys, etc.);
- Reuse Store platforms exist in the CRD, including stores for used goods (e.g. Thrift stores, ReStores) and online platforms (e.g. craigslist.org, usedvictoria.ca); and
- Food recovery organizations (e.g., food banks) exist in the CRD.

3.2.2.2 Options

Options relating to ‘reuse’ may include:

1. Support food recovery organizations (food banks, organizations that promote food reuse).
2. Support and maintain existing reuse activities by the CRD.
3. Support organizations and events that support reuse:
   - Continue to support Reuse Non-Profit Organizations

- Promote events such as community-wide garage sales, “reuse rendezvous”, “ski swap,” etc.; and
- *Promote and provide support for retailers that have in-house recovery programs (e.g., takeback programs).*

SWAC Item

4. Promote Reuse:
   - Continue to promote reuse establishments, such as Free Stores, ReStores, and Thrift Stores;
   - Promote Repair café/tool library; and
   - Consider an art contest and display using reused/salvaged materials.

3.3 RECYCLE

The options in this section relate to recycle, the third R of the pollution prevention hierarchy (Figure 3-1).

3.3.1 Recycle – Increasing Overall Diversion

Sections 3.3.2 through 3.3.4 discuss how the CRD could consider improving recycling of PPP, EPR items, and organics. However, there are some general, systematic changes which may be considered to increase overall diversion. Most of these changes involve modifying the garbage collection practices in the region. In the CRD, six municipalities in the CRD provide municipal garbage collection to residents, in the remaining municipalities and electoral areas, residents arrange for garbage collection from private haulers. Thus, it should be considered that any widespread changes to garbage collection may be very difficult to implement.

3.3.1.1 Challenges and Opportunities

The challenges and opportunities relating to ‘Recycle – Increasing Overall Diversion’ in the CRD can be summarized as follows:

- Recyclable materials are being landfilled;
- The CRD has disposal bans on many recyclable materials; and
- The Chinese National Sword policy is restricting markets for recyclables.

3.3.1.2 Options

SWAC Items

1. *Shift disposal ban enforcement efforts to generator, rather than hauler, with a focus on ICI sector.*
2. *Recommend that municipalities update bylaws to require use of clear bags for garbage.*
3. *Mandate collector to provide bags for organics collection.*
4. *Incentivize recycling through PAYT garbage collection. (Note: CRD already has user pay garbage collection system)*
5. *Recommend that municipalities update bylaws to require bi-weekly garbage collection to incentivize recycling (especially organics). (Note: CRD already has user pay garbage collection)*
6. *Set intention for government to initiate local recycling infrastructure.*

7. Promote Recycling:
   - Update MyRecyclopedia.ca– for mobile and web browsers;
   - *Enhance visibility of MyRecyclopedia.ca;* (SWAC Item)
   - Continue to support Victoria Compost Education Centre;
   - Continue to support Hartland Landfill Learning Centre and tours;
   - Continue to promote grasscycling and xeriscaping; and
   - Promote recycling at festivals and events.

3.3.2 Recycle – Packaging and Paper Products (PPP)

In 2014, the BC Recycling Regulation was amended to include Packaging and Paper Products (PPP) as an Extended Producer Responsibility (EPR) program. The amendment shifted the responsibility for managing these materials to producers who formed a nonprofit agency called Recycle BC to oversee the program. The CRD has a mature recycling program for single-family residences and has been providing curbside recycling in the region since 1989. Since 2014, the CRD has had an agreement with Recycle BC to contract the collection of PPP on their behalf. A three-stream recycling system is used.

Recycle BC is also responsible for PPP from the multi-family sector and offers financial incentives to pick up the material. In the Capital Region, the multi-family sector is served by private collectors. Only a few contractors have signed on to the Recycle BC program, and the majority of multi-family buildings receive recycling services from haulers who do not have contracted to Recycle BC.

The provincial PPP recycling program (Recycle BC) applies only to the residential sector, thus, private haulers collect from the ICI sector with varying levels of service. The CRD uses disposal bans to incent the ICI sector to recycle – haulers are fined if they arrive at the landfill with loads that contain recyclable materials.

3.3.2.1 Challenges and Opportunities

The challenges and opportunities relating to recycling of PPP in the CRD can be summarized as follows:

- *There is a lack of consistency of recycling service levels in multi-family buildings;* (SWAC Item)
- There is a lack of consistent recycling in the ICI sector;
- *There may be insufficient support for recycling in some areas, for example, private depots, multi-family residences, and ICI sector;* (SWAC Item)
- Recycle BC's funding does not cover the full costs of the Gulf Islands recycling depots; and
- The National Sword (China) policy is restricting markets for recyclables. This is a challenge but may encourage local processing capacity and markets.

3.3.2.2 Options

Options relating to recycling of PPP in the CRD may include:

1. Expand education programs for multi-family and ICI sector.

2. Implement ICI and multi-family source separation requirements.
3. Support ICI and multi-family recycling:
   - Design guidelines for multi-family waste management areas; and
   - Monitor and track recycling activities.
4. Review enforcement levels for material disposal bans, subject to recycling market conditions
5. Review funding options for Gulf Island recycling depots.
6. Encourage local markets for recyclables to address National Sword Issue.

3.3.3 Recycle – Extended Producer Responsibility (EPR)

BC uses EPR as a regulatory tool that aims to shift the responsibility for end-of-life management of products to the producer and creates an incentive for producers to consider environmental concerns when designing products. The range of products managed by EPR programs has expanded in the last decade, and the Ministry has recently announced its intention to include more items in EPR programs (e.g., textiles, mattresses).

Recycle BC is the EPR steward that manages PPP in BC. PPP challenges, opportunities, and options were discussed in Section 3.3.2. This section focuses on challenges, opportunities, and options for other EPR materials, which are typically collected at depots.

3.3.3.1 Challenges and Opportunities

The challenges and opportunities relating to recycling of EPR materials in the CRD can be summarized as follows:

- Different materials are collected by different stewards who often collect their items in different locations. Thus, multiple drop-off locations can lead to consumer confusion and frustration;
- Siting of depots can involve multiple jurisdictions and can be resisted at the community level;
- PPP in the ICI sector is not in an EPR program; and
- Some household hazardous waste (HHW) (e.g., glue, unlabeled materials) are not currently part of an EPR program. These materials are currently accepted for drop-off at Hartland and are costly to handle.

3.3.3.2 Options

Options relating to recycling of EPR material may include:

1. Advocate to the Ministry for expansion of EPR programs, including:
   - PPP for ICI sector;
   - Additional household hazardous materials (e.g., glues, cleaning products);
   - Bulky items (furniture and mattresses); and
   - Asphalt shingles.

SWAC Item

2. *Increase consumer awareness about EPR programs and use behavior change strategies to incentivize them to use EPR programs:*
   - Maintain database of drop-off locations for EPR (and other) materials at myrecyclopedia.ca; and

SWAC Item

   - *Improve instructions for consumers on how to use EPR programs*.
3. Maintain landfill bans on EPR-managed materials and update disposal ban list as new EPR programs are launched.

3.3.4 Recycle – Organics

The CRD has been diverting organics from Hartland landfill by using landfill disposal bans: yard and garden material have been banned since 2006 and kitchen scraps have been banned since January 2015. The CRD also supports the Victoria Compost Education Centre as backyard composting is an effective method to divert waste from the landfill.

3.3.4.1 Challenges and Opportunities

The challenges and opportunities relating to 'Recycle – Organics' in the CRD can be summarized as follows:

- Currently, there is no in-region composting facility (a procurement process to determine interest levels has been initiated);

SWAC Item

- *There are limited options for food scraps collection for multi-family and ICI sector buildings; most efforts to reduce organics disposal have been focused on the SF sector;*
- Kitchen scraps and leaf and yard waste collection services vary widely between municipalities; and

SWAC Item

- *There is confusion over what materials are accepted in food scraps collection systems, which has been exacerbated by greenwashing efforts which confuse biodegradable vs. compostable plastics.*

3.3.4.2 Options

Options relating to 'Recycle – Organics' may include:

1. Continue to search for an in-region or near-region processing facility for kitchen scraps (RFEOI issued):

SWAC Item

   - *Consider a CRD-owned or -operated facility, possibly on Hartland Landfill.*
2. Investigate opportunities to standardize organics diversion and collection services for:
   - Kitchen scraps, and/or;
   - Leaf and yard waste.

3.4 RECOVERY AND RESIDUALS MANAGEMENT

The options in this section relate to recovery and residuals management: the bottom two Rs of the pollution prevention hierarchy (Figure 3-1).

This section also includes all options relating to construction, renovation, and demolition (CR&D) waste. These options include those relating to all five Rs in the pollution prevention hierarchy.

3.4.1 Recovery

Recover, the fourth level of the pollution prevention hierarchy, is the recovery of material and/or energy from the waste stream by applying technology. Currently, the CRD recovers landfill gas (LFG) from Hartland, which is used to make electricity.

3.4.1.1 Challenges and Opportunities

The challenges and opportunities relating to recovery in the CRD can be summarized as follows:

- Hartland landfill gas utilization could be maximized; and
- Markets may exist for clean wood waste for fuel.

3.4.1.2 Options

Options relating to recovery in the CRD may include:

1. Continue to work towards provincially mandated LFG capture rate at Hartland.
2. Explore and implement best options for use of landfill gas; options may include:
   - Use as electricity;
   - Inject upgraded renewable natural gas (RNG) into Fortis grid;
   - Use RNG to power collection vehicles; and
   - Use RNG to power CRD facilities.
3. Explore markets for clean wood waste.
4. Continue to monitor new technologies.

3.4.2 Residuals Management

Any material which is not reused, recycled, or recovered must ultimately be disposed. In the CRD, this material is currently disposed at Hartland Landfill which is the only municipal solid waste facility in the region. The Highwest Landfill is also located in the region and included in the CRD's SWMP. It is licensed to accept up to 22,500 tonnes for non-putrescible waste per year.

3.4.2.1 Challenges and Opportunities

The challenges and opportunities relating to residuals management in the CRD can be summarized as follows:

- It is desirable to maximize airspace at Hartland landfill to extend its life beyond 2100; and
- There is currently limited lifespan for CR&D disposal at Highwest Landfill, after which it is expected that an increased quantity of CR&D material will be directed to Hartland Landfill.

3.4.2.2 Options

Options relating to residuals management may include:

1. Continue to operate Hartland landfill according to the fill plan and best practices.
2. Encourage waste diversion to maximize landfill life.
3. Explore design options to maximize disposal capacity until 2100 and beyond.
4. *Increase monitoring at historic dump sites.*
5. *Re-mine and process residuals for additional recovery.*

SWAC Items

3.4.3 Construction, Renovation and Demolition (CR&D) Materials

This section addresses Construction, Renovation and Demolition waste (CR&D). This is the second largest component of the CRD's waste stream. These options relate to all Rs of the pollution prevention hierarchy as they relate to CR&D waste.

3.4.3.1 Challenges and Opportunities

The challenges and opportunities relating to 'Construction, Renovation and Demolition in the CRD can be summarized as follows:

- Per-capita disposal rates increased in 2017; this is assumed to be mostly due to CR&D activity;
- *Building and demolition permits vary between CRD municipalities and most do not require any deconstruction;*
- Markets may exist for some clean wood waste for fuel;
- Recyclable building materials are being landfilled;
- Asbestos-containing materials require special handling and management protocols making it expensive to manage properly; and
- Highwest Landfill (which accepts CR&D materials) is expected to close by 2023.

SWAC Item

3.4.3.2 Options

Options relating to Construction, Renovation and Demolition may include:

1. Investigate and quantify CR&D waste management practices in the region.
2. Explore markets for materials, including:
   - Clean wood waste;
   - Urban wood waste (i.e., painted and treated wood);
   - Asphalt shingles;
   - Concrete and asphalt;
   - Plastics and cardboard;
   - Metals;
   - Carpet underlay; and
   - Reusable materials.
3. Explore regional processing capacity for CR&D recycling:
   - Investigate new recycling processors for additional CR&D materials;
   - Establish one or more centralized processing facilities; and

- Authorize reuse/recycling/resource recover facilities.

4. Support reduction of CR&D waste:
   - Support re-purposing of buildings (i.e., not demolishing buildings, moving buildings).
5. Support deconstruction:
   - Educate and inform residents and contractors;
   - Vary permit fees to encourage deconstruction;
   - Work with municipalities to prohibit demolition without some element of deconstruction; and
   - Develop a local deconstruction guide which could include a list of reuse/recycling opportunities for various materials and best practices for using materials.
6. Support recycling of building materials:
   - Promote a region-wide deconstruction assessment for all properties to be demolished; and
   - Use municipal demolition permit system to encourage deconstruction by requiring a waste management plan.
7. Promote green building standards (e.g., LEED).
8. Continue to develop programs for managing hazardous-containing materials.
9. Develop municipal bylaw templates for construction and demolition activities.
10. Develop a CR&D industry toolkit as part of a targeted educational/promotional campaign.

3.4.4 Illegal Dumping

Illegal dumping is an ongoing challenge in the CRD and most jurisdictions. The CRD has a strong approach to reduce illegal dumping, which includes support to non-profits who collect at clean-up events, supporting reuse non-profits which have illegal dumping issues on their property, and educating residents about how to properly dispose of commonly illegally dumped items.

3.4.4.1 Challenges and Opportunities

The challenges and opportunities relating to illegal dumping in the CRD can be summarized as follows:

- Illegal dumping of bulky items is an issue (mattresses, furniture, etc.); and
- The CRD surveyed municipalities in 2011 on illegal dumping and learned that the most commonly dumped materials were furniture and mattresses. The most frequent dumping location for abandonment of materials was on municipal boulevards.

3.4.4.2 Options

Options relating to illegal dumping may include:

1. Maintain comprehensive approach to deal with illegal dumping.

2. Enhance bylaws that target waste generators.
3. Support establishing illegal dumping enforcement capacity within the municipalities and electoral areas.
4. Establish a stakeholder group to "observe, record, and report" problem areas for illegal dumping and assist enforcement.
5. *Increase bylaw enforcement for illegal dumping.*
6. *Gather data on illegal dumping in BC and the CRD.*
7. *Make legally disposing of bulky items more convenient and/or cheaper for residents by hosting a drop-off day or having a large item pick-up day.*
8. *Back-charge pick-up costs for abandoned materials if you can identify where they come from.*

SWAC Items

4.0 FINANCIAL MANAGEMENT

The financial implications of new waste diversion programs and/or initiatives need to be assessed to ensure the effects on the financial management system are sustainable or to determine whether new funding programs or increased program costs are required to balance the CRD's annual solid waste management budget.

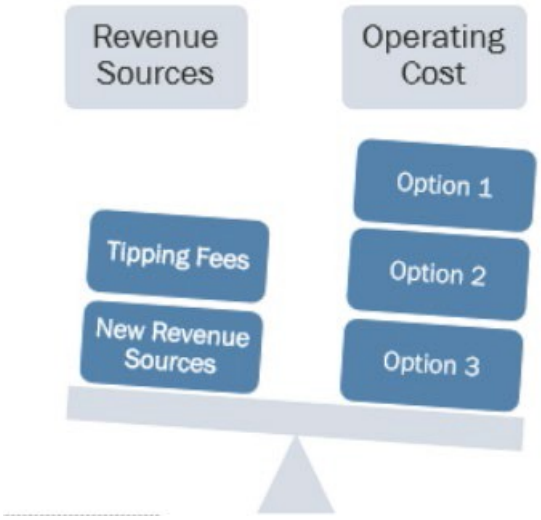


Figure 4-1: Balancing of Revenues and Operating Costs to ensure financial sustainability of solid waste management practices in the CRD.

The diagram above (Figure 4-1) illustrates how program option costs needs to be balanced out against revenue sources for the CRD.

5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Capital Regional District and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Capital Regional District, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

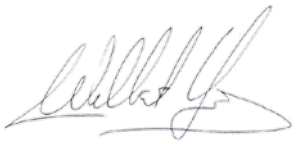
6.0 CLOSURE

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

Respectfully submitted,
Tetra Tech Canada Inc.

Prepared by:
Melissa Nielsen, EIT
Project Engineer-in-Training
Solid Waste Management Practice
Direct Line: 604.608.8638
Melissa.Nielsen@tetratech.com

Prepared by:
Claudia Castro-Miravalles, M.Sc., EP
Environmental Scientist
Solid Waste Management Practice
Direct Line: 604.608.8902
Claudia.CastroMiravalles@tetratech.com



Reviewed by:
Wilbert Yang, P.Eng.
Senior Planning Engineer
Solid Waste Management Practice
Direct Line: 604.608.8648
Wilbert.Yang@tetratech.com

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APPENDIX A

NOVEMBER SWAC MEETING NOTES

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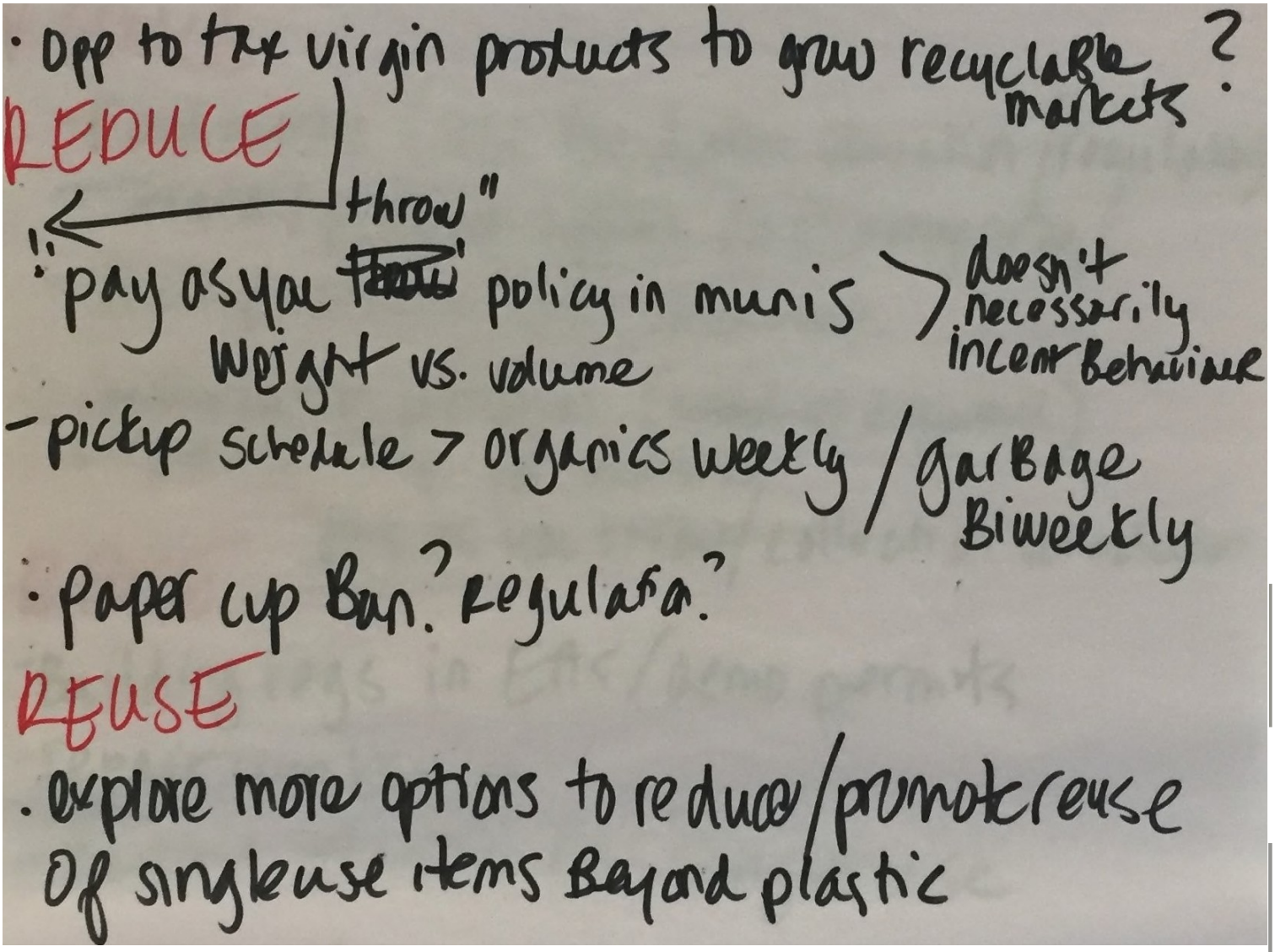

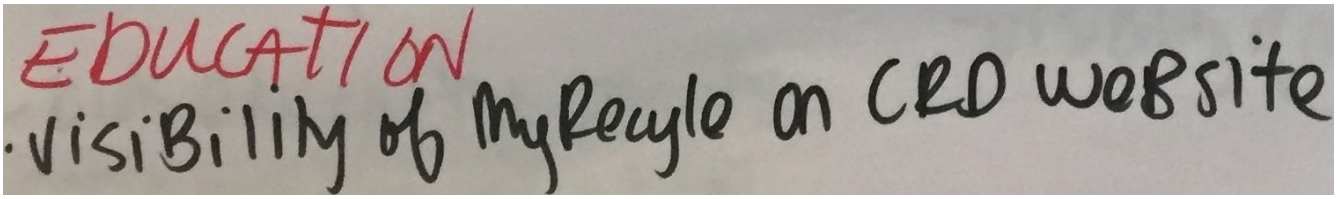

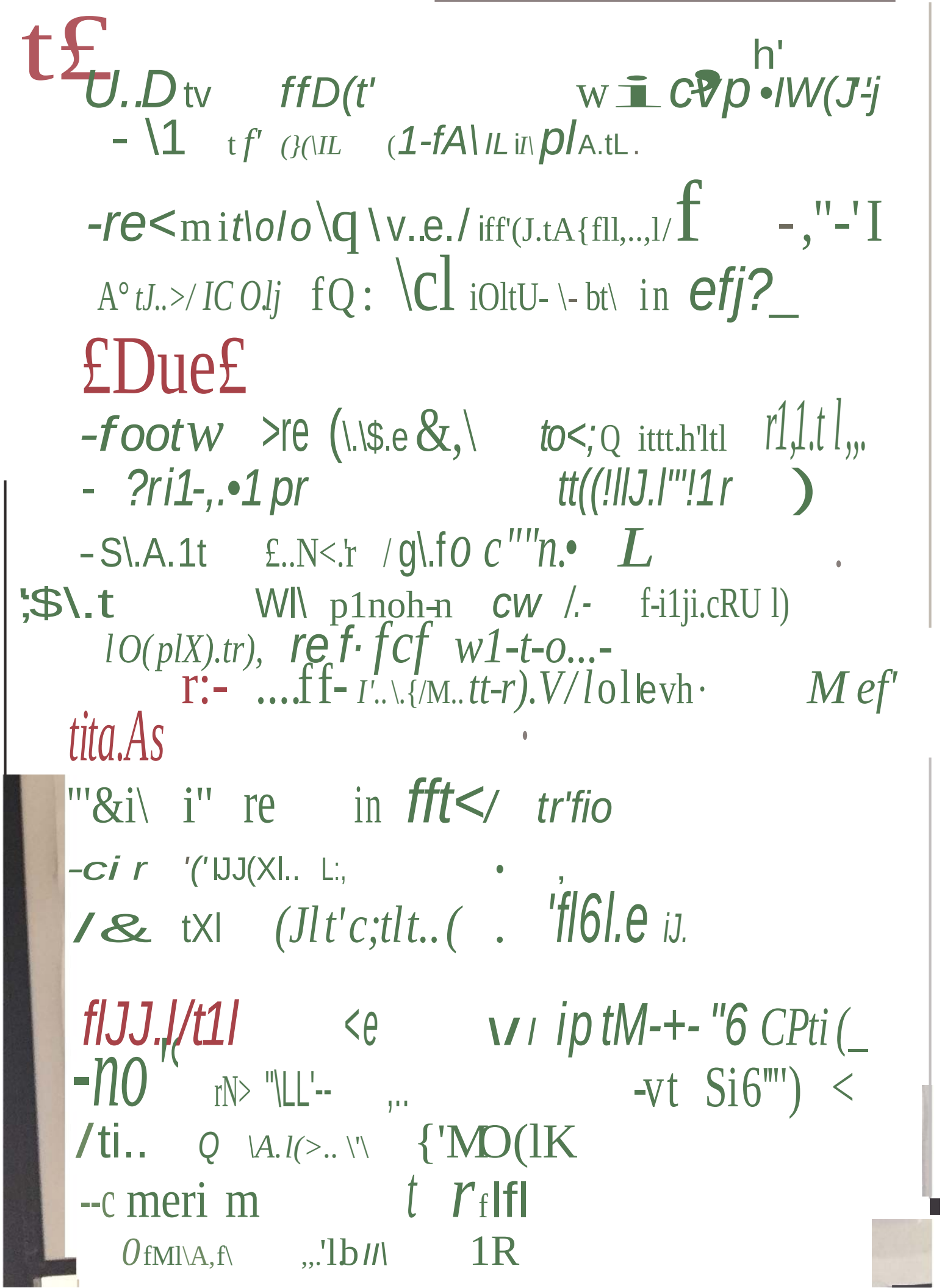

CIRCULAR ECONOMY
REDUCE
REUSE + EDUCATION

CIRCULAR ECONOMY (K-12 curriculum, internal/procurement, provincial regulations)

↳ opportunity to advocate for ICI inclusion in provincial programs.

REDUCE (promotion, rent/share progs, food waste, single use)

REUSE
(non profit support) + food recovery

- Building regulations in electoral areas (local regs getting in way of reusing items)
- demolition permits → have you thought about reuse?

EDUCATION

- largest waste producers outside of EPR / how do you reach? eg construction industry
- emphasis on impact of consumerism / influence parents
- opportunity of kids educating parents
- tax assessment opportunity to communicate?

CIRCULAR ECONOMY

- CED policy/procurement with businesses that support CE philosophy

→ profitable for all players.

REDUCE

- education re: "use By" date (+ advocate for regulation)
  ↳ true expiry date.
- support/encourage retail reuse/recovery programs re: food waste
- corporate responsibility for waste - incentives?
  - support munis

REUSE

- promotion of repair workshops. (non-profits have limited $ to promote)

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CIRCULAR ECONOMY

- institutional practices of CRD → opp with local partners like DND + RVIC?
  - ↳ develop toolkit
- terminology issue > impersonal / takes effort to understand
  - ↳ why important at personal level?
- Circling upwards to increase value of products?

REDUCE

- Support Business that promote reduced packaging / Bulk purchasing (BYO container)
- promote substitution (eg wood vs. drywall) to reduce consumption of complex materials
  - need to incent
- processing of unsellable food into animal food or other product?

REUSE

- support promotion of reuse/share resources into the region

EDUCATION

- CE > one CRD has in practice - develop/provide tool kit

EPR

- consumer awareness about take back programs

- mattresses ⇒ new EPR?

- incentive for return to retailer
  - electronics
  - mattresses

Recycle

- SFD/MFD PPP
- EPR programs
- Organics

+garbage

Construction, Renovation, Demolition

PPP

Lack of consistency examples
- glass in, glass out, NO glass services
- multiple service providers
- subsidy to SFD (glass curb) + some depots. no support for MFD residents

Garbage

- Generator targeted ban enforcement

Focused on ICI

- mandating clear bags for garbage
- collectors to provide bags (garbage, recycling, compostable

Organics

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- Hartland Facility For processing OM + capturing nutrients + energy as a viable economic & sustainable nutrients cycling (compost sales) using in-vessel (AD) & aerobic
- local processing
- compostable bag confusion (greenwashing)

- circular economy example green burial → tree

C..0 *i-S*fer.Ly ,·

'f erM"S \ v.ire deconstuction

- de t>--'-'c, *10r-* assessment

- building code inconsistency
  - allowance
  to reuse materia!

- Deconstruction Guide (eg.)
  - eg H+H services
  - asphalt recycled
  - crushed concrete, glass

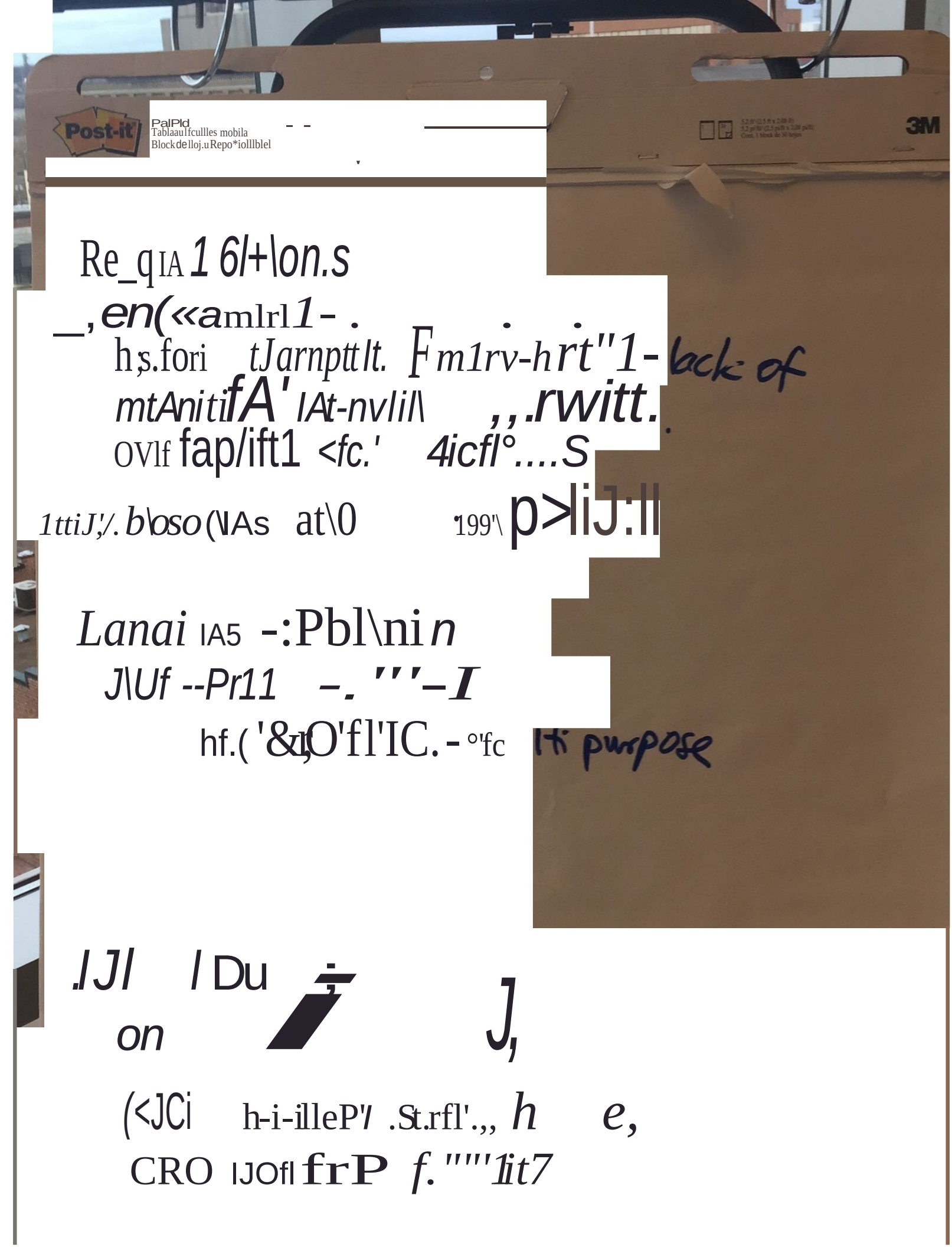
Recovery

- MKts for wood re-use
- deconstruction

- LFG Capture
- LFG Utilization — w no immediate solids instead
- MKts for clean Wood Waste
  - Hog fuel
- New technology
  - wood composites (innovation)
  - energy recovery (WTE, gasification) — Wood Waste + Sewage sludge
  - chip + use as additive
  - chip + use
- brochure

Residual Mgmt

- Fill plan
- Diversion Max — Bing et al.
- Maximize disposal capacity Hartland
  - Existing Landfill
    - re-mine + process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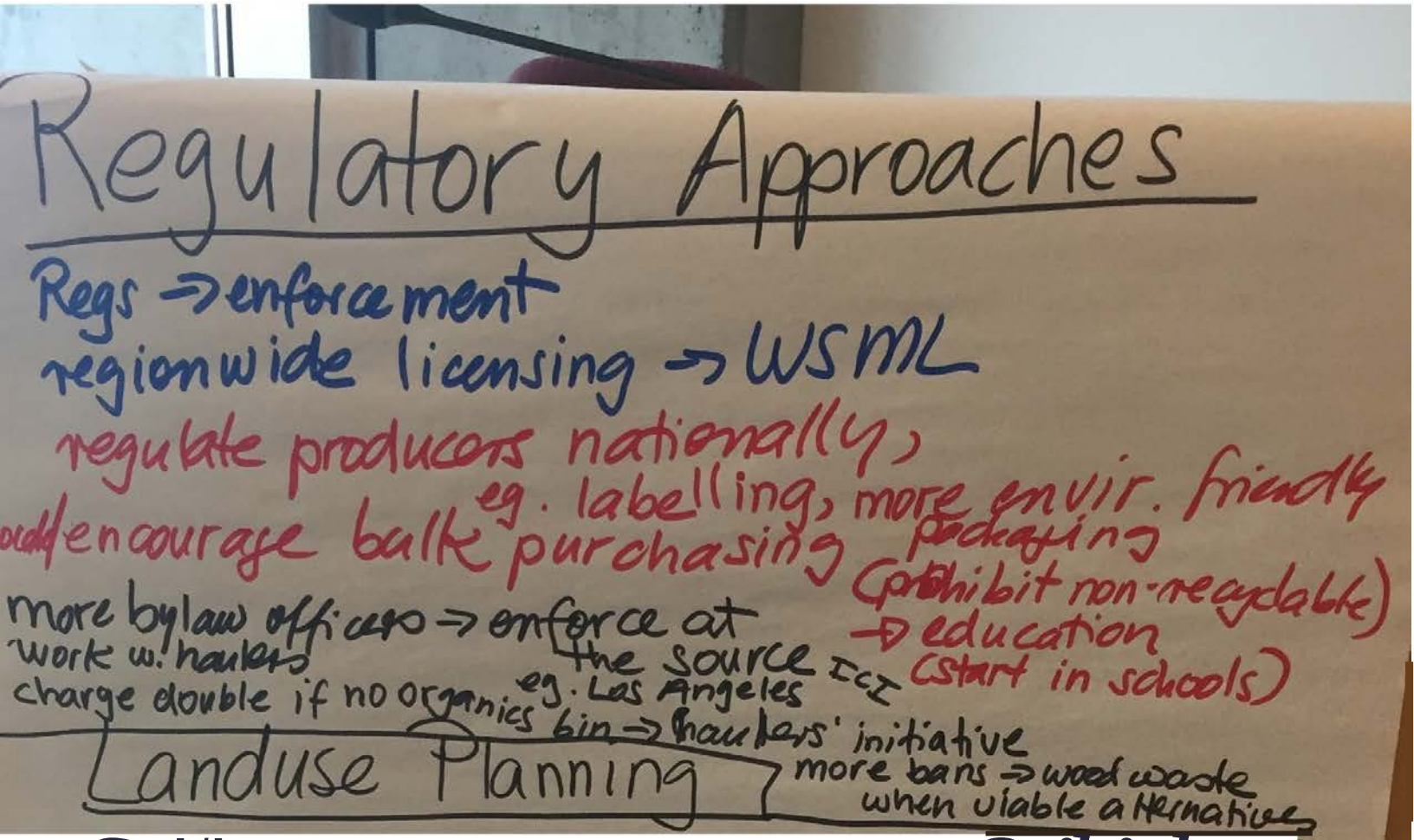

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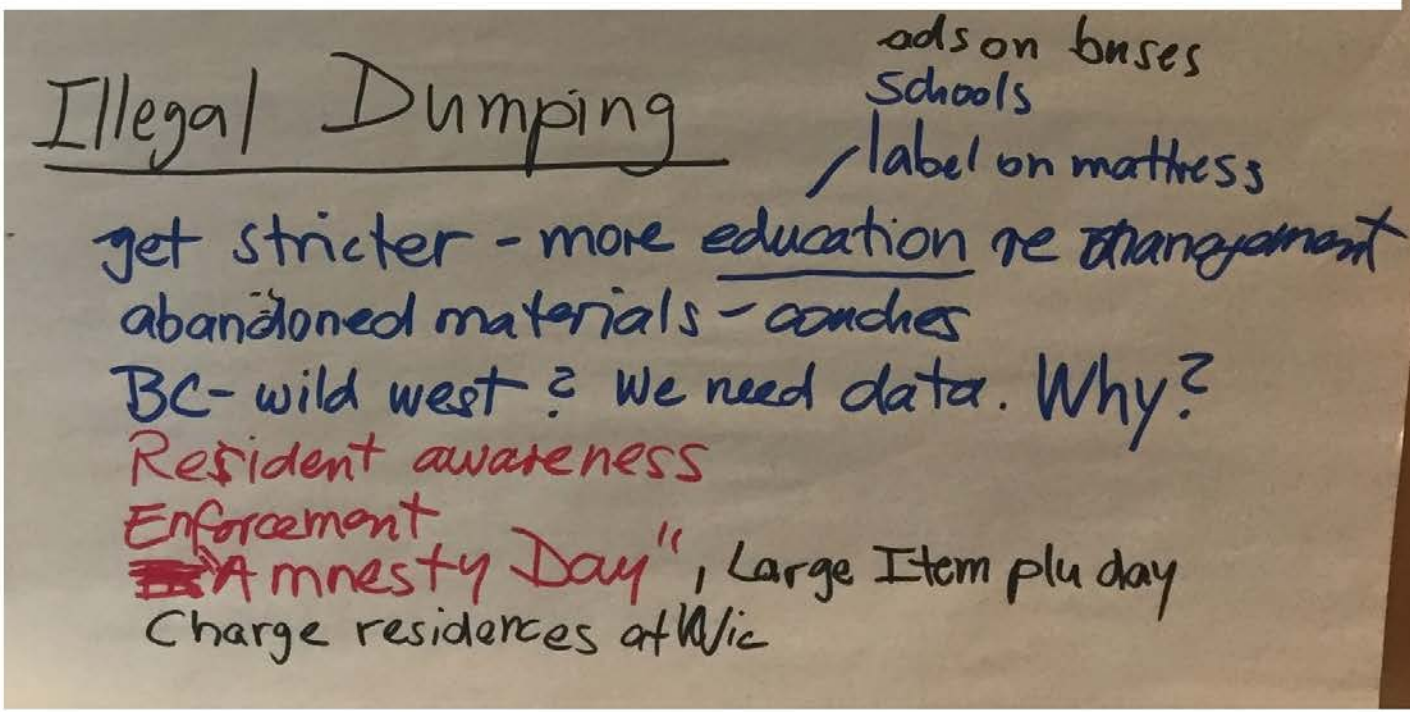

APPENDIX B

TECH MEMO:
PRELIMINARY STRATEGIES FOR THE SOLID WASTE MANAGEMENT PLAN

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Anke Bergner, Tom Watkins, Russ Smith	**Date:**	March 7, 2019
c:		**Memo No.:**	003
From:	Wilbert Yang, Melissa Nielsen, and Claudia Castro	**File:**	704-SWM.PLAN03075-01
Subject:	Preliminary Strategies for the Solid Waste Management Plan V2		

1.0 INTRODUCTION

Tetra Tech Canada (Tetra Tech) was retained by the Capital Regional District (CRD) to identify and evaluate potential waste management strategy options for Revision 3 of the Solid Waste Management Plan (SWMP). This Technical Memorandum (tech memo) discusses the preliminary strategies and actions proposed for consideration in the SWMP. This tech memo will also describe the Evaluation Process that will be used to further refine the strategies.

The CRD's Solid Waste Advisory Committee (SWAC) was presented with an initial long list of potential strategy options during meetings on November 15, 2018 and January 17, 2019 and provided feedback during these meetings.

1.1 CRD SWMP Revision 3

The proposed process and timeline to review, evaluate and select strategy options for Revision 3 of the SWMP is illustrated on Figure 1.

Notably, some changes have been made to the timeline:

1. The dates of the third, fourth, and fifth SWAC meetings have been changed to the dates shown on Figure 1, below.
2. The third meeting, now on March 12th, 2019, will be used to present preliminary strategies.
3. The fourth meeting, now on April 9th, 2019, will be used to present the Strategy Evaluation which will assist in identifying preferred strategies, actions and timelines.

Tetra Tech Canada Inc.
Suite 1000 – 10th Floor, 885 Dunsmuir Street
Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

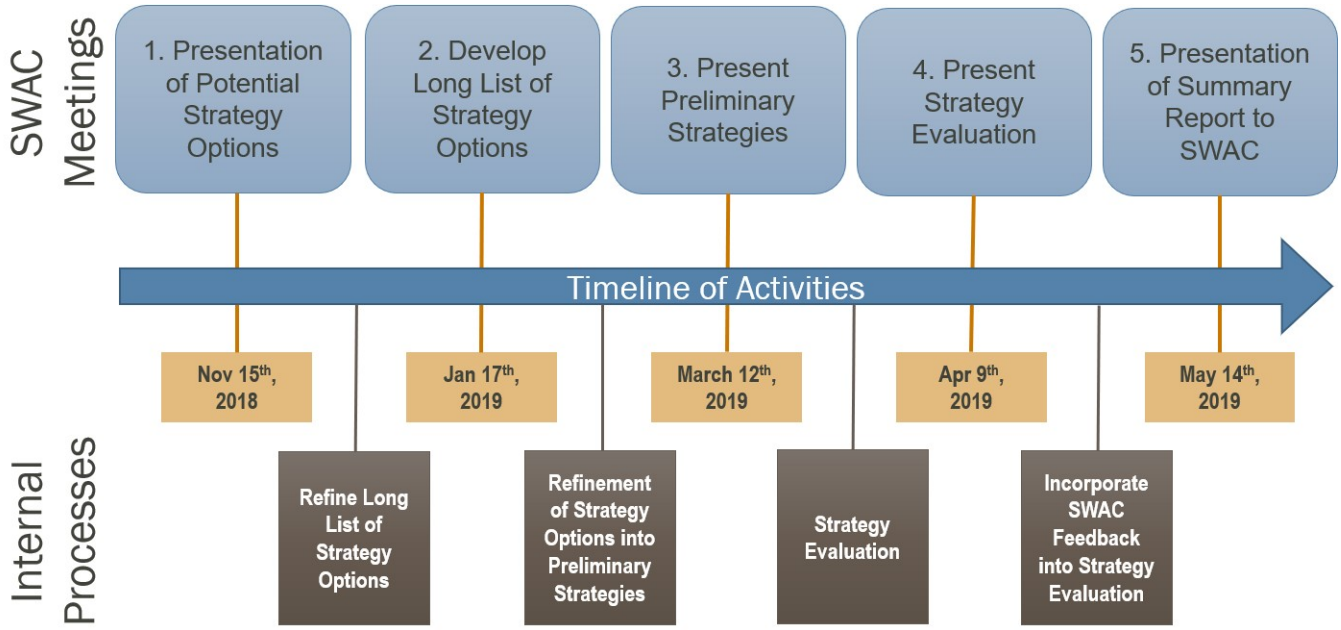

Figure 1: Timeline of SWMP Revision Process (From Strategy Options to Strategies: Review, Evaluate and Select)

The list of proposed preliminary strategies in this tech memo forms a basis for discussion for the March 12, 2019 SWAC meeting. At this meeting, the SWAC will be asked to further elaborate and refine the strategies and actions. After this meeting, Tetra Tech will use an evaluation process (further described in Section 3.0) and work with the CRD to evaluate strategies. The evaluated strategies will be presented at the SWAC Meeting on April 9, 2019.

2.0 STRATEGY REFINEMENT PROCESS

2.1 Strategy Groupings

A long list of strategy options was presented at the January 17, 2019 SWAC meeting. The Ministry Guide recommends describing plan strategies and actions for each tier in the pollution prevention hierarchy, with the expectation that strategies are maximized to reduce, reuse and recycle. The Guide recognizes that certain strategies, such as educational programs, could be summarized separately or integrated into other broader strategies. The Guide also asks regional districts to encourage opportunities that will contribute towards the establishment of a circular economy and to consider upstream as well as downstream environmental impacts of products, from production to end-of-life management.

Based on this guidance, the long list of potential strategy options was organized into the following groupings:

- Circular Economy (including education and behavior change, advocacy, and policy development);
- Reduce and Reuse;
- Recycle (including increasing overall diversion, printed paper and packaging [PPP], extended producer responsibility [EPR], and organics); and
- Recovery and Residuals Management (including recovery, residuals management, construction, renovation and demolition waste, and illegal dumping).

The grouping of the strategy options was intended to:

- Transform the mindset of the plan to a Circular Economy context in the CRD to encourage a shift in thinking from waste as a residual requiring disposal, to waste as a material/resource that is a valued commodity that should only be consumed when necessary and utilized in closed-loop systems, as stated in the Ministry's guiding principle (Ministry Guide, 2016);
- Incorporate strategy options that do not fit into one of the 5 R categories of the Pollution Prevention Hierarchy into the Circular Economy grouping to recognize that some options could work at multiple levels of the hierarchy and throughout different areas in the system. (e.g., education and behaviour change);
- Incorporate suggested strategy options from the 2012 to 2014 SWMP Update in a straightforward way, as all previous options were grouped according to the Pollution Prevention Hierarchy; and
- Demonstrate the preferred order of strategy options according to the Pollution Prevention Hierarchy. As per the Ministry Guidelines, options at higher levels in the Pollution Prevention Hierarchy should be prioritized because "actions taken at higher levels in the pollution prevention hierarchy can eliminate or reduce the environmental management costs of actions at lower levels."

During the January SWAC Meeting, it was noted that the 'Circular Economy' grouping was confusing and that more discussion was needed about the term and how to incorporate Circular Economy principles into the SWMP.

Circular Economy is defined by the Ministry as "*An alternative to a traditional linear economy (make → use → dispose). The circular economy keeps resources in use for as long as possible, extracts the maximum value from them while in use, then recovers and regenerates products and materials at the end of their service life*." Circular Economy approaches typically take into consideration supply chain management and manufacturing of goods. For this reason, it is thought that framing the CRD's entire SWMP Revision in the context of the Circular Economy may

not be appropriate; rather, it is proposed to identify Circular Economy opportunities into the strategies as appropriate.

Thus, the strategy options have been regrouped to simplify the intent of the Strategies according to the following themes, which are also aligned with the Pollution Prevention Hierarchy:

- Reduce and Reuse;
- Recycle;
- Recovery and Residuals Management; and
- Financial Management (not a focus of this Tech Memo).

2.2 Refinement of Strategy Options into Preliminary Strategies

The SWAC provided feedback on the long list of strategy options that were presented in the November and January SWAC Meetings. An extensive amount of feedback was received, and all feedback was incorporated into a comprehensive long list of strategy options (over 100 options were included). Appendix A provides a list of additional suggestions and comments recorded on a flipchart from the January 2019 meeting. Comments received from three SWAC members after the meeting have been considered and incorporated into the Strategies as appropriate.

Tetra Tech and CRD staff examined each suggestion and grouped them into themes. These themes were restructured and short-listed into thirteen preliminary strategies with associated actions presented in this technical memorandum. Most options were incorporated into themes. The strategy options that were not considered were the ones that met the following reasons:

- The intent of two or more options were the same (in this case, only one option was kept);
- The option suggested was outside of the CRD's jurisdictional authority; and/or
- The option was very vague and not actionable or would be a piece of other strategies (e.g., "Review CRD Bylaws" was removed because this would be a required implementation piece in other strategies but does not constitute an option in itself. For example, if a new material ban is proposed, this would result in a revision of the CRD Hartland Landfill Tipping Fee Bylaw.).

As the themes were revised into preliminary strategies, the specific wording of most strategy options was changed. These changes were made to:

- Enhance clarity;
- Combine the intent of multiple similar strategy options; and/or
- Ensure that the revised strategy included only actions which were within the CRD's jurisdictional authority (e.g., "Mandate collector to provide bags for organics collection" became "Develop guide for use of compostable products and packaging to reduce the impacts of compostable plastics in processing").

The preliminary Strategies are presented in Section 4.0.

3.0 EVALUATION PROCESS

The objectives of the Evaluation Process will be to:

1. **Gather SWAC feedback on the Preliminary Strategies and Associated Actions.** This will be reviewed during the March SWAC meeting.

2. **Assess the Strategies according to the Evaluation Criteria.** The evaluation criteria have been adjusted slightly since the last meeting and are presented in Table 1. An example of how the evaluation process would be conducted has been included in Appendix B. This step will assist in prioritizing the strategies

Table 1: Evaluation Criteria Modifications

Old Evaluation Criteria	Modified Evaluation Criteria	Reason for Change
Technical Criteria	Technical Feasibility and Effectiveness	Enhanced clarity – the intention of this criteria is to determine: ▪ Is this technically possible? ▪ If implemented, would this strategy be effective?
Environmental Criteria	Environmental Impact and Benefits	Enhanced clarity
Social Criteria	Social Impact	Enhanced clarity
Impact on Disposal Capacity	Effect on Waste Disposal	Enhanced clarity
Economic Criteria	Cost Considerations	Enhanced clarity

3. **Determine high-level cost considerations and resource requirements for each strategy.**

4. **Identify how strategies would be implemented according to the CRD's resources over the next 10 years.** Based on cost considerations and conceptual ranking, Tetra Tech will work with the CRD to identify a suitable timeline for the strategies.

5. **Create a 10-year disposal target.** Based on the proposed timeline, a diversion potential analysis will be performed, which will result in the ability to set a disposal target, and interim disposal targets, if desired. The Ministry's current 2020 disposal target is 350 kg/capita.

The results of the Evaluation Process will be presented at the April SWAC meeting.

Figure 2 outlines the proposed evaluation process.

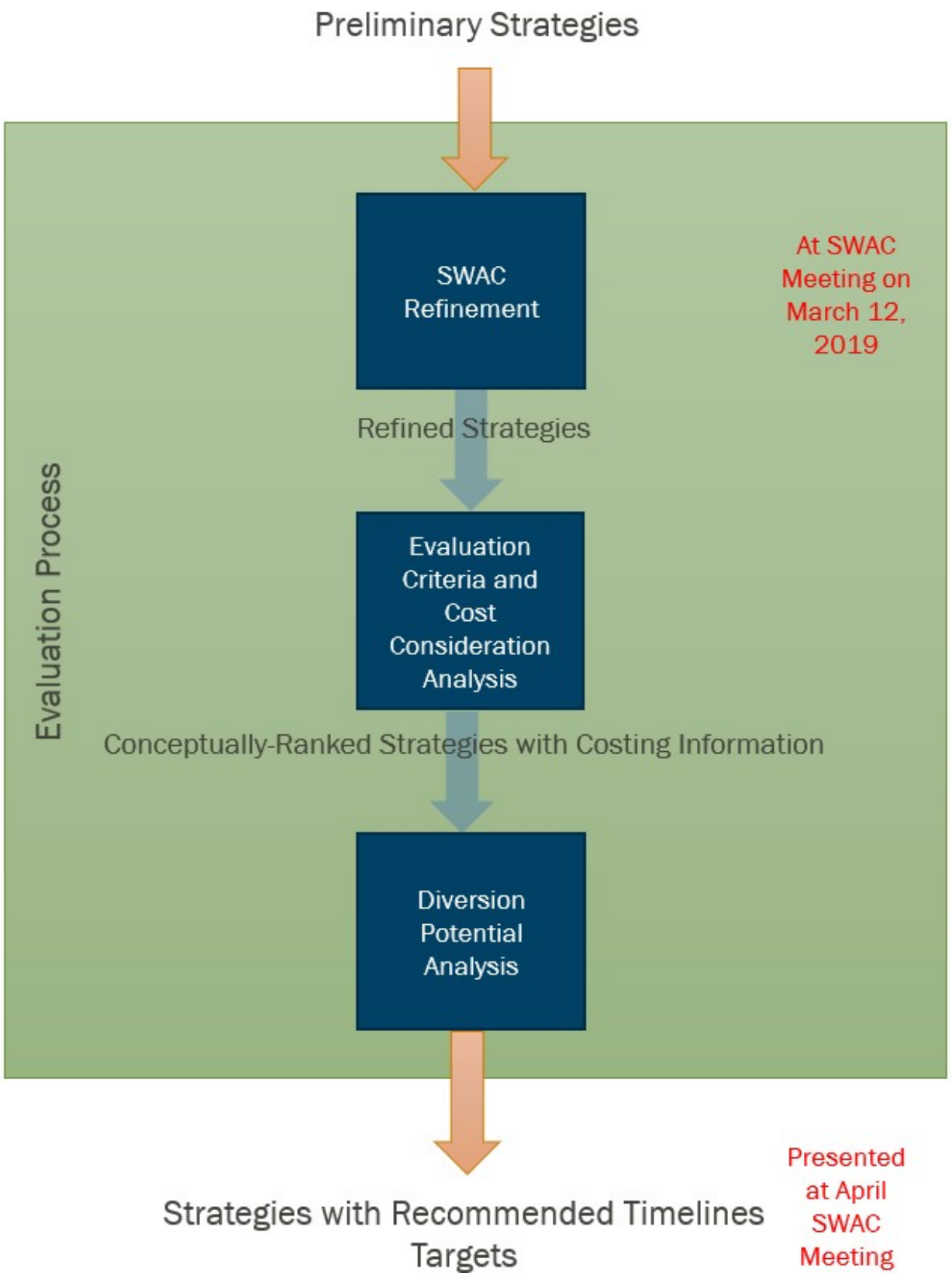

Figure 2: Evaluation Process Flow Diagram

4.0 STRATEGIES

The preliminary strategies that are presented for SWAC Review are outlined in this section. Figure 3 presents the summary of strategies. Strategies are presented with their action items in Sections 4.1, 4.2, and 4.3.

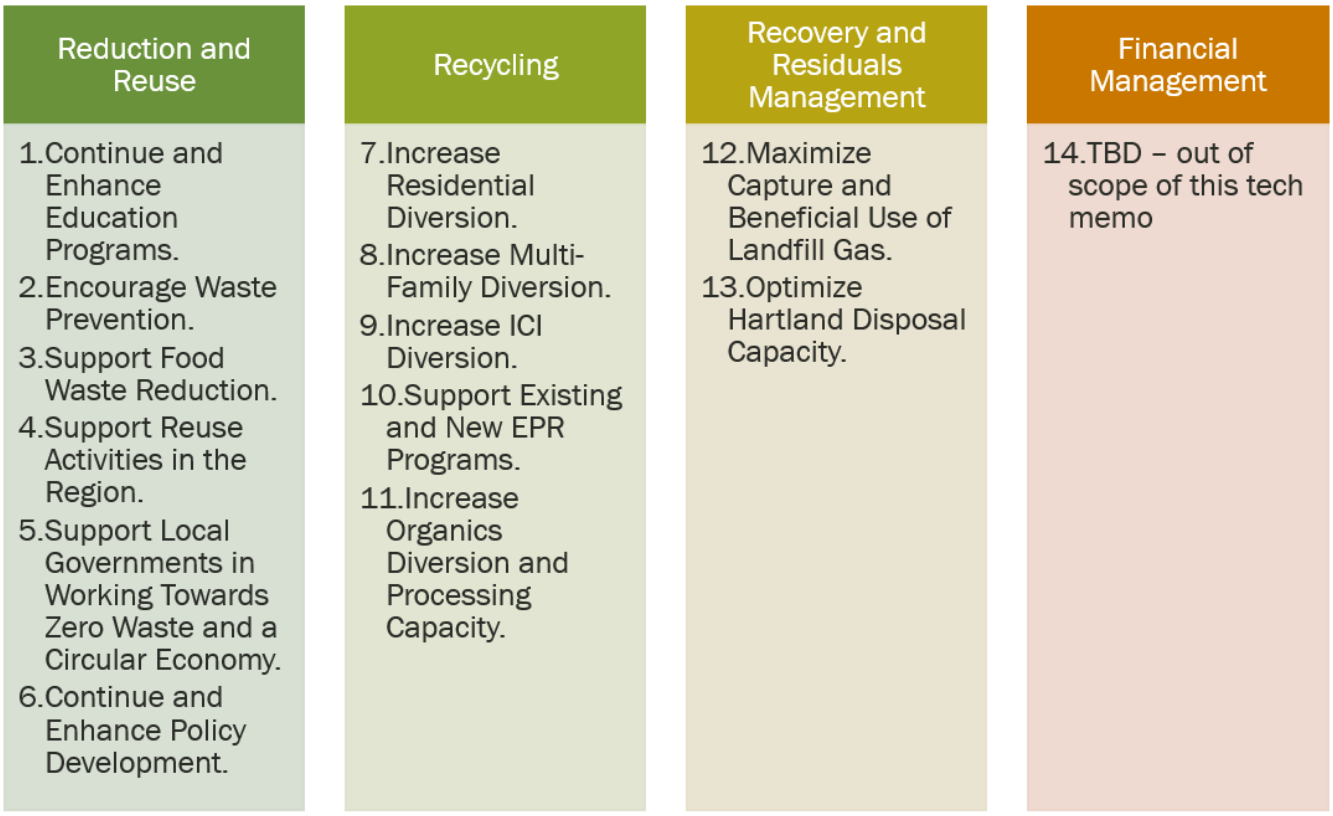

Figure 3: Summary of Strategies

4.1 Reduction and Reuse

1. **Continue and Enhance Education Programs.**
    a. Ensure adequate CRD promotion and education resources.
    b. Incorporate behaviour change components wherever possible; using a variety of education and communication strategies and tools.
    c. Expand education programs to MF and ICI sector.
    d. Enhance K-12 school program to include concepts of circular economy and explain 'wish-cycling'.
    e. Promote less consumption and advocate for consumer responsibility.
    f. Collaborate with stakeholders on education campaigns, e.g. municipalities, product stewards.
    g. Continue supporting environmental stewardship recognition.
    h. Continue to engage residents on solid waste matters; using the appropriate level of consultation.
2. **Encourage Waste Prevention**
    a. Establish a waste reduction community grant program (could include food waste prevention projects).
    b. Support single-use item reduction efforts such as plastic bag bans.
    c. Advocate provincially and federally to limit or eliminate the manufacturing, distribution or sale of single use items and non-recyclable materials.
    d. Advocate provincially and federally for sustainable product design.
    e. Promote sustainable and/or packaging-free purchasing options.
3. **Support Food Waste Reduction.**
    a. Support residential food waste reduction, for example, by continuing Love Food Hate Waste Canada program.
    b. Support ICI food waste reduction, for example, by encouraging stores to donate edible food.
    c. Continue to support food recovery organizations.
    d. Advocate for regulation to clarify use-by versus Best Before dates.
4. **Support Reuse Activities in the Region.**
    a. Continue to provide funding to non-profits to help offset garbage tipping fees for unusable donated items.
    b. Continue to support and promote donations to reuse establishments.
    c. Promote reuse events, such as community swaps.

d. Support renting and sharing programs, such as tool libraries, repair cafes and sewing hubs.

e. Support enhancement of materials exchange activities, such as online swaps.

f. Investigate free store at Hartland landfill or other facilities.

5. **Support Local Governments in Working Towards Zero Waste and a Circular Economy.**

a. Develop model bylaws and best practices for use by municipalities and electoral areas.

b. Develop model language for OCPs and Economic Development strategies.

c. Work with municipalities and electoral areas to identify the need for solid waste facilities and increase zoning for waste management activities.

d. Use policy tools to enable local recycling infrastructure.

e. Continue user pay refuse collection.

f. Investigate use of clear bags for garbage or recyclables collection, where practicable (e.g. at events).

6. **Continue and Enhance Policy Development.**

a. Develop model procurement policies.

b. Continue to expand material bans when viable alternatives exist.

c. Investigate licensing waste management facilities in the region.

d. Investigate regulatory mechanisms to manage municipal solid waste and recyclable materials in the region.

e. Work with municipalities and electoral areas to investigate open burning restrictions.

4.2 Recycling

7. **Increase Residential Diversion.**

    a. Continue to promote diversion of recyclable materials.

    b. Support depot diversion efforts in the region for non-curbside materials.

    c. Encourage local markets for recyclables.

    d. Develop a guide to support event recycling.

8. **Increase Multi-Family Diversion.**

    a. Consider allocating resources to support MF recycling, for example, by developing standardized education materials.

    b. Work with municipalities to develop waste source separation requirements.

    c. Develop policy guide for recycling, composting and garbage space and access in multi-family developments.

9. **Increase ICI diversion.**

    a. Consider allocating resources to increase ICI diversion, for example, a business waste reduction liaison.

    b. Advocate for ICI PPP.

    c. Create a business waste reduction toolkit, including education about how to apply Circular Economy principles.

    d. Encourage municipalities to require waste management plans with business licenses.

    e. Develop policy guide for ICI space and access requirements.

    f. Work with municipalities to develop ICI waste source separation requirements.

    g. Investigate shifting disposal ban enforcement to generator, rather than hauler.

10. **Support Existing and New EPR Programs.**

    a. Advocate to the province to expand EPR programs.

    Note: The Province is currently conducting an EPR gap analysis and considering adding new materials.

    b. Collaborate with stewards to increase consumer awareness about EPR programs.

    c. Advocate for increased return-to-retailer opportunities.

    d. Create a CRD/EPR “interface plan” to define the role of stewards in solid waste management.

    e. Advocate federally to standardize EPR programs across Canada.

11. **Increase Organics Diversion and Processing Capacity.**

    a. Continue to promote organics waste diversion.

    b. Investigate developing a resilient local organics processing infrastructure.

       Note: The CRD Board has directed staff to issue a RFEOI for an in-region or near-region organics processing facility.

    c. Investigate options to standardize organics collection services.

    d. Support compost markets by purchasing back materials.

    e. Develop guide for use of compostable products and packaging to reduce the impacts of compostable plastics in processing.

4.3 Recovery & Residuals Management

12. **Maximize Capture and Beneficial Use of Landfill Gas.**

    a. Continue to capture landfill gas for beneficial use.

       Note: The CRD Board has directed staff to investigate landfill gas utilization options.

    b. Investigate collaboration opportunities with educational institutions to research new beneficial uses and technologies.

13. **Optimize Hartland Disposal Capacity.**

    a. Review ban enforcement levels, subject to recycling market conditions.

    b. Continue to operate Hartland landfill using best practices.

    c. Develop design options to maximize disposal capacity until 2100 and beyond.

       Note: A new fill plan is in development. Design and aggregate management options could extend landfill life significantly.

    d. Continue to conduct research and investigate emerging technologies.

4.4 Financial Management

14. **Develop a Sustainable Financial Model.**

TBD – pending CRD Board decisions on concurrent projects and results of evaluation of strategy options.

5.0 CLOSURE

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

Respectfully submitted,
Tetra Tech Canada Inc.

Prepared by:
Melissa Nielsen, E.I.T.
Project Engineer-in-Training
Solid Waste Management Practice
Direct Line: 604.608.8638
Melissa.Nielsen@tetratech.com

Reviewed by:
Wilbert Yang, P.Eng.
Senior Planning Engineer
Solid Waste Management Practice
Direct Line: 604.608.8648
Wilbert.Yang@tetratech.com

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APPENDIX A

JANUARY 17, 2019 SWAC MEETING FLIPCHART NOTES ON LONG LIST OF OPTIONS

Solid Waste Advisory Committee – January 17, 2019
Flipchart Notes
CRD Longlist Options

EDUCATION

- We need to provide more detail on current waste management practices while at the same time also look to the future.
- We need a clear definition of circular economy.
- More could be done with the multi-family and ICI sectors.
- Modify K-12 programs to reflect differences between different programs/sectors: ICI versus residential.
- Move from education to behavior change.
- Educate consumers about products and their recycling options.
- Education of citizens is missing, e.g. we need to reach parents, not just children.
- "Wish cycling" education is important; starting with children.
- How can we reach the 10% who don't care?
- Generational change requires an evolving toolkit.
- We need more environmental assessment/rating tools for various products e.g. how much recycled content a product contains.
- We need to develop contract language to improve environmental performance.

ADVOCACY

- Municipalities and Regional Districts should collaborate on a joint approach and act as a single voice to strengthen the process.
- Advocate to EPR stewards to provide more data, etc.
- The EPR gap analysis by the province is a positive step.
- How can citizens become a voice? Can we collect all concerns and create one voice?

POLICY DEVELOPMENT

- Bans should be based on environmental merit as opposed to economic impacts.
- Some current CR&D policy approaches restrict recycling.
- How can we use policy to address weather impacts such as the recent wind storms on Salt Spring Island, e.g. reduce air pollution through burning regulations, replace slash pile burning with chipping, permaculture?
- Franchising could eliminate smaller companies, may reduce competition.
- Licensing: adds extra financial burden for operators.

- OCP's: the intention is to create language as the CRD is not responsible for OCPs.
- We need policies that are adaptable to address changing technologies.
- Are education, advocacy and policy sufficient fora circular economy?
- Could we frame the whole SWMP in terms of circular economy?
- Licensing may deter new facilities and create overlapping jurisdictions e.g. provincial Organic Matter Recycling Regulation (OMRR) vs. regional district regulations and impacts on neighboring properties.
- Address lack of data: municipalities could require waste management plans when businesses are applying for a business license.

REDUCE/REUSE

- Is there a possibility of a free store at Hartland – e.g. reuse furniture, share shed, redirect reusable items.
- Consider the full life cycle impact of single use items vs multiuse items.
- Educate people about responsible donation of gently used items.
- Look at all alternate uses e.g. for glass.
- Recycling often results in lower quality materials/end uses.
- Are there local reuse options for glass?
- Definition of end use can be a challenge and there is also a challenge what to do with glass.
- How to deal with incidental/small pieces of metal e.g. bits of fencing. Are there enough scrap metal bins within the community?

RECYCLE – INCREADSING OVERALL DIVERSION

- Enforcement at generator level is difficult. There are too many generators to inspect. Possibly conduct generator audits.
- Audits of loads may be more realistic; however, many loads contain waste from a number of customers.
- Make it a requirement that generators have bins for banned materials – if they do not, charge a higher rate to pick up or dispose of their garbage.
- Private sector role is different from government. Government should create the landscape to incent private sector investment.
- Proposal to use clear plastic bags like in other jurisdictions.
- Use of clear plastic bags depends on collection method. There are different operational approaches, for example, many collectors use totes. Drivers already do a visual check.
- Allowing use of compostable bags undermines compost industry efforts and affects compost quality.
- Expand waste diversion efforts to the ICI sector – shift the focus from residential.

RECYCLE – PPP

- The multi-family (MF) and industrial, commercial, institutional (ICI) sectors receive service by private sector companies – more education is ok/needed.
- There seems to be a technological gap in handling flexible packaging.
- Educate about the impact of contamination on recyclability of materials.
- Flexible packaging lets producers off the hook. They should design for recycling. We should consider advocacy for better environmental design.
- Local governments (LG) can support local recycling – for example, they can bridge the gap through green procurement practices.
- Federal government funding for plastics recycling is happening.
- Can LG fund infrastructure? Procurement is an option.

RECYCLE – EPR

- What is the definition of producer: first to import into the province.
- Most first import manufacturers/retailers would be outside of CRD; we need to get local stats.
- Advocate for other provinces to adopt the EPR model.
- Increase return to retailer opportunities.
- The Council of Canadian Ministers of the Environment (CCME) already has an action plan for national EPR programs.
- EPR waste categories: what are we looking for? They should be based on cradle to cradle, circular economy principles.
- The Province of BC approves stewardship plans, not the CRD.
- People don't know what materials fall under EPR.

RECYCLE – ORGANICS

- Existing facilities on the island can handle feedstock and need more volume.
- The worksheet should list that the organics facility Request for Expression of Interest (RFEOI) included Salt Spring Island (SSI).
- The challenge is to move finished compost products – municipalities and regional district should take back compost made from their own kitchen scraps and yard waste materials.
- Volume: supply and demand is currently insufficient; however, in the future there may be an oversupply. Require municipalities take back equivalent to what they send in.
- The province has tools/options to increase demand through policy requiring e.g. re-vegetation and highway restoration.
- Large vs. smaller facilities – which is preferable?

- Size of facilities is based on economies of scale.
- Concern that high-volume facilities can cause issues.

RECOVERY

- Use existing education institutions to investigate/research new technologies.
- Go beyond 'monitoring' new technologies as clean wood waste markets exist (Harmac, Catalyst).
- How to get it to market is an issue – the challenge is the cost of diversion.

RESIDUALS MANAGEMENT

- No comments.

CR&D MATERIALS

- How much is there? We need to estimate future CR&D quantities.
- Conduct a capacity analysis, including future trends.
- Volume estimation should be based on future population estimates and projected housing needs.
- Q: What is the intent of a centralized processing facility mentioned in the worksheet? A: The intent of the language is to ensure processing capacity. Comment: We already have facilities.
- The preferred way to deal with CR&D materials is to separate materials at the construction/demolition site. Accepting mixed loads of CR&D at the landfill competes with this approach and undermines separation.

ILLEGAL DUMPING

- We need an educational initiative on consequences of this activity aimed at citizens.
- Keep the landfill open landfill – expand to 7-day week.
- What about a free drop off day?
- Free day creates challenges – haulers get stuck in traffic for hours waiting in line.

APPENDIX B

SAMPLE EVALUATION

Strategy	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
3. Support Food Waste Reduction a. Support residential food waste reduction, for example, by continuing Love Food Hate Waste Canada program. b. Support ICI food waste reduction, for example, by encouraging stores to donate edible food. c. Continue to support food recovery organizations. d. Advocate for regulation to clarify Use-By versus Best Before dates.	▪ Nationwide efforts exist to reduce food waste, especially as data on the enormous quantity of food being wasted comes into public view (recent estimates show that more than half of all food in Canada is being wasted).[1] ▪ Research has shown that avoidable household food waste can be reduced by up to 15% with an intensive Love Food Hate Waste campaign.[2] ▪ Several Canadian retailers (e.g., Save-On Foods and Walmart) have committed to reducing food waste and partners may exist (e.g., FoodMesh Food Recovery Program[3]) to catalyze food waste reduction in the ICI sector. ▪ Research has shown that restaurants can save up to $7 in operating costs for every $1 invested to reduce kitchen food waste, thus providing a powerful incentive to build upon.[4] ▪ The National Zero Waste Council, a leadership initiative advocating for waste prevention in Canada, advocates regulating for clarity around Best Before dates. Date labelling guidance exists from organizations such as ReFed in the US and WRAP in the UK.[5]	12% of the material disposed at Hartland is edible food waste (18,523 tonnes)[6], and food waste disposed in landfills is a significant source of greenhouse gas emissions. However, much of the landfill gas is currently captured (61.8% in January 2016)[7] and turned into electricity, and the landfill gas system may be upgraded, which would likely increase the capture rate. Additionally, wasted food embodies significant amounts of wasted resources (energy, water, etc.) that were required to grow, produce, and distribute that food. Reducing the amount of food wasted by one tonne has the equivalent effect on CO_2 emissions as taking one car off the road for a year.[8]	Residents directly benefit financially when they reduce food waste. Estimates of money spent on wasted food per household in Canada range from $1,100[8] to nearly $1,800[1] annually. Strategy 3a directly encourages residents to waste less food, thereby encouraging consumer savings in their food budgets. Strategy 3d may indirectly result in cost savings to residents, as residents will waste less food and money if they understand when an item is truly no longer edible. Local non-profits benefit twofold from this strategy: Strategy 3b encourages local businesses to donate edible food, which results in an influx of food to local charities. Strategy 3c supports food recovery organizations in the region directly.	Edible food waste makes up a large proportion of the materials disposed at Hartland (12%)[6]. One study demonstrated that an intensive Love Food Hate Waste campaign reduced household food waste by up to 15%. With Strategy 3a, similar results in the CRD (a 'best-case scenario') could yield a disposal reduction of approximately 1,400 tonnes (a 1% reduction). ICI food waste reduction (Strategy 3b) could have a more significant impact on tonnage: each year, the ICI sector disposes of over 9,000 tonnes of edible food.	**16**	This strategy does not require any additional new funding.
Score (High- 5, Medium – 3, Low – 1)	High	High	High	Low		

[1] Second Harvest, 2019 (https://secondharvest.ca/wp-content/uploads/2019/01/Avoidable-Crisis-of-Food-Waste-The-Roadmap-by-Second-Harvest-and-VCMI.pdf)
[2] WRAP UK, 2012 (http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf)
[3] Food Mesh (https://foodmesh.ca/)
[4] Champions 12.3 (https://champions123.org/wp-content/uploads/2019/02/Report_The-Business-Case-for-Reducing-Food-Loss-and-Waste_Restaurants.pdf)
[5] National Zero Waste Council, 2018 (http://www.nzwc.ca/focus/food/national-food-waste-strategy/Documents/NZWC-FoodLossWasteStrategy.pdf)
[6] Capital Regional District, 2016 (https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/WasteCompositionStudy2016.pdf?sfvrsn=4)
[7] Maura Walker and Associates, Capital Regional District Solid Waste Management Plan Existing Solid Waste Management System, 2018.
[8] Love Food Hate Waste, 2017 (https://lovefoodhatewaste.ca/about/food-waste/)

APPENDIX C

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LIMITATIONS ON USE OF THIS DOCUMENT

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APPENDIX C

TECH MEMO:
STRATEGY EVALUATION FOR THE SOLID WASTE MANAGEMENT PLAN

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Anke Bergner, Tom Watkins, Russ Smith	**Date:**	April 5, 2019
c:		**Memo No.:**	004
From:	Wilbert Yang, Melissa Nielsen	**File:**	704-SWM.PLAN03075-01
Subject:	Strategy Evaluation for the Solid Waste Management Plan		

1.0 INTRODUCTION

Tetra Tech Canada (Tetra Tech) was retained by the Capital Regional District (CRD) to identify and evaluate potential waste management strategy options for Revision 3 of the Solid Waste Management Plan (SWMP). This Technical Memorandum (tech memo) discusses the Strategy Evaluation and resulting refined strategies and actions proposed for consideration in the SWMP and the Strategy evaluation process that is in progress.

The CRD's Solid Waste Advisory Committee (SWAC) was presented with initial strategies during the SWAC meeting on March 12, 2019 and provided feedback during these meetings. This feedback is presented in Appendix A.

1.1 CRD SWMP Revision 3

The process and timeline to review, evaluate and select strategy options for Revision 3 of the SWMP is illustrated on Figure 1.

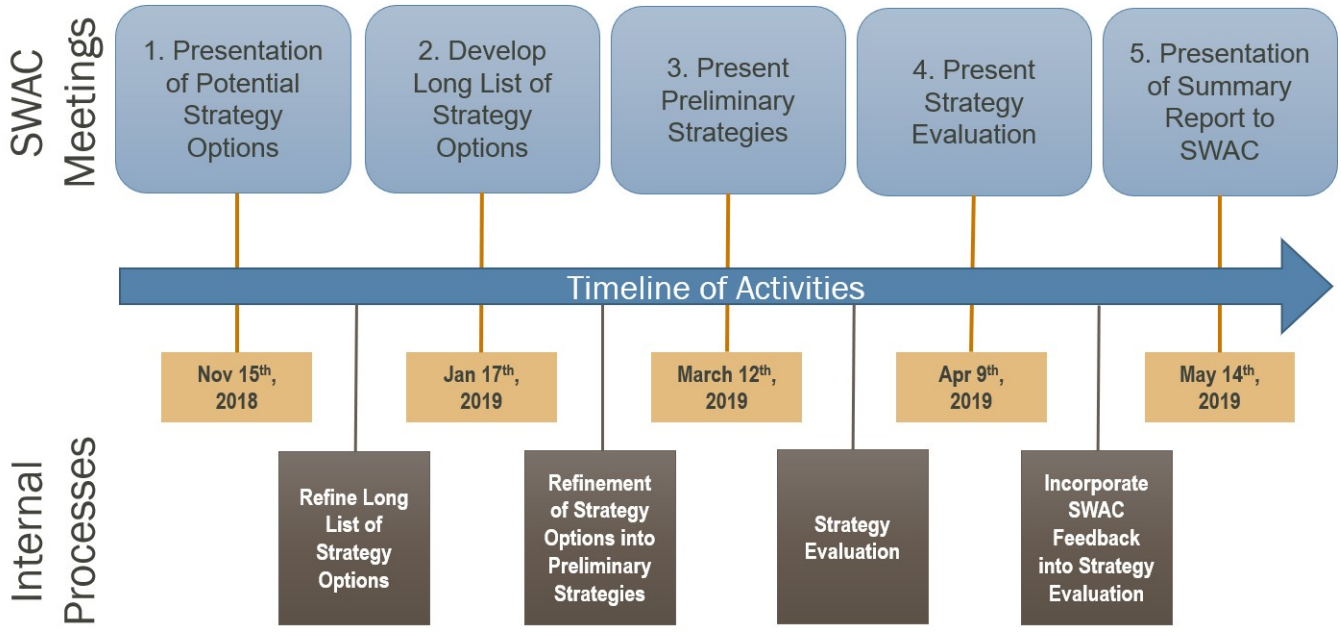


Figure 1: Timeline of SWMP Revision Process
(From Strategy Options to Strategies: Review, Evaluate and Select)

Tetra Tech Canada Inc.
Suite 1000 – 10th Floor, 885 Dunsmuir Street
Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

The Strategy Evaluation presented in this tech memo forms a basis for discussion for the April 9, 2019 SWAC meeting. At this meeting, the SWAC will be asked to provide input on the Strategy Evaluation. After this meeting, Tetra Tech will work with the CRD to further refine the Evaluated Strategies. A Summary Report will be presented at the SWAC Meeting on May 14, 2019.

2.0 EVALUATION PROCESS

The objectives of the Evaluation Process is:

1. **Gather SWAC feedback on the Preliminary Strategies and Associated Actions** (completed at March 12 SWAC Meeting)**.**
2. **Assess the Strategies according to the Evaluation Criteria.** The evaluation criteria used were Technical Feasibility and Effectiveness, Environmental Impact and Benefits, Social Impact and Effect on Waste Disposal.
3. **Determine high-level cost considerations and resource requirements for each strategy.**
4. **Identify how strategies would be implemented according to the CRD's resources over the next 10 years.**
5. **Create disposal targets.**

Figure 2 outlines the proposed evaluation process.

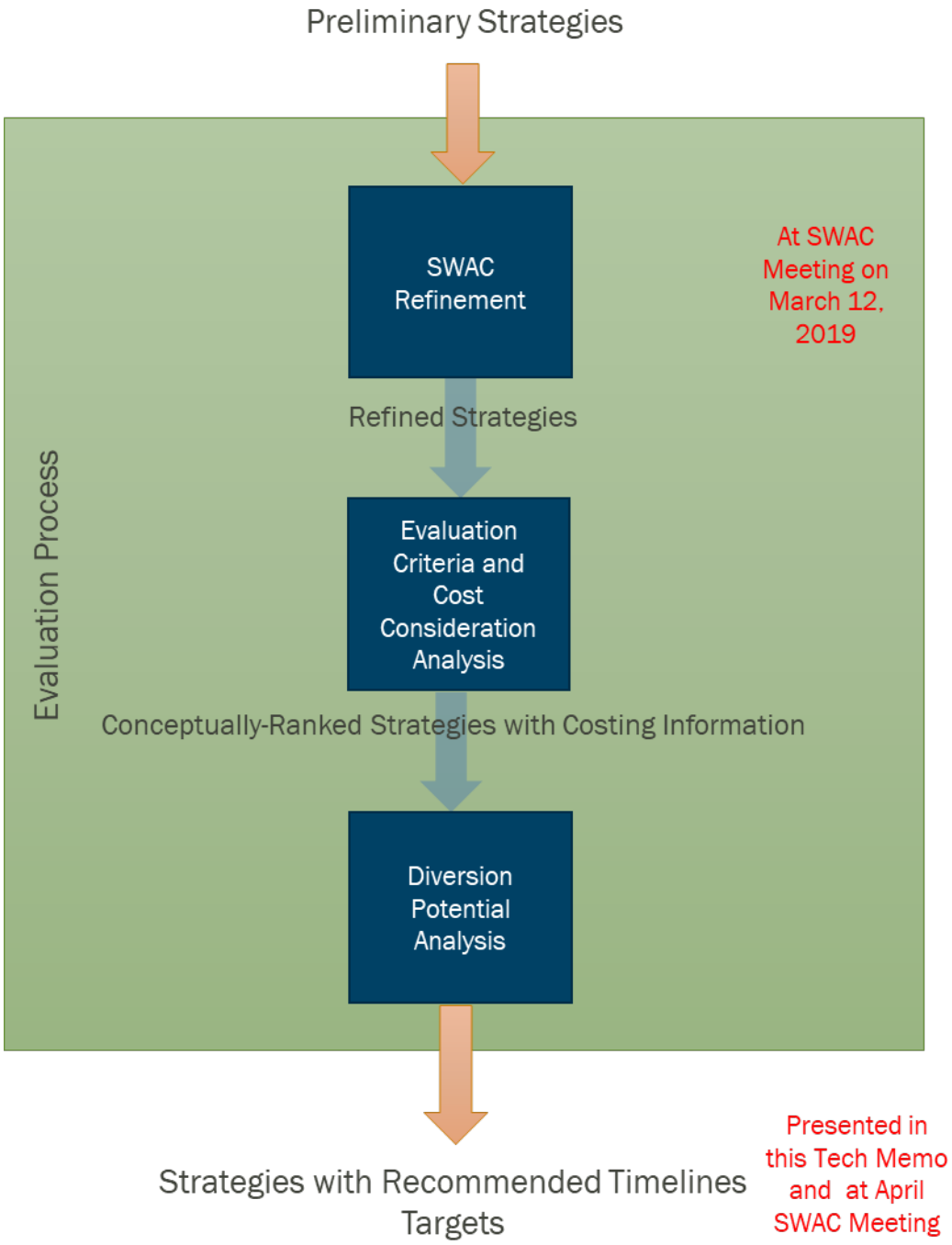


Figure 2: Evaluation Process Flow Diagram

3.0 REFINED STRATEGIES

Preliminary strategies were presented at the March 12, 2019 SWAC Meeting. SWAC Feedback (as presented in Appendix A) was gathered to refine the strategies, which are presented in this section.

3.1 Refined Strategies Summary

A summary of the refined strategies are summarized on Figure 3.

Strategies

Reduction and Reuse	Recycling	Recovery and Residuals Management
1. Continue and Enhance Education Programs 2. Encourage Waste Prevention 3. Support Reduction of Avoidable Food Waste 4. Support Reuse Activities in the Region 5. Support Local Governments in Working Towards Zero Waste and a Circular Economy 6. Continue and Enhance Policy Development	7. Increase Residential Diversion 8. Increase Multi-Family Diversion 9. Increase ICI Diversion 10. Support Existing and New EPR Programs 11. Increase Organics Diversion and Processing Capacity 12. Increase Construction, Renovation, and Demolition (CR&D) Material Diversion 13. Encourage Proper Public Space Waste Management Activities	14. Optimize Landfill Gas Management 15. Enhance Hartland Disposal Capacity

Each strategy has embedded Actions. Actions are further detailed in this Tech Memo.

Figure 3: Goals and Refined Strategies

3.2 Detailed Refined Strategies with Actions

After the March 12 SWAC Meeting, SWAC Feedback was incorporated to refine the strategies. The resulting refined strategies are presented in this section. Note that **'Strategies'** are numbered and shown in bold, **'Actions'** are denoted by a, b, c, etc. and are not bolded.

Strategies are grouped by Reduction and Reuse (Section 3.2.1), Recycling (Section 3.2.2), and Recovery and Residuals Management (Section 3.2.3), as recommended in the Guide to Solid Waste Management Planning.

3.2.1 Reduction and Reuse

1. **Continue and Enhance Education Programs.**

    A. Ensure ongoing, up-to-date promotion and education resources to enable effective participation in CRD programs and initiatives.

    B. Incorporate behaviour change components wherever possible (e.g., community-based social marketing); using a variety of education and communication strategies and tools, including digital marketing tools (e.g., social media).

    C. Expand education programs to MF and ICI sector.

    D. Enhance K-12 school program to include concepts of circular economy.

    E. Collaborate with stakeholders on education campaigns, (e.g. local governments, product stewards).

    F. Continue supporting environmental stewardship recognition.

    G. Continue to engage residents on solid waste matters; using the appropriate level of consultation.

2. **Encourage Waste Prevention**

    A. Promote less consumption and advocate for consumer responsibility.

    B. Establish a community-based waste reduction grant program (could include food waste prevention projects).

    C. Support single-use item reduction efforts.

    D. Promote sustainable and/or packaging-free purchasing options.

    E. Advocate provincially and federally to limit or eliminate the manufacturing, distribution or sale of single use items and non-recyclable materials.

    F. Advocate provincially and federally for sustainable product design (e.g., standardized packaging that is reusable, recyclable, or compostable).

3. **Support Reduction of Avoidable Food Waste**

    A. Support residential food waste reduction, for example, by continuing Love Food Hate Waste Canada program.

    B. Support ICI food waste reduction, for example, by encouraging stores to donate edible food.

    C. Continue to support food recovery organizations.

    D. Advocate for regulation to clarify use-by versus Best Before dates and educate accordingly.

4. **Support Reuse Activities in the Region.**

    A. Continue to provide funding to non-profits to help offset garbage tipping fees for unusable donated items.

    B. Continue to support and promote donations to reuse establishments.

    C. Support reuse, renting and sharing programs, such as tool libraries, repair cafes, and sewing hubs, and other materials exchange activities.

    D. Investigate free store at Hartland landfill or other facilities.

5. **Support Local Governments in Working Towards Zero Waste and a Circular Economy.**

    A. Develop model language for bylaws, best practices, OCPs, and Economic Development strategies for use by local governments using research and collaboration to guide this process.

    B. Work with local governments to identify the need for solid waste facilities and zoning for waste management activities.

    C. Use policy tools to enable local recycling infrastructure.

    D. Investigate ‘Pay-As-You-Throw’ principles to use as tools to incent less waste disposal.

    E. Investigate use of clear bags for garbage or recyclables collection to encourage proper recycling of materials, where practicable and enforceable (e.g. at events).

6. **Continue and Enhance Policy Development.**

    A. Develop model procurement policies for use by local governments, non-profits, etc.

    B. Continue to expand material bans when viable alternatives exist.

    C. Investigate licensing waste management facilities in the region to encourage transparency, consistency, and a requirement that all facilities protect public health and the environment.

    D. Investigate regulatory mechanisms to manage municipal solid waste and recyclable materials in the region.

    E. Investigate options for debris from extreme weather such as community chipping days or special burning allowances in electoral areas.

3.2.2 Recycling

7. Increase Residential Diversion.

A. Continue to promote diversion of recyclable materials (including organics).

B. Collaborate with municipal and private sector service providers to support depot diversion efforts in the region for non-curbside materials.

C. Encourage local processing and markets for recyclables.

D. Develop tools, such as a guide, to support event recycling.

8. Increase Multi-Family Diversion.

A. Allocate resources to support MF recycling, for example, by developing standardized education materials.

B. Work with local governments and private sector service providers to develop waste source separation requirements.

C. Develop policy guide for recycling, composting and garbage space and access in multi-family developments.

D. Collaborate with stakeholders (e.g., private haulers who service MF buildings or MF property managers) to implement support for MF recycling, such as a 'Train-the-Trainer' Program.

9. Increase ICI Diversion.

A. Allocate resources to increase ICI diversion, for example, a business waste reduction liaison.

B. Advocate to expand the packaging and paper product EPR program to the ICI sector.

C. Create a business waste reduction toolkit, including education about how to apply Circular Economy principles.

D. Encourage municipalities to require waste management plans with business licenses.

E. Develop policy guide for ICI space and access requirements.

F. Work with local governments and private sector service providers to develop ICI waste source separation requirements.

G. Investigate shifting disposal ban enforcement to generator, rather than hauler.

10. Support Existing and New EPR Programs.

A. Advocate to the province to expand EPR programs.

Note: The Province is currently conducting an EPR gap analysis and considering adding new materials.

B. Collaborate with stewards to increase consumer awareness about EPR programs.

C. Advocate for increased return-to-retailer opportunities.

D. Advocate federally to standardize EPR programs across Canada.

11. Increase Organics Diversion and Processing Capacity.

A. Continue to promote organics waste diversion.

B. Investigate developing a resilient local organics processing infrastructure.

Note: The CRD Board has directed staff to issue a RFEOI for an in-region or near-region organics processing facility.

C. Support compost markets by purchasing back materials.

D. Collaborate with service providers and users (e.g., local businesses) to develop guidelines for use of compostable products and packaging.

12. Increase Construction, Renovation and Demolition (CR&D) Material Diversion.

A. Develop a comprehensive CR&D strategy, including characterization of materials, best practices, and pilot projects.

B. Develop educational tools to support CR&D material diversion, e.g., create an industry toolkit, a deconstruction guide, and/or guidelines for diverting and utilizing reused materials.

C. Promote green building standards.

D. Continue collaboration with local governments to develop and use policy tools (e.g., construction permits, building codes) to maximize diversion and to align management plans.

E. Investigate beneficial uses of CR&D waste, including a clean wood waste ban.

F. Investigate banning or surcharging mixed CR&D loads at the landfill to encourage source separation.

G. Further develop programs for managing hazardous materials, like asbestos.

13. Encourage Proper Public Space Waste Management Activities.

A. Develop educational materials to prevent and reduce litter and abandoned materials in our neighbourhoods and public spaces.

B. Continue promoting alternatives to abandoned materials and illegal dumping by educating about proper management and disposal

C. Collaborate with stakeholders, including local governments and private sector facilities, to develop a regional approach to illegal dumping.

D. Investigate developing regionally-aligned bylaws.

E. Develop and pilot methodologies to 'observe, record, and report' on abandoned materials and illegal dumping incidents throughout the CRD.

F. Investigate options for large bulky item disposal, e.g., free drop-off days or large item pick-up days

3.2.3 Recovery & Residuals Management

14. Optimize Landfill Gas Management.

A. Continue to capture landfill gas for beneficial use.

Note: The CRD Board has directed staff to investigate landfill gas utilization options.

B. Investigate collaboration opportunities with educational institutions to research new beneficial uses and technologies.

15. Enhance Hartland Disposal Capacity.

A. Review ban enforcement levels, subject to recycling market conditions.

B. Continue to operate Hartland landfill using best practices.

C. Develop design options to maximize disposal capacity until 2100 and beyond.

Note: A new fill plan is in development. Design and aggregate management options could extend landfill life significantly.

D. Continue to conduct research and investigate emerging technologies.

4.0 STRATEGIES EVALUATION

Between the March 12 SWAC Meeting and the April 9 SWAC Meeting, strategies were evaluated. Notably, only strategies pertaining to Reduction, Reuse, and Recycling have been evaluated. Strategies pertaining to Recovery and Resource Management are currently on hold because of significant investigations into landfill gas usage and a new fill plan at Hartland Landfill.

4.1 Evaluation Summary

This section provides a brief description and total score for each strategy, presented in Table 4-1. Notably, all strategies have scored higher than 10 (out of a possible 20 points). Cost considerations have been provided in the table; these are rough estimates for the purpose of discussion.

Table 4-1: Evaluation Summary

Strategy #	Strategy	Score	Summarized Evaluation	Cost Considerations
1	**Continue and Enhance Education Programs**	16	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ Though this strategy has low diversion potential, this strategy is a priority to ensure effective participation the CRD waste management system.	▪ $100,000 annually to enhance education programs. ▪ Additional funding may be required for special campaigns, initiatives, and/or consultation (e.g. new bans).
2	**Encourage Waste Prevention**	12	▪ Implementation of this strategy will have considerable social impacts. ▪ This strategy is at the top of the pollution prevention hierarchy and may work to create culture and systems change that may ultimately reduce disposal in the CRD.	▪ $50,000 annual grant allocation ▪ Minimal to moderate staff time for all years.
3	**Support Reduction of Avoidable Food Waste**	16	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ This strategy would have medium environmental impact and benefits, since edible food currently makes up 12% of the material disposed at Hartland.	▪ Minimal to moderate staff time for all years. ▪ Funding may be required to continue Love Food Hate Waste program (or similar initiative).
4	**Support Reuse Activities in the Region**	16	▪ This strategy is expected to have only a small impact on disposal but may work to create culture and systems change that may ultimately reduce disposal in the CRD.	▪ Minimal to moderate staff time for all years.
5	**Support Local Governments in Working Towards Zero Waste and a Circular Economy**	12	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ This strategy does not have a directly associated impact on disposal, however, they contribute to creating a culture and systems change that may ultimately reduce disposal in the CRD.	▪ Minimal to moderate staff time for all years.
6	**Continue and Enhance Policy Development**	12	▪ Implementation of this strategy is feasible. ▪ The main environmental and disposal impact associated with this strategy is the potential for material disposal bans.	▪ May require significant funding if CRD pursues licensing or regulatory mechanisms, including funding for consultation.
7	**Increase Residential Diversion**	12	▪ Implementing this strategy and improving local recycling markets can enhance long-term stability and resiliency of recycling programs.	▪ $25,000 annually to support depot diversion efforts. Evaluate effectiveness after two years.
8	**Increase Multi-Family Diversion**	16	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ The multi-family sector contributes 13% to the total material disposed at Hartland; this strategy would likely have the potential for a moderate effect on the CRD disposal rate.	▪ $50,000 annually for education and to implement actions.
9	**Increase ICI Diversion**	18	▪ Implementation of this strategy is feasible. ▪ The ICI sector contributes 41% to the total material disposed at Hartland; this strategy has the potential for a considerable effect on the CRD disposal rate.	▪ $50,000 annually for education and to implement actions.
10	**Support Existing and New EPR Programs**	14	▪ Implementation of this strategy is feasible. ▪ If the province implements additional EPR programs this could reduce the CRD's disposal rate significantly.	▪ Funding may be required to educate the public if new disposal bans for EPR materials take effect at Hartland landfill.
11	**Increase Organics Diversion and Processing Capacity**	20	▪ Implementation of this strategy is feasible and will have considerable social impacts. ▪ 27% of the material disposed at Hartland is organic materials; this strategy may have a modest impact on reducing the quantity of organic material disposed.	▪ Additional required costs will be determined through the RFEOI process. ▪ Funding may be required to educate about use of compostable products and packaging.
12	**Increase Construction, Renovation and Demolition (CR&D) Material Diversion**	18	▪ Implementation of this strategy is feasible. ▪ All actions in this strategy support the goal to decrease the CRD's overall disposal. If a disposal ban was implemented as a result of this strategy, this could have a significant impact on the CRD's disposal rate.	▪ $50,000 annually for two years. ▪ Additional funding may be required to investigate beneficial uses of CR&D waste and banning or surcharging mixed CR&D loads at the landfill.
13	**Encourage Proper Public Space Waste Management Activities**	12	▪ Implementation of this strategy is feasible. ▪ This strategy strives to reduce abandoned waste and illegal dumping, which are important social issues	▪ $20,000 for annual illegal dumping campaign for two years; evaluate effectiveness after two years.

4.2 Recommended Targets

Based on the prioritization of strategies, Tetra Tech completed a diversion potential analysis of materials that could be removed from the waste stream in the short, medium, and long-term.

In the short-term, the focus will be the CR&D sector and organic materials. Also in the short-term, programs for single-family, multi-family, and ICI diversion will be implemented. Most of these programs are education programs, so they are expected to take several years before resulting in diversion. **The resulting diversion potential in the short-term is expected to be mostly due to a reduced tonnage of CR&D materials, and organic materials in the single-family, multi-family, and ICI sectors.**

In the medium-term, the focus will be on continuing and improving the single-family, multi-family, and ICI programs. These programs (which will begin implementation in the short-term) are expected to begin to show results by this timeframe. CR&D sector programs and organic materials diversion programs will be continued. **The improved diversion potential in the medium-term is expected to be mostly due to reduced tonnage of single-family, multi-family, and ICI sector recyclable materials. Diversion levels for organic materials are also expected to further improve in these sectors.**

In the long-term, all programs will be refined, resulting in increased diversion in all sectors. Additionally, new EPR programs may be implemented in this timeframe. **The improved diversion potential in the long-term is expected to be due to slight improvement in all sectors due to program refinement, and a reduced tonnage of printed paper and packaging programs from the ICI sector, and a reduced tonnage of textiles from all sectors.**

The current (2018) disposal in the CRD is 380 kg/capita. The BC Ministry of Environment and Climate Change (Ministry) has set a target for the province of 350 kg/capita by 2020. One of the SWMP goals is to surpass this 350 kg/capita target.

The diversion potential analysis in included in Appendix C. The resulting suggested disposal targets are presented in Table 4-2.

Table 4-2: Recommended Targets

	Short-Term Goal (3 years)	Medium-Term Goal (5 years)	Long-Term Aspirational Goal (10+ years)
Targeted Sectors	▪ Construction, Renovation, and Demolition	▪ Single-family ▪ Multi-family ▪ ICI	▪ Refine programs to increase performance for all sectors
Disposal Target (kg per capita)	**340[1]**	**285**	**250[2]**

[1]This target is aggressive and assumes that disposal bans for CR&D materials would be implemented.
[2]This target is aggressive and assumes that new EPR programs will be implemented by the Ministry in the long-term timeframe.

Pending SWAC feedback at the April 9 SWAC meeting, a more detailed implementation schedule will be prepared and included in the summary report.

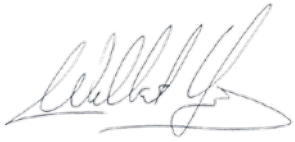
5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Capitol Regional District and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the Capitol Regional District, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

6.0 CLOSURE

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

Respectfully submitted,
Tetra Tech Canada Inc.



Prepared by:
Melissa Nielsen, E.I.T.
Project Engineer-in-Training
Solid Waste Management Practice
Direct Line: 604.608.8638
Melissa.Nielsen@tetratech.com

Reviewed by:
Wilbert Yang, P.Eng.
Senior Planning Engineer
Solid Waste Management Practice
Direct Line: 604.608.8648
Wilbert.Yang@tetratech.com

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APPENDIX A

MARCH 12, 2019 SOLID WASTE ADVISORY COMMITTEE – FLIPCHART EXERCISE

March 12, 2019 Solid Waste Advisory Committee – Flipchart Exercise

Reduction and Reuse: Anke Bergner

1. Combine C & D: Expand education programs to MF and ICI sector. Enhance K-12 school program to include concepts of circular economy.

    - Identify goals and measures to evaluate

    Promote less consumption and advocate for consumer responsibility under waste prevention – omit it's under general education

2. Support single use item reduction efforts ~~such as plastic bag bans~~

3. Support **avoidable** food waste reduction

Strategy 1 – Continue and Enhance Education Programs

- Front line staff play an important role in educating residents
- Visuals are very helpful, for example, on receptacles
- Explain "why" we should be diverting
- Provide feedback on what happens to materials after you put them in the recycling bins
- Extend the school program to higher educational institutions; don't limit to K-12
- Provide benchmarks and set targets. Targets should be set high and allow for comparison over time.
- Expand education programs to include management of CR&D materials
- Garbage/recycling is changing. For example, internet business creates more cardboard and Styrofoam.

Strategies 2 & 3 – Encourage Waste Prevention & Support Food Waste Reduction

- Extend community grant program include projects by university students
- Expand bans to include other plastic items, like plastic straws
- There is confusion about best before dates. We need regulation to help guide the consumer.

Strategy 4 – Support Reuse Activities in the Region

- Support for sharing/renting initiatives
- There are some successes in small communities with "lawning" items – putting gently used items out on the front lawn for others to use.
- Organized swap days may also work
- CRD can help educate the public about what reuse organizations exist and what they do

Strategy 5 – Support Local Governments in Working Towards Zero Waste and a Circular Economy

- CRD strategies should align with municipal strategies so that they complement each other, not duplicate
- Encourage municipalities to use real user pay like Pay As You Throw (PAYT)
- Clear garbage bags can play a role in reducing hazardous materials or recyclables in the garbage

Strategy 6 – Continue and Enhance Policy Development

- Expand procurement policies to ICI sector, not just for government
- All facilities in UK are licensed. This creates transparency and consistency, protects public health and the environment and levels the playing field
- Need clarity on what 'investigating open burning restrictions' means. Burning is a thing of the past. Community chipping days may be a solution to deal with fallen trees and debris from extreme weather events.

Reduction and Reuse: Melanie Tromp-Hoover

**make no mention of modern tech tools (i.e. social media)

1A: What does adequate mean? What is the measure? How do you benchmark?

March 12, 2019 Solid Waste Advisory Committee – Flipchart Exercise

1B: Behavioural psychology lens is important to highlight in this strategy

1D: Wishcycling – too specific to call out in a strategy? Should this be more general?

1G: Apply as overarching philosophy (use it elsewhere too)

Missing:

- what have other jurisdictions done? Gaps? So we are not reinventing just for our own region.
- Insights onto citizen views on reduction and reuse -survey?
- Survey data will give us a sense of people's attitudes and abilities to engage in education
- Potential to create guides for reduce/reuse like recycling

2: most important: educate consumer on producers

2B:

- education wording issue – ban vs efforts
- Encourage multiple use items (eg bags)
- Bans are regulatory
- Support reusable use of materials and products

2D: education

** reuse and repurpose are different

Transition economy to…

3: support AVOIDABLE food waste reduction

3D: element of education here too

4: support reuse activities in region

4B: add 'repurposing' establishments

4C, D & E: combine all three – develop and support infrastructure to ensure materials remain in use

4F: apply in individual munis? Multimedia platforms to show what is available and where

5: local governments – zero waste

**with respect to reduce and reuse efforts

5A&B: research and collaboration to guide this process

5F: emphasis on enforcement? What about no bag?

**benefit of knowing what works elsewhere?

Recycling – Tom Watkins

7:

- Suggest that the CRD "selectivity" promote diversion (of most viable materials)
- CRD munis set up transfer stations for depot recycling. Private depots have difficulty with costs and zoning
- Focus on 1 or 2 key recyclables to encourage local market development
- Economies of scale possible through working together to develop local markets
- Work with neighbouring regional districts and municipalities

8:

March 12, 2019 Solid Waste Advisory Committee – Flipchart Exercise

- Work with property management companies to facilitate recycling programs
- Establish Train the trainer programs to promote recycling
- Provide info on where to get signage/bins/service
- Supply new tenant information kits
- Set minimum service levels

9:

- Enforce bans at source, not hauler

11:

- More promotion/education to help food waste diversion

Other:

- Focus on more education and regulation
- More C&D waste diversion needed
- Establish C&D operation at Hartland to divert more of these materials

Recycling – Wendy Dunn

7: Increase Residential Diversion

Move 'Develop a guide to support event recycling' to a new strategy called 'Enhance public space waste management activity

8: Increase Multi-family Diversion

Add 'Establish a waste reduction community grant program' (Note already identified in 2a)

New - 12: Enhance public space waste management activity

- Develop guide to support event recycling
- Also include streetscape, illegal dumping/abandoned waste and parks

New - 13: Increase diversion of CR&D material: clean wood, windows, building code, permits

Note – also include:

- Education in all recycling strategies
- Advocating for standardized packaging: either reusable, recyclable or compostable

APPENDIX B

STRATEGY EVALUATION

1.0 REDUCTION AND REUSE

B-1: Strategy Evaluation - 1. Continue and Enhance Education Programs

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
1. Continue and Enhance Education Programs A. Ensure ongoing, up-to-date promotion and education resources to enable effective participation in CRD programs and initiatives. B. Incorporate behaviour change components wherever possible (e.g., community-based social marketing); using a variety of education and communication strategies and tools, including digital marketing tools (e.g., social media). C. Expand education programs to MF and ICI sector. D. Enhance K-12 school program to include concepts of circular economy. E. Collaborate with stakeholders on education campaigns, e.g. local governments, product stewards. F. Continue supporting environmental stewardship recognition. G. Continue to engage residents on solid waste matters; using the appropriate level of consultation.	▪ **Action 1A** is in accordance with current practice and should be simple to implement and maintain. Consistent messaging throughout the CRD will aid in public understanding and use of diversion services throughout the community and support the goal of having informed citizens that participate effectively in proper waste management practices. ▪ **Action 1B** will use techniques such as Community-based social marketing (CBSM). CBSM is an approach to program promotion and education that encourages high rates of effective participation and long-term behavior change. The CBSM process centres on uncovering barriers that inhibit individuals from engaging in sustainable behaviours, identifying tools that have been effective in fostering and maintaining behaviour change, then piloting takes place on a small portion of the community followed by ongoing evaluation once the program has been implemented community-wide. ▪ A significant bank of resources exist (within and beyond British Columbia) of sample education materials and guides for rolling out educational programs for different sectors, which could be used as a foundation for **Action 1C**. Initiating education programs for MF and ICI sectors now sets the CRD up for success when rolling out additional diversion programming or making changes to existing programs. ▪ Educating youth (**Action 1D**) is a critical key to long-term behaviour change in recycling[1,2]. It influences not just recycling habits at home but builds a foundation for youth to develop positive diversion habits to continue throughout life. A myriad of resources exist on integrating zero waste education for youth which the K-12 could consider adapting for the K-12 program[3] ▪ Interested stakeholders exist throughout the CRD (e.g., universities, local governments, and private sector service providers) who are open to collaboration (**Action 1E**); this collaboration may bolster the success of education programs. ▪ **Actions 1F through 1G** are in accordance with current practice and should be simple to implement and maintain.	▪ **Actions 1A through 1H** are expected to enhance rates of participation, though little environmental impact is anticipated as a *direct* result of these initiatives. Additional material capture and participation is typically attributed to emerging/improving collection and diversion programs, thus direct impact is hard to measure. This strategy contributes to creating culture and systems change that may ultimately reduce disposal in the CRD. ▪ This strategy is a priority to ensure effective participation the CRD waste management system.	▪ **Actions 1A through 1H** will increase overall engagement with waste management systems in the CRD. They may result in an overall growth in the waste reduction movement ▪ Confusion among residents can be often widespread in diversion programs, leading to general frustration among the public (i.e., “Why is recycling so confusing?”) Receiving information and active engagement through CRD programs (**Actions 1A through 1H**) may improve public perception. ▪ Collaborating with stakeholders (**Action 1E)** may result not only in improved education programs but also improved relationships with all stakeholders interested in waste management, thus creating a more resilient waste management system in the CRD. Furthermore, collaborating with local governments on education programs would likely result in consistent messaging and more harmony between initiatives within the CRD.	▪ This strategy may have a moderate direct impact on disposal capacity. ▪ This strategy contributes to creating culture and systems change that may ultimately reduce disposal in the CRD.	**16**	▪ $100,000 annually to enhance education programs. ▪ Additional funding may be required for special campaigns, initiatives, and/or consultation (e.g. new bans).
Score (High- 5, Medium – 3, Low – 1)	High	Medium	High	Medium		

[1] Call 2 Recycle. Recycling is Important at Any Age. https://www.call2recycle.ca/recycling-is-important-at-any-age/
[2] City of Boroondara. Schools as gateways to community behaviour change on consumption and waste. https://www.mwrrg.vic.gov.au/assets/resource-files/Smart-school-MF-R1-Final-Report-Bo.pdf
[3] Sustainability Victoria. Waste Smart Schools: A practical ‘how to’ guide for Victorian schools, January 2016. https://www.sustainability.vic.gov.au/-/media/SV/Publications/Schools/Modules/Waste/RSS-waste-how-to-guide-PDF-version.pdf

Table B-2: Strategy Evaluation - 2. Encourage Waste Prevention

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
2. Encourage Waste Prevention A. Promote less consumption and advocate for consumer responsibility. B. Establish a community-based waste reduction grant program (could include food waste prevention projects). C. Support single-use item reduction efforts. D. Promote sustainable and/or packaging-free purchasing options. E. Advocate provincially and federally to limit or eliminate the manufacturing, distribution or sale of single use items and non-recyclable materials. F. Advocate provincially and federally for sustainable product design (e.g., standardized packaging that is reusable, recyclable, or compostable).	▪ It is recommended that **Action 2B** grant criteria for projects eligible for funding including food waste prevention and recycling initiatives. This Action complements the existing Recycle BC Community Champions funding program[4] for waste reduction initiatives in communities. ▪ Efforts similar to **Action 2C** in BC municipalities (e.g., City of Victoria, City of Vancouver) have proven successful at increasing engagement. ▪ Sustainable and/or packaging-free purchasing options (**Action 2D**) have gained popularity in recent years. One Zero Waste grocery store exists in Victoria and others exist throughout BC. These types of stores mainly reach 'early adopters' – that is, environmentally-minded individuals who care and think deeply about waste. ▪ **Actions 2E and 2F** tackle issues that are outside of the CRD's jurisdiction. Advocating provincially and federally about these issues is currently the most feasible way to address them.	▪ Strategy 2 is at the top of the pollution prevention hierarchy as it deals with reduction, therefore, it has potential for environmental impacts. Waste *reduction* (as opposed to recycling) results in reduced embodied energy for materials that were not created in the first place (or were created in a less wasteful way).	▪ The intention of **Action 2A** creates widespread understanding of the importance of reducing waste at the top of the pollution prevention hierarchy. This understanding is positive as it empowers residents to make positive and impactful choices about the way that they consume. ▪ **Actions 2B, 2C, and 2D** engage with early adopters of the zero-waste movement and have the potential to create a strong community. ▪ **Action 2B** provides mechanism for the community to act on its own initiatives / take ownership for improvements in reduction. ▪ **Action 2C** directly engages with something that is highly visible and many residents feel strongly about. ▪ **Action 2D** supports organizations that have the potential to create a widespread community of residents who care deeply about zero waste. This is already happening in the CRD at the Zero Waste Emporium in the City of Victoria, where waste reduction events are hosted. Another excellent example of how these businesses can create community is Nada[5] in Vancouver, BC, a zero-waste grocery store which additionally functions as a hub for the zero-waste community in Vancouver and hosts regular events including zero waste cooking workshops and monthly meetups for interested individuals. ▪ **Actions 2E and 2F** indirectly have the potential to address residents' 'Recycling is confusing' complaints by simplifying product design and ensuring materials are clearly recyclable, compostable, or reusable. However, because this can only be done through advocacy, this positive social impact will likely not be realized in the near future.	▪ **Action 2C** (and, to a small extent, **2D**) have some potential to reduce waste disposal. ▪ Other Actions (**2A, 2B, 2E, and 2F)** are not expected to have a direct impact on waste disposal but work to create culture and systems change that may ultimately reduce disposal in the CRD.	**12**	▪ The CRD has initially proposed that the total grant funding for **Action 2B** would be $50,000. ▪ In general, Strategy 2 is in line with current practice, therefore new resources required would be minimal to moderate.
Score (High- 5, Medium – 3, Low – 1)	Medium	Medium	High	Low		

[4] Recycle BC. Community Champions. https://recyclebc.ca/education/commununity/community-champions/
[5] https://www.nadagrocery.com/

Table B-3: Strategy Evaluation - 3. Support Reduction of Avoidable Food Waste

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
3. Support Reduction of Avoidable Food Waste A. Support residential food waste reduction, for example, by continuing Love Food Hate Waste Canada program. B. Support ICI food waste reduction, (e.g., encouraging stores to donate edible food). C. Continue to support food recovery organizations. D. Advocate for regulation to clarify use-by versus Best Before dates and educate accordingly.	▪ Nationwide efforts exist to reduce food waste (**Actions 3A through 3D)**, especially as data on the enormous quantity of food being wasted comes into public view (recent estimates show that more than half of all food in Canada is being wasted).[6] ▪ Research has shown that avoidable household food waste can be reduced by up to 15% with an intensive Love Food Hate Waste campaign **(Action 3A)**.[7] ▪ Several Canadian retailers (e.g., Save-On Foods and Walmart) have committed to reducing food waste and partners may exist (e.g., FoodMesh Food Recovery Program[8]) to catalyze food waste reduction in the ICI sector **(Action 3B and 3C)**. ▪ Research has shown that restaurants can save up to $7 in operating costs for every $1 invested to reduce kitchen food waste, thus providing a powerful incentive to build upon **(Action 3B)**.[9] ▪ The National Zero Waste Council, a leadership initiative advocating for waste prevention in Canada, advocates regulating for clarity around Best Before dates. Date labelling guidance exists from organizations such as ReFed in the US and WRAP in the UK **(Action 3D)**.[10]	▪ Wasted food embodies significant amounts of wasted resources (energy, water, etc.) that were required to grow, produce, and distribute that food. Reducing the amount of food wasted by one tonne has the equivalent effect on CO_2 emissions as taking one car off the road for a year **(Actions 3A through 3D)**.[13] ▪ According to 2016 waste composition results, 12% of the material disposed at Hartland is edible food waste.[11] Food waste disposed in landfills is a significant source of greenhouse gas emissions. However, much of the landfill gas is currently captured (68% in 2018)[12] and turned into electricity or flared, and the landfill gas system may be upgraded, which would likely increase the capture rate **(Actions 3A through 3D)**.	▪ Residents directly benefit financially when they reduce food waste. Estimates of money spent on wasted food per household in Canada range from $1,100[13] to nearly $1,800[6] annually. **Action 3A** directly encourages residents to waste less food, thereby encouraging consumer savings in their food budgets. Strategy 3d may indirectly result in cost savings to residents, as residents will waste less food and money if they understand when an item is truly no longer edible. ▪ Local non-profits benefit twofold from this strategy: **Action 3B** encourages local businesses to donate edible food, which results in an influx of food to local charities. **Action 3C** supports food recovery organizations in the region directly.	▪ Edible food waste makes up a large proportion of the materials disposed at Hartland (12%)[11]. One study demonstrated that an intensive Love Food Hate Waste campaign reduced household food waste by up to 15%. With **Action 3A**, similar results in the CRD (a 'best-case scenario') could yield a disposal reduction of approximately 1,400 tonnes (a 1% reduction). ▪ ICI food waste reduction **(Action 3B)** could have a more significant impact on tonnage: each year, the ICI sector disposes of over 9,000 tonnes of edible food.	**16**	▪ This strategy requires minimal additional funding due to actions that will require additional staff time. ▪ Funding may be required to continue Love Food Hate Waste program (or similar initiative).
Score (High- 5, Medium – 3, Low – 1)	High	Medium	High	Medium		

[6] Second Harvest, 2019 (https://secondharvest.ca/wp-content/uploads/2019/01/Avoidable-Crisis-of-Food-Waste-The-Roadmap-by-Second-Harvest-and-VCMI.pdf)
[7] WRAP UK, 2012 (http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf)
[8] Food Mesh (https://foodmesh.ca/)
[9] Champions 12.3 (https://champions123.org/wp-content/uploads/2019/02/Report_The-Business-Case-for-Reducing-Food-Loss-and-Waste_Restaurants.pdf)
[10] National Zero Waste Council, 2018 (http://www.nzwc.ca/focus/food/national-food-waste-strategy/Documents/NZWC-FoodLossWasteStrategy.pdf)
[11] Capital Regional District, 2016 (https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/WasteCompositionStudy2016.pdf?sfvrsn=4)
[12] Maura Walker and Associates, Capital Regional District Solid Waste Management Plan Existing Solid Waste Management System, 2018.
[13] Love Food Hate Waste, 2017 (https://lovefoodhatewaste.ca/about/food-waste/)

Table B-4: Strategy Evaluation - 4. Support Reuse Activities in the Region

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
4. Support Reuse Activities in the Region A. Continue to provide funding to non-profits to help offset garbage tipping fees for unusable donated items. B. Continue to support and promote donations to reuse establishments. C. Support reuse, renting and sharing programs, such as tool libraries, repair cafes, and sewing hubs, and other materials exchange activities. D. Investigate establishing a free store at Hartland landfill or other facilities.	▪ **Actions 4A and 4B** are in accordance with current CRD practices and should be simple to implement and maintain. ▪ An existing groundswell of community reuse organizers exists, which the CRD can build on with **Actions 4C**. ▪ Free Stores (**Action 4D**) can be a successful and low-cost model to raise awareness of a) high value goods being disposed of and b) availability of finding 'another person's treasure' for oneself. ▪ Free Store (**Action 4D**) feasibility is dependent on availability of appropriate space, and potentially, a local organization to run the program.	▪ Strategy 4 is near the top of the pollution prevention hierarchy as it deals with reuse, therefore, it has potential for environmental impacts. Material reuse results in reduced embodied energy for materials that were not created in the first place.	▪ **Actions 4A through 4D** improve access to reused goods, which can save residents money, as they don't need to purchase new materials. Furthermore, promotion of reuse organizations may improve social acceptability of reusing items, which is a positive social impact as residents become aware of costs savings that could be realized and the environmental benefits of buying used materials. ▪ **Actions 4A through 4C** build trust and deepen relationships with organizations essential for exchange of reused materials. Promotion of these programs is a key part of the Strategy's success. ▪ Renting and sharing programs **(Action 4D)** have the potential to become community hubs for environmentally-minded individuals. The Victoria Tool Library is an existing example of this. By supporting these initiatives, the CRD will be supporting the waste reduction community.	▪ This strategy is expected to have only a small (and nearly impossible to measure) impact on disposal but work to create culture and systems change that may ultimately reduce disposal in the CRD. ▪ **Action 4D** will enable a small reduction in disposal by encouraging reuse of materials at Hartland.	**16**	▪ **Actions 4A through 4C** do not require any additional new funding.
Score (High- 5, Medium – 3, Low – 1)	High	Medium	High	Medium		

Table B-5: Strategy Evaluation - 5. Support Local Governments in Working Towards Zero Waste and a Circular Economy

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
5. Support Local Governments in Working Towards Zero Waste and a Circular Economy A. Develop model language for bylaws, best practices, OCPs, and Economic Development strategies for use by municipalities and electoral areas using research and collaboration to guide this process. B. Work with municipalities and electoral areas to identify the need for solid waste facilities and zoning for waste management activities. C. Use policy tools to enable local recycling infrastructure. D. Investigate 'Pay-As-You-Throw' principles to use as tools to incent less waste disposal. E. Investigate use of clear bags for garbage or recyclables collection to encourage proper recycling of materials, where practicable and enforceable (e.g. at events).	▪ Local governments in the CRD value waste reduction and would likely be open to support from the CRD in language for bylaws, best practices, OCPs, and Economic Development strategies (**Action 5A and 5B**). ▪ Disposal bans for material categories that have processing opportunities and markets can be effective to enable local recycling infrastructure (**Action 5C**). ▪ **Action 5D** would require a study by the CRD to help municipalities understand concepts of 'Pay-As-You-Throw' (PAYT) and approaches that they could incorporate into their municipal waste collection systems. Local governments typically administer waste collection. Municipalities with collection in the CRD already have a 'User Pay' system which limits the number of containers at the curb. Residents have to purchase tags to put out additional bags. This Action would involve investigating weight-based and/or frequency-based approaches. ▪ **Action 5E** would require a study to investigate an approach for using clear bags to improve diversion rates. This has been implemented in several Canadian jurisdictions (mostly in Nova Scotia and Ontario[14]) and typically relies on manual collection systems, where discarded materials are put into clear bags so that collection staff can visually inspect the contents before being placed in the collection truck. The study would help the CRD to assess whether this type of approach would be feasible for CRD municipalities to adopt.	▪ **Actions 5A through 5C** do not have directly associated environmental impacts, however, they contribute to creating a culture and systems change that may ultimately reduce disposal in the CRD. ▪ **Action 5C and 5D** could, if implemented, reduce the amount of material disposed and encourage proper diversion of materials.	▪ **Action 5A** strives to improve alignment of local governments and the CRD. This may ultimately lead to greater harmony between the local governments. Furthermore, regionally aligned programs may lead to less resident confusion, thereby supporting effective participation in CRD programs and initiatives. ▪ **Action 5C** encourages local recycling where options are available, which could in turn boost the local economy. ▪ PAYT programs (**Action 5D**) create awareness of disposal habits. These programs can save low waste generators money, thus aligning monetary incentives with waste reduction. However, these programs could lead to increased inappropriate disposal of household waste for 'free' (for example in park litter bins). However, as discussed in the 'Technical Feasibility and Effectiveness' comment for Action 5D, it is not expected that implementing PAYT for residential collection would be feasible or practical in the CRD. ▪ Use of clear bags (**Action 5E)** creates a social incentive for generators to sort waste properly.	▪ **Actions 5A through 5C** do not have directly associated impact on disposal, however, they contribute to creating a culture and systems change that may ultimately reduce disposal in the CRD. ▪ **Action 5D and 5E** will provide more information on potential effects on waste disposal that the programs described could have.	**12**	▪ **Action 5A, 5B, and 5C** are significant undertakings for a CRD staff member but would not require any capital funding.
Score (High- 5, Medium – 3, Low – 1)	High	Low	High	Low		

[14] Background Research on Clear Garbage Bag Programs Across North America, https://www.niagararegion.ca/government/committees/pdf/Quinte%20Clear%20Bag%20Report.pdf

Table B-6: Strategy Evaluation - 6. Continue and Enhance Policy Development

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
6. Continue and Enhance Policy Development A. Develop model procurement policies for use by local governments, non-profits, etc. B. Continue to expand material bans when viable alternatives exist. C. Investigate licensing waste management facilities in the region to encourage transparency, consistency, and a requirement that all facilities protect public health and the environment. D. Investigate regulatory mechanisms to manage municipal solid waste and recyclable materials in the region. E. Investigate options for extreme weather debris such as community chipping days or special burning allowances in electoral areas.	▪ Examples of procurement policies exist for many regions within BC that could be adapted for CRD use (**Action 6A**). ▪ Since the CRD has existing material bans, it should be relatively straightforward to adapt the existing process material ban procedure for any materials that are added (**Action 6B**). Waste generators in the CRD also already have familiarity with existing bans, which lends itself to greater adherence to future bans. ▪ Several regional districts in BC, including Regional District of Nanaimo and Cowichan Valley Regional District have the ability to license waste management facilities **(Action 6C)**. This action would involve the CRD studying the requirements to establish a licensing system and understanding the positive and negative impacts. ▪ **Action 6D** would involve the CRD studying regulatory tools and mechanisms to manage materials in the region. ▪ **Action 6E** would involve the CRD studying measures to deal with debris from extreme weather events.	▪ Developing model procurement policies (**Action 6A**) could indirectly decrease disposal or encourage contractors to use other more sustainable practices. A sustainable or "green" procurement policy provides guidance to employees and departments to make purchasing decisions. Through this kind of policy, the CRD can encourage policies that prioritize the reduction of consumption, use of durable goods, or choosing items with 100% recycled content. ▪ **Action 6B** would likely lead to decreased disposal and could help to manage any materials that are identified as hazardous. ▪ **Actions 6C, 6D, and 6E** would investigate possible environmental implications of the programs described.	▪ **Actions 6A and 6B** would have an underlying impact on the system but direct social impacts would not likely be present. ▪ Programs resulting from **Actions 6C, 6D, and 6E** would also not be likely to have direct social implications – these actions describe investigations, which would include investigating social implications of any programs to be implemented.	▪ **Action 6B** has the potential for significant disposal reduction, depending on which materials are banned. However, this is a high-level maintenance action that may not result in disposal bans in the near future. ▪ **Actions 6C, 6D, and 6E** would investigate waste disposal implications of the programs described.	**12**	▪ **Actions 6A and 6B** would require minimal to moderate CRD staff resources. ▪ **Actions 6C and 6D** may require significant funding if CRD pursues licensing or regulatory mechanism, including funding for consultation.
Score (High- 5, Medium – 3, Low – 1)	High	Medium	Low	Medium		

2.0 RECYCLING

Table B-7: Strategy Evaluation - 7. Increase Residential Diversion

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
7. Increase Residential Diversion A. Continue to promote diversion of recyclable materials (including organics). B. Collaborate with municipal and private sector service providers to support depot diversion efforts in the region for non-curbside materials. C. Encourage local processing and markets for recyclables. D. Develop tools, such as a guide, to support event recycling.	▪ **Action 7A through 7D** can be developed and implemented by CRD staff in partnership with local governments and other stakeholders. ▪ Local processing options (**Action 7C)** exist for some materials currently, such as concrete and asphalt, yard waste, and metal. The CRD should stay abreast of recycling opportunities for various materials in the CRD so that opportunities can be identified and promoted. ▪ The CRD staff can investigate approaches and tools such as City of Vancouver's Green Events Planning Guide[15] and the Downtown Victoria Business Association Green Events Guide[16] to assist with developing tools for the CRD (**Action 7D**).	▪ **Action 7A** creates positive environmental impacts by diverting materials from landfill. ▪ Given the increasing instability of international markets for recyclable materials, improving local recycling markets (**Action 7C**) can enhance long-term stability and resiliency of recycling programs.	▪ Overall, 38% of the waste produced in the CRD is produced by residential sources. Programs should continue to educate the residents about the materials that they discard, because these programs are far-reaching in that they make residents more generally conscientious about waste. This makes **Action 7A** important. ▪ Encouraging local markets for recyclables **Action 7C**, instead of shipping recyclables overseas, can provide a boost the local economy. ▪ Event recycling (**Action 7D**) is important because though the overall amount of materials diverted at events may not be significantly large, events are an excellent opportunity to educate the public in what materials can be recycled, which improves the strength and resiliency of residential recycling.	▪ Recyclable materials from residential sources represent 9% of the overall material disposed at Hartland Landfill. These actions, especially **Action 7A and 7B** support programs to divert recyclable materials that are disposed at Hartland Landfill. ▪ **Action 7D** may result in a small decrease in waste disposal, as events can create a significant amount of waste.	**12**	▪ **Actions 7A through 7D** would require minimal to moderate CRD staff resources. ▪ The CRD has initially proposed that the total support funding for **Action 7B** would be $25,000 annually for two years and evaluate effectiveness after two years.
Score (High- 5, Medium – 3, Low – 1)	Medium	Medium	Medium	Low		

[15] https://vancouver.ca/doing-business/greening-your-event.aspx
[16] https://downtownvictoria.ca/app/uploads/2018/07/Green-Events-Guide-final.pdf

Table B-8: Strategy Evaluation - 8. Increase Multi-Family Diversion

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
8. Increase Multi-Family Diversion A. Allocate resources to support MF recycling, for example, by developing standardized education materials. B. Work with local governments and private sector service providers to develop waste source separation requirements. C. Develop policy guide for recycling, composting and garbage space and access in multi-family developments. D. Collaborate with stakeholders (e.g., private haulers who service MF buildings or MF property managers) to implement support for MF recycling, such as a 'Train-the-Trainer' Program.	▪ Allocating additional staff to support multi-family diversion would be a start to improving MF waste diversion (**Action 8A**). This staff member could research approaches from other jurisdictions, such as the standardized educational materials for multi-family recycling exist in other nearby jurisdictions, such as Metro Vancouver.[17] ▪ Requiring source separation **(Action 8B)**, for example by developing bylaws, is feasible, as has been demonstrated by municipalities throughout BC. Municipalities in the CRD support MF diversion measures. Having the CRD work with local governments and the private sector to develop source separation requirements for the MF sector should be feasible. ▪ **Action 8C** is feasible; the CRD should consider the resources required to develop this policy guide. ▪ **Action 8D** is feasible and implementation examples exist throughout BC, including the City of Vancouver's Multi-Family Ambassador Program and the Zero Waste Coach in the City of North Vancouver.	▪ The multi-family sector disposed approximately 13% of the total materials disposed at Hartland. Of this, approximately 75% of these materials could be diverted.[18] **Actions 8A through 8D** may have a modest impact on disposal by reducing the amount disposed from the MF sector. It should be considered that the MF sector will likely grow faster than the SF sector, and therefore the quantity of materials consumed by this sector will increase.	▪ This strategy (especially **Actions 8A and 8B**) would lead to enhanced standardization across buildings and potentially municipalities, leading to improved buy-in and participation in recycling programs. Multi-family residents often report feeling 'left out' of recycling programs or are confused about what can be recycled because each building's recycling system is different. This is especially exaggerated because there tends to be a higher turnover of residents in multi-family housing than in single-family housing. This leads to frustration with the overall recycling system.	▪ **Actions 8A to 8D** would likely have the potential for a moderate effect on multi-family diversion.	**16**	▪ The CRD has initially proposed that the total allocation for **Action 8A** would be $50,000 annually for education and to implement actions.
Score (High- 5, Medium – 3, Low – 1)	High	Medium	High	Medium		

[17] http://www.metrovancouver.org/services/solid-waste/apartments-condos/apartment-recycling-toolkit/Pages/default.aspx#

Table B-9: Strategy Evaluation - 9. Increase ICI Diversion

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
9. Increase ICI Diversion A. Allocate resources to increase ICI diversion, for example, a business waste reduction liaison. B. Advocate to expand the packaging and paper product EPR program to the ICI sector. C. Create a business waste reduction toolkit, including education about how to apply Circular Economy principles. D. Encourage municipalities to require waste management plans with business licenses. E. Develop policy guide for ICI space and access requirements. F. Work with local governments and private sector service providers to develop ICI waste source separation requirements. G. Investigate shifting disposal ban enforcement to generator, rather than hauler.	▪ Allocating additional staff resources to support ICI sector diversion would be a start to improving ICI waste diversion **(Action 9A)**. This resource could also undertake **Actions 9C, 9D, and 9E.** ▪ Other regional districts have been advocating for an ICI PPP EPR program (**Action 9B**). ▪ Researching and identifying source separation approaches for ICI sector **(Action 9F)** with the intent to develop future bylaws is feasible. ▪ **Action 9G** would involve the CRD studying approaches for shifting the disposal ban enforcement to generators. It is feasible because it could be undertaken by the FTE identified 9A.	▪ The ICI sector is the largest waste-generating sector in the CRD, representing 41% of the waste disposed at Hartland. Of this, up to 74% has diversion potential. **Actions 9A through 9G** could decrease the disposal rate.	▪ **Actions 9A, 9C, 9D and 9G** may have a positive social impact, as they will create engagement between local businesses and the CRD. ▪ Shifting disposal ban enforcement to the generator (**Action 9G**) may have a negative impact on businesses who are not interested in recycling or reducing their waste.	▪ Because the ICI sector generates so much waste, this strategy has the potential to reduce waste disposal considerably. ▪ Of special note is Strategy 9B. Though the CRD does not have direct jurisdiction over an ICI PPP EPR program, if this was implemented, if could have a large impact on disposal.	**18**	▪ The CRD has initially proposed that the total allocation for **Action 8A** would be $50,000 annually for education and to implement actions.
Score (High- 5, Medium – 3, Low – 1)	High	High	Medium	High		

Table B-10: Strategy Evaluation - 8. Support Existing and New EPR Programs

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
10. Support Existing and New EPR Programs A. Advocate to the province to expand EPR programs. *Note: The Province is currently conducting an EPR gap analysis and considering adding new materials.* B. Collaborate with stewards to increase consumer awareness about EPR programs. C. Advocate for increased return-to-retailer opportunities. D. Advocate federally to standardize EPR programs across Canada.	▪ EPR programs must be informed by the needs of regions and constituents. Providing feedback as in **Actions 10A through 10D** are critical to build resilient and foundational EPR programming.	▪ No direct environmental impact is expected for this strategy; the increased relevance and practicability of EPR programs will indirectly improve diversion rates and participation. ▪ If the province proceeds with EPR for mattresses, textiles, plastics, CR&D materials this could have a high environmental impact.	▪ **Action 10B** will improve communication and the understanding of EPR within the communities impacted by it. This can assist with greater community ownership and adherence to EPR programs.	▪ No direct impact on waste disposal is expected for this strategy; the increased relevance and practicability of EPR programs could indirectly impact disposal rates in the future. ▪ If the province implements additional EPR programs this could reduce tonnage significantly.	**14**	▪ Funding may be required to educate the public if new disposal bans for EPR materials take effect at Hartland landfill.
Score (High- 5, Medium – 3, Low – 1)	High	Medium	Medium	Medium		

Table B-11: Strategy Evaluation 11. Increase Organics Diversion and Processing Capacity

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
11. Increase Organics Diversion and Processing Capacity A. Continue to promote organics waste diversion. B. Investigate developing a resilient local organics processing infrastructure. *Note: The CRD Board has directed staff to issue a RFEOI for an in-region or near-region organics processing facility.* C. Support compost markets by purchasing back materials. D. Collaborate with service providers and users (e.g., local businesses) to develop guidelines for use of compostable products and packaging.	▪ **Action 11A** is ongoing and feasible. ▪ **Action 11B** is continuing to proceed. Processing capacity is required for organics collected. ▪ The CRD can work with municipalities to support procurement of composted materials from local processors **(Action 11C)**. ▪ **Action 11D** requires coordination by CRD staff to develop guidelines and is feasible.	▪ Organics are currently diverted in the CRD – this has resulted in decreased disposal and reduction in GHG emissions from landfills. **Action 11A and 11B** is a continuation of existing efforts. ▪ Purchasing compost from local processors **(Action 11C)** supports principles of circular economy.	▪ Organics processing infrastructure supports organics diversion programs **(Action 11B)**. CRD residents support diverting organics over disposal at landfill. ▪ A resilient local organics processing infrastructure should appropriately manage odours from processing facilities which have the potential to create significant community impacts **(Action 11B)**. ▪ Supporting composting markets by purchasing compost (**Action 11C**) may have a positive social impact by improving the relationships between organics processing facilities and the CRD. ▪ **Action 11D** may have a positive social impact by creating engagement between key stakeholders, such as local businesses, and the CRD.	▪ 27% of the material disposed at Hartland is organic materials[19]. **Action 11A** may have a modest impact on reducing the quantity of organic material disposed. ▪ **Actions 11B through 11D** do not have a direct impact on disposal capacity.	**20**	▪ Additional required costs will be determined through the RFEOI process. ▪ Funding may be required to educate about use of compostable products and packaging.
Score (High - 5, Medium – 3, Low – 1)	High	High	High	High		

[19] In the 2016 waste stream characterization study, the proportion of organic materials was found to be 21.1%, which included only food and yard waste. The 27% stated herein also includes compostable paper.

Table B-12: Strategy Evaluation - 12. Increase Construction, Renovation and Demolition (CR&D) Material Diversion

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
12. Increase Construction, Renovation and Demolition (CR&D) Material Diversion A. Develop a comprehensive CR&D strategy, including characterization of materials, best practices, and pilot projects. B. Develop educational tools to support CR&D material diversion, e.g., create an industry toolkit, a deconstruction guide, and/or guidelines for diverting and utilizing reused materials. C. Promote green building standards. D. Continue collaboration with local governments to develop and use policy tools (e.g., construction permits, building codes) to maximize diversion and to align management plans. E. Investigate beneficial uses of CR&D waste, including a clean wood waste ban. F. Investigate banning or surcharging mixed CR&D loads at the landfill to encourage source separation G. Further develop programs for managing hazardous materials, like asbestos.	▪ This strategy is feasible however represents significant effort and resources for CRD staff. ▪ It is known that markets exist in the CRD for CR&D materials, however, **Action 12A** needs to be undertaken to understand the state of CR&D waste management in the region, characteristics of the waste stream, best practices from other jurisdictions, and approaches to enhance CR&D diversion. This is a first step to completing other Actions outlined in this strategy, including **Action 12B and 12G.** ▪ **Actions 12E and 12F** involve investigating disposal bans on CR&D materials. Other jurisdictions have implemented similar bans; thus, this is a feasible approach. Since the CRD has existing material bans, it should be relatively straightforward to adapt the existing disposal ban process for any materials that are added.	▪ **All actions** in this strategy support the goal to decrease the CRD's overall disposal. ▪ Green building standards (**Action 11C)** such as LEED typically require diversion and the use of sustainable materials. ▪ **Action 11E and 11F** require studying the environmental impacts of potential CR&D disposal bans. If such a ban was implemented, it would have significant implications, including a decreased disposal rate.	▪ Many CRD residents recognize that CR&D materials represent a large quantity of waste and are expected to be supportive of reuse and recycling efforts for this sector.	▪ The CR&D waste sector contributes 16% of the regional garbage**.** ▪ CR&D diversion rate in other jurisdictions is typically 60-75%. ▪ **All actions** in this strategy support the goal to decrease the CRD's overall disposal.	**18**	▪ Strategy 12 will require an additional $50,000 per year for two years. ▪ Additional funding may be required to investigate beneficial uses of CR&D waste and banning or surcharging mixed CR&D loads at the landfill.
Score (High- 5, Medium – 3, Low – 1)	High	High	Medium	High		

Table B-13: Strategy Evaluation - 13. Encourage Proper Public Space Waste Management Activities

Strategy And Associated Actions	Technical Feasibility and Effectiveness	Environmental Impact and Benefits	Social Impact	Effect on Waste Disposal	Score	Cost Considerations
13. Encourage Proper Public Space Waste Management Activities A. Develop educational materials to prevent and reduce litter and abandoned materials in our neighbourhoods and public spaces. B. Continue promoting alternatives to abandoned materials and illegal dumping by educating about proper management and disposal C. Collaborate with stakeholders, including local governments and private sector facilities, to develop a regional approach to illegal dumping. D. Investigate developing regionally-aligned bylaws. E. Develop and pilot methodologies to 'observe, record, and report' on abandoned materials and illegal dumping incidents throughout the CRD. F. Investigate options for large bulky item disposal, e.g., free drop-off days or large item pick-up days	▪ **Actions 13A through 13C** are feasible and should be ongoing programs. ▪ **Action 13D** is feasible and would require the CRD to coordinate with local governments to develop regionally-aligned bylaws. ▪ **Action 13E** is feasible if partners are found to collaborate with to assist in reducing illegal dumping. ▪ **Action 13F** would involve the CRD studying options for bulky item disposal.	▪ Illegal dumping and abandoned waste are more related to community issues and to the community's perception of the local environment.	▪ This strategy strives to reduce abandoned waste and illegal dumping, which are important social issues. **All Actions** should contribute to this goal. ▪ **Action 13F** would investigate possible social implications of the programs described.	▪ Theoretically, waste disposal would slightly increase if abandoning materials and illegal dumping was decreased, however, this is expected to be extremely minimal. ▪ **Actions 13F** would investigate waste disposal implications of the programs described.	**12**	▪ $20,000 for annual illegal dumping campaign for two years; evaluate effectiveness after two years.
Score (High- 5, Medium – 3, Low – 1)	High	Low	High	Low		

APPENDIX C

DIVERSION POTENTIAL ANALYSIS

					Short-Term Goal		Medium-Term Goal		Long-term Aspirational Goal	
Sector	Sector Contribution to Landfill (%)[1]	Material Type	Material Contribution to Landfill (%)	Material Contribution to Landfill (tonnes)	Expected Diversion Potential (%)	Per capita diversion potential (kg per capita)	Expected Diversion Potential (%)	Per capita diversion potential (kg per capita)	Expected Diversion Potential (%)	Per capita diversion potential (kg per capita)
Single-Family	25%	Curbside Recyclable Material	2.8%	4,316		0.0	20%	2.1	40%	4.2
		Depot Recyclable Material (EPR)	3.2%	5,022		0.0	35%	4.3	50%	6.1
		Wasted Food	3.8%	5,963	25%	3.6	50%	7.2	75%	10.8
		Inedible Organic Materials	4.9%	7,611	25%	4.6	50%	9.2	75%	13.8
		Clean Wood	0.1%	157		0.0		0.0		0.0
		Other Recyclable Building Materials	0.9%	1,452		0.0		0.0		0.0
		Textiles	1.8%	2,746		0.0		0.0	50%	3.3
		Bulky Objects	0.0%	0		0.0		0.0		0.0
Total Possible Divertable from SF			17.4%	27,267						
Multi-Family	13%	Curbside Recyclable Material	1.7%	2,652		0.0	50%	3.2	60%	3.8
		Depot Recyclable Material (EPR)	1.6%	2,448		0.0	25%	1.5	30%	1.8
		Wasted Food	2.0%	3,081	13%	0.9	25%	1.9	40%	3.0
		Inedible Organic Materials	2.9%	4,488	25%	2.7	50%	5.4	60%	6.5
		Clean Wood	0.0%	20		0.0		0.0		0.0
		Other Recyclable Building Materials	1.1%	1,734		0.0		0.0		0.0
		Textiles	0.6%	877		0.0		0.0	50%	1.1
		Bulky Objects	0.0%	0		0.0		0.0		0.0
Total Possible Divertable from MF			9.8%	15,301						
Bins	5%	Curbside Recyclable Material	0.1%	165		0.0		0.0		0.0
		Depot Recyclable Material (EPR)	0.4%	565		0.0		0.0		0.0
		Wasted Food	0.1%	110		0.0		0.0		0.0
		Inedible Organic Materials	0.4%	636		0.0		0.0		0.0
		Clean Wood	0.2%	369		0.0		0.0		0.0
		Other Recyclable Building Materials	0.9%	1,428		0.0		0.0		0.0
		Textiles	0.1%	157		0.0		0.0	50%	0.2
		Bulky Objects	0.3%	408		0.0		0.0		0.0
Total Possible Divertable from Bins			2.4%	3,837						
ICI	41%	Curbside Recyclable Material	6.4%	10,037		0.0	50%	12.1	70%	17.0
		Depot Recyclables	5.8%	9,137		0.0	25%	5.5	30%	6.6
		Wasted Food	5.8%	9,072	25%	5.5	50%	11.0	60%	13.2
		Inedible Organic Materials	7.2%	11,260	25%	6.8	50%	13.6	60%	16.3
		Clean Wood	0.2%	386		0.0		0.0		0.0
		Other Recyclable Building Materials	1.3%	2,059		0.0		0.0		0.0
		Textiles	2.6%	4,118		0.0		0.0	50%	5.0
		Bulky Objects	0.8%	1,287		0.0		0.0		0.0
Total Possible Divertable from ICI			30.2%	47,355						
CR&D	16%	Curbside Recyclable Material	0.1%	151		0.0		0.0		0.0
		Depot Recyclables	0.7%	1,155	50%	1.4	50%	1.4	55%	1.5
		Wasted Food	0.0%	0		0.0		0.0		0.0
		Inedible Organic Materials	0.0%	50		0.0		0.0		0.0
		Clean Wood	2.2%	3,465	70%	5.9	75%	6.3	75%	6.3
		Other Recyclable Building Materials	3.6%	5,574	60%	8.1	60%	8.1	60%	8.1
		Textiles	0.2%	251	50%	0.3	50%	0.3	55%	0.3
		Bulky Objects	0.1%	176		0.0		0.0		0.0
Total Possible Divertable from CR&D			6.9%	10,822						
				Reduction in Disposal		40		93		129
				New Disposal Rate		340		287		251
				New Disposal Target (kg/capita)		340		285		250

[1]The diversion potential analysis is based on the 2018 disposal of 156,931 tonnes.

APPENDIX D

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