INFRASTRUCTURE SERVICES COMMITTEE

Thursday, December 21, 2017
SCRD Boardroom, 1975 Field Road, Sechelt, B.C.

AGENDA

CALL TO ORDER: **9:30 a.m.**

AGENDA

1. Adoption of Agenda

PETITIONS AND DELEGATIONS

REPORTS

2.	Chief Administrative Officer Granthams Hall Rehabilitation Project Funding Plan **(Voting – A, B, D, E, F)**	Report to Follow
3.	Manager, Utility Services Water Demand Management Rebate Programs **(Voting – A, B, D, E, F, Sechelt, SIGD)**	Annex A pp 1 – 3
4.	Manager, Utility Services Water Metering Program Update **(Voting – A, B, D, E, F, Sechelt)**	Annex B pp 4 – 6
5.	Manager, Utility Services Chapman Creek Water Treatment Plant Chlorination Upgrade Study **(Voting – A, B, D, E, F, Sechelt)**	Annex C pp 7 – 55
6.	Chief Administrative Officer Regional Water Plan Timeline **(Voting – A, B, D, E, F, Sechelt)**	Annex D pp 56 – 68
7.	Chief Administrative Officer Infrastructure Planning Grants – January 2018 Applications **(Voting – A, B, D, E, F, Sechelt)**	Annex E pp 69 – 71
8.	Manager, Solid Waste Services Organics Diversion Strategy Update **(Voting – All)**	Annex F pp 72 – 120
9.	Manager, Solid Waste Services Solid Waste Work Plan Update (**Voting – All)**	Annex G pp 121 – 124

10. Manager, Solid Waste Services — Annex H
Gibsons Landfill Lease Agreement Replacement Tenure — pp 125 – 128
(**Voting – All)**

11. Manager, Solid Waste Services — Annex I
2017 Waste Reduction Initiatives Program Recipients — pp 129 – 131
(**Voting – All)**

12. Transportation Advisory Committee Minutes of October 19, 2017 — Annex J
pp 132 – 134

COMMUNICATIONS

13. Jennie Aikman, BC Parks, dated November 28, 2017 — Annex K
Regarding: Chapman Lake Expansion Project — pp 135

NEW BUSINESS

IN CAMERA

THAT the public be excluded from attendance at the meeting in accordance with Section 90 (1) (g) and (k) of the *Community Charter* – "litigation or potential litigation affecting the municipality;" and "negotiations and related discussions respecting the proposed provision of a municipal service…".

ADJOURNMENT

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Raphael Shay, Water and Energy Projects Coordinator, Infrastructure Services

SUBJECT: **WATER DEMAND MANAGEMENT REBATE PROGRAMS**

RECOMMENDATION(S)

THAT the report titled Water Demand Management Rebate Programs be received;

AND THAT a Rainwater Harvesting Rebate Program be brought to 2018 Round 1 Budget,

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BACKGROUND

The purpose of this report is to present options for a rebate program for residents supplied by an SCRD water system. These rebates would support the water metering program in the Intensive Demand Management (IDM) approach outlined in the Comprehensive Regional Water Plan (CRWP) and respond to the following resolution, adopted at the January 28, 2016 Regular Board Meeting:

081/17 **Recommendation No. 13** *Water Demand Management Rebate Program*

THAT staff report in the third quarter of 2017 on Washing Machine and Rainwater Harvesting Rebate Programs which include diverse approaches such as cisterns, cast in place concrete ponds and hardware and if deemed feasible presented as 2018 budget proposals.

The February 16, 2017 report to the Infrastructure Services Committee titled Water Demand Management Rebate Program evaluated these two possible programs.

DISCUSSION

Rainwater Harvesting Rebate Program

Rainwater Harvesting (RWH) systems can complement infrastructure by reducing demand when water is needed most and is least plentiful. More importantly, it can also lead to behaviour changes and increase the resilience of small scale food producers.

Staff recommend implementing a streamlined RWH Rebate Program with a two-step application. The first step would be a pre-approval and include photographic documentation of the site as well as commitment to the minimum storage size and catchment areas. The second step would include photographic documentation of work done, receipts of expenses and a checklist of system requirements. Minimum storage requirement would likely be 4,500 litres (~1,000 gallons) with a catchment area of at least 20 square metres (~200 square feet).

A rebate amount of $500 would be offered to reimburse rain harvesting cistern installation costs. A cap of $25,000 in rebates for this program would provide incentives to residents as well as provide staff with the ability to evaluate community interest and program effectiveness.

Additional requirements that may or may not be needed would be the responsibility of the property owner. These could include requirements associated with water quality, Plumbing Permits and backflow prevention, Building Permits, Development Permits or Geotechnical Development Permits. Cistern material and design would also be the responsibility of the property owner.

Water savings from RWH depend heavily on precipitation patterns and user behaviour. Assuming historical average summer precipitation and the minimum design sizes identified above, staff estimate maximum savings of 13,500 L/yr per system. Total annual savings for 50 systems would be approximately 670,500 litres per summer, or 0.03% of total SCRD water demand between May and October. Over a 10 year cistern lifespan, this rebate would cost the SCRD $3.73 per cubic meter of saved water.

Washing Machine Rebate Program

A Washing Machine Rebate Program will subsidize replacement of low-efficiency washing machines with high-efficiency machines. Such programs have been shown to have reasonable water savings, but relatively low uptake due to the high purchase price of eligible washers and the desire of purchasers to replace dryers at the same time.

A Washing Machine Rebate Program would be structured in a similar way to the current Toilet Rebate Program. A list of qualifying appliances would be generated and updated as the market evolved. Applicants would then bring proof of payment and model number to the SCRD. Once eligibility criteria are met, the SCRD would issue a disposal coupon to the applicant who would then drop off the old inefficient washing machine at the landfill with the coupon. Landfill staff would then inform Utilities staff and a rebate would be issued.

BC Hydro is interested in promoting energy efficiency and has partnered with local governments[1] on joint rebates recently and in the past. The SCRD can benefit from the knowledge gained in these partnerships. Their list of eligible washing machines are a selection of the best Energy Star models and all have an Integrated Water Factor (IWF)[2] of 3.2 or lower. The rebates are structured via month-long campaigns that have occurred twice per year in the past.

BC Hydro offers between $50 and $100 dollars for qualifying appliances. Based on BC Hydro's experience with other communities and on the Sunshine Coast, 80 rebates would be an optimistic target.

The SCRD could offer a $300 rebate per washing machine. A Sechelt Landfill fees of $7 for disposal of the old inefficient units would also be covered. The SCRD cost per unit would therefore be $307 for an estimated program cost of $24,560. The total incentive to residents would be between $357 and $407 per washing machine.

[1] These include Abbotsford, Mission, City of Richmond, City of Nanaimo, Township of Langley, City of New Westminster, City of Coquitlam, City of Vancouver, District of West Vancouver, City of North Vancouver, and Disitrct of North Vancouver.
[2] Integrated Water Factor is the number of gallons per cycle per cubic foot that the washer uses. A smaller number is more efficient.

Water savings from efficient washing machines can be estimated by using averages and the performance of the rebated machines. With these, staff estimate savings of 11,400 L/yr per machine. 80 rebates would save 912,000 litres per year. Only a part of these savings would occur during the summer when water is most scarce. The summer savings of 80 efficient machines represent .01% of total summer water demand. Modern washing machines are estimated to have an eight year life, which means the SCRD costs of water saved would be $3.37 per cubic metre.

A Washing Machine Rebate Program will not be recommended for consideration at this time due to a RWH Program's larger impacts on a per system basis as well as on summer water demand.

Organizational and Intergovernmental Implications

The rainwater harvesting rebate program would have cross departmental implications in cases where permits are required, however these costs would be covered by permit fees.

Financial Implications

The RWH Rebate Program budget of $25,000 is similar to what is currently allocated to the Toilet Rebate Program.

STRATEGIC PLAN AND RELATED POLICIES

The We Envision Regional Sustainability Plan (2012) has a water consumption reduction target of 33% relative to 2010 levels by 2020 (p.38).

The SCRD Strategic Plan has a priority to Embed Environmental Leadership, including the responsible management of the regions water supply.

The CRWP describes the 2012 SCRD Strategic Plan policy objective of reducing water consumption by 33% relative to 2010 levels by 2020 (CRWP, p. 1-2, p. 3-16).

The CRWP also describes the need for additional demand management programs beyond universal metering.

The SCRD Agricultural Area Plan has the strategic goal to secure a sustainable water supply for agriculture.

CONCLUSION

This report outlines how a Rainwater Harvesting Rebate Program and a Washing Machine Rebate Program would function and their impact on summer water demand. Staff recommend the Rainwater Harvesting Rebate Program for consideration in 2018 Round 1 Budget.

Reviewed by:			
Manager	X-S. Walkey	Finance	
GM		Legislative	
CAO	X-J. Loveys	Other	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Raphael Shay, Water and Energy Projects Coordinator

SUBJECT: **WATER METERING PROGRAM UPDATE**

RECOMMENDATION(S)

THAT the report titled Water Metering Program Update be received for information.

BACKGROUND

The purpose of this report is to provide an update on the universal water metering program and water conservation. Universal water metering was identified as a component of the Intensive Demand Management strategy outlined in the Comprehensive Regional Water Plan (CRWP). Once completed, universal water metering will see a water meter installed at every Sunshine Coast Regional District (SCRD) service connection.

DISCUSSION

Installations

The water meter installation program is divided into three phases. Phase One involved North Pender and South Pender water systems in Electoral Area A and was completed between August 2014 and February 2015. Phase Two involves the remaining water systems in Electoral Area A, Egmont and Cove Cay as well as the other Electoral Areas of Halfmoon Bay (B), Roberts Creek (D), Elphinstone (E), and West Howe Sound (F). Phase Two was substantially completed between September 2016 and October 2017. Phase Three will involve installations in the District of Sechelt and is planned for 2018-2019. Staff are awaiting news on the results of a grant for this phase. Discussions with shíshálh Nation will also be undertaken.

Phase two installations

Neptune Technologies Inc. has installed 4,672 meters representing 95% of Phase Two. Neptune Technologies Inc. will return in January of 2018 to install the remaining 222 meters.

Water conservation

Water meters enable conservation by identifying likely leaks, by increasing understanding of individual water consumption habits and through volumetric rate structures.

Meters are read monthly to pursue leaks and are also working towards sharing water consumption data online on myscrd.ca accounts. A rate structure review will include public consultation and occur after Phase Three meters are installed and meter reads provide the necessary data to inform a process.

Water meters are capable of detecting continuous water use, which is a consumption pattern that indicates the likelihood of a leak. Accounts with continuous water use are identified and staff communicate with the property owners using letters accompanied by educational material. The property owners repair leaks themselves or with the assistance of a plumber. In some incidents staff will visit a property to assist with locating a leak.

Between January and October of 2017, 1,170 properties were notified of likely leaks on their properties. 697 of these have been resolved. Approximately 500 are still registering a continuous water use and new leaks are being identified at every meter read across all areas. An estimated 2,135,000[1] litres per day are being no longer wasted through leaking pipes.

The table below summarizes the status of leaks and water savings per Electoral Area. Meter readings for Area F are still at the preliminary stages.

Area	Resolved leaks	Estimated m^3/day saved ($1m^3$ = 1,000L)	Total active leaks under investigation
North Pender	72	264	41
South Pender	144	542	83
B	230	615	110
D	121	362	107
E	115	254	128
F	15	98	23
TOTAL	**697**	**2,135**	**492**

Follow up with properties that have small consumption is monitored. Properties with larger consumption will be supported in developing a plan and timeline to resolve the leak. In cases where contact cannot be made with the property owner or tenant via phone, letter or e-mail correspondence, or with site visits, staff will look at exercising the authority to shut off water, found in Water Rates and Regulations Bylaw 422, section 9.1. Turning off a water service will only be used if a property is confirmed to be vacant and a significant leak remains unresolved.

STRATEGIC PLAN AND RELATED POLICIES

The SCRD Strategic Plan has a priority to Embed Environmental Leadership. By implementing a Universal Metering Program, the SCRD will reduce waste and promote conservation of water.

The Comprehensive Regional Water Plan has the objective or reducing water use by 33% from 2010 levels by 2020. This is principally to be accomplished via the Universal Metering Program.

[1] The estimates for daily water savings were done by calculating the difference between water consumption at a property during a leak and consumption after a leak is resolved. Seasonal changes in consumption as well as lack of information on timing of repair influence the accuracy of the estimates.

The We Envision Regional Sustainability Plan (2012) has a water consumption reduction target of 33% relative to 2010 levels by 2020.

CONCLUSION

Water meters have enabled the SCRD to identify likely leaks on private properties. In the last year, 697 leaks on private properties have been resolved saving an estimated 2,135,000 litres per day of treated water from being wasted through leaky pipes. Approximately 500 properties are still registering a continuous water use and new leaks are detected upon every meter read.

This report is presented for information.

Reviewed by:			
Manager	X-S. Walkey	Finance	
GM		Legislative	
CAO	X-J. Loveys	Other	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Shane Walkey, Manager, Utility Services

SUBJECT: **Chapman Creek Water Treatment Plant Chlorine Upgrade Study**

RECOMMENDATION(S)

THAT the report titled Chapman Creek Water Treatment Plant Chlorine Upgrade Study be received.

BACKGROUND

The purpose of this report is to provide background information and recommendations from a feasibility study on the existing chlorine gas injection disinfection system (Chlorination System) at the Chapman Creek Water Treatment Plant (WTP). The existing Chlorination System at the WTP is nearing the end of its life span and an alternative disinfection system to mitigate safety hazards is required. The following Resolution was adopted at the February 16, 2017 regular Board meeting:

068/17 **Recommendation No. 19** *Regional Water Service Area [370-378] – 2017 R1 Budget Proposal*

THAT the report titled 2017 R1 Budget Proposal for [370-378] Regional Water Service Area be received;

AND THAT the following budget proposal be approved and incorporated into the 2017 Round 2 Budget:

- Budget Proposal 1 – Chapman Water Treatment Plant Chlorination System Upgrade – Feasibility Study, $50,000 funded from Existing User Fees.

In an effort to eliminate the high safety hazards pertaining to the existing Chlorination System, Opus International Consultants Ltd. were retained to conduct a feasibility study to evaluate safer chlorination options. See Attachment A for the full report.

DISCUSSION

Options and Analysis

The main issues that influence the choice of chlorine disinfection method included:
- Safety of operators, ancillary contractors, and the general public
- Capital costs of new equipment and construction
- Ongoing operation and maintenance (O&M) costs

- Resiliency, operability, and operation intensity of the system selected
- Logistic concerns with shipping chemicals and the potential for disruption of supply

A technical review of five options were recommended by the consultant. Three options were selected for an advanced feasibility study, where the long term impacts of each were assessed with SCRD staff in a technical workshop. The results of the workshop was an evaluation matrix and life cycle cost analysis for the three preferred options.

The three options chosen for detailed analysis were Chlorine Gas (which would be an upgrade to the existing chlorination system with newer and safer technology), 0.8% On-Site Hypochlorite Generator (OSHG), and Bulk 12% Sodium Hypochlorite.

The evaluation matrix consisted of a select list of criteria that were grouped into three categories: cost, safety, and operations/logistics. A scoring system was used in the matrix to further narrow down the three options.

The initial capital cost estimates of the three preferred options were cost prohibitive due to the capital expenditures required for a new building. The first round of estimates for the three options ranged from $1.8 Million to $2.5 Million. Options were re-considered to understand if the systems can be placed into the existing Chapman Creek WTP building.

The next round of options only considered 0.8% OSHG and Bulk 12% Sodium Hypochlorite as they can both be installed into the existing WTP without compromising safety objectives. The option of Chlorine Gas was removed from the list of options because this method of chlorine disinfection requires a stand-alone building.

Table 1. Description, Pros and Cons of the Chlorine Disinfection Options

	0.8% OSHG	**Bulk 12% Hypo.**
General Description	This system utilizes high purity coarse salt, softened water, and electricity to produce 0.8% sodium hypochlorite on site.	This system utilizes a 12% sodium hypochlorite solution that is delivered in bulk form via transport.
Pros	- Low environmental impact in the event of a spill - Safe raw chemical (salt) - Salt has a long shelf life - ability to store a lot for a long period of time - Does not require significant structural building upgrades in WTP - Lower operating costs	- Lower capital costs - High turn-up / turn down capability - Similar system to surrounding sites within the Regional District - Simple system with limited mechanical equipment
Cons	- Requires electrolytic cell cleaning and replacement - Complex process equipment - Higher Capital costs	- 12% Sodium Hypochlorite is a class B oxidant and highly corrosive, requiring specialized personal protective equipment to handle - Chlorine concentration degrades over time, short shelf life - Transportation is expensive - High risk of environmental impact if there were a spill - Solution will off-gas in pipe work - Requires new 2 hour fire rated masonry block room

The results from the feasibility study recommend a 0.8% On-site Hypochlorite Generator as the most suitable option for replacing the existing chlorine gas injection disinfection system at the WTP.

Financial Implications

Table 2. Up-front Capital Costs (Class C) for Chlorine Disinfection Options

Item	**0.8% OSHG**	**Bulk 12% Hypo.**
Equipment, electrical & commissioning	$350,000	$255,000
Mark up's, installation, indirect costs, engineering & contingency	$342,000	$267,000
Total	**$692,000**	**$522,000**

Table 3. Annual Operating Costs for Chlorine Disinfection Options (Current dollars)

Annual O & M Expenses	**0.8% OSHG**	**Bulk 12% Hypo.**
Per Year	$34,320	$49,030
After 5 years	$171,600	$245,150
After 10 years	$430,200	$629,740

Table 4. Total Estimated Capital and Operation & Maintenance Expenses after 10 years

10 year Expenses	**0.8% OSHG**	**Bulk 12% Hypo.**
Capital Expenses	$692,000	$522,000
Operational and Maintenance Expenses	$430,200	$629,740
Total	**$1,122,200**	**$1,151,740**

STRATEGIC PLAN AND RELATED POLICIES

The Chapman Creek Water Treatment Plant Chlorine Upgrade supports the following Strategic Priority:

- Strategic Priority: Embed Environmental Leadership through the responsible management of the regions' water supply.

CONCLUSION

The existing Chlorination System at the WTP is nearing the end of its life span and an alternative disinfection system to mitigate safety hazards is required.

In an effort to eliminate the high safety hazards pertaining to the existing chlorination system, Opus International Consultants Ltd. were retained to conduct a feasibility study to evaluate safer chlorination options. Following the detailed analysis of the feasibility study the consultants are recommending the 0.8% OSHG as the most suitable option for the SCRD's consideration.

ATTACHMENT

Attachment A: Chapman Creek Water Treatment Plant - Chlorine Upgrade Study

Reviewed by:			
Manager	X-S. Walkey	Finance	
GM		Legislative	
CAO	X-J. Loveys	Other	

Sunshine Coast Regional District

Chapman Creek Water Treatment Plant

Chlorine Upgrade Study

OPUS

Sunshine Coast Regional District

Chapman Creek Water Treatment Plant

Chlorine Upgrade Study

Prepared By

Dec 13, 2017

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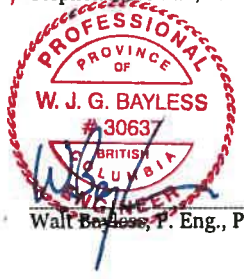
Approved for Release By



DEC 13 2017

Walt Bayless, P. Eng., PM

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Attachment B – Concept Layout Drawings

Attachment C – Capital Cost Estimate

Attachment D – Evaluation Matrix

Attachment E – Short Term Concept Layout Drawings

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Executive Summary

The Sunshine Coast Regional District (Regional District) requested proposals to provide a feasibility study for a safer alternative to the existing chlorine gas injection system at the Chapman Creek Water Treatment Plant (WTP). This feasibility study assessed five options for chlorine disinfection systems and then performed a detailed analysis of the three preferred options, to recommend a single option for the SCRD to proceed with.

The current desired chlorine dosing rate is 1.4 mg/L with an average annual usage of 19.3 kg / d Chlorine Equivalent (Cl eq.), and a peak daily consumption of 33.6 kg Cl eq./d. For this study, the design basis for a new chlorine disinfection system was sized to match the current system's maximum capacity of 45 kg Cl eq./d. Storage requirements for the new chlorine system assume at least one week (7 days) supply at the maximum usage rate, in the event of a failure.

The five options were evaluated based on life cycle costs over a 25 year period; the systems included:

1. Replacement chlorine gas system,
2. On-site sodium hypochlorite (0.8% NaClO & 12% NaClO) generation system;
3. Bulk delivery sodium hypochlorite (12% NaClO) system;
4. Calcium hypochlorite (68% Ca(ClO)2) puck system; and
5. Sodium dichloroisocyanurate (NaDCC) tablet system.

The life cycle cost for options 1) Replacement chlorine gas, 2) On-site 0.8% NaClO generation, and 3) Bulk delivery of 12% NaClO systems were the most cost effective, and these three systems were advanced to complete more detailed analysis.

The detailed analysis consisted of developing a Class C cost estimate for capital costs, a detailed operations and maintenance (O&M) cost estimate, and an evaluation matrix using weighted criteria scores. The highest ranked option was No.: 2, On-site 0.8% NaClO generation, with a score of 598 out of a possible 880. A summary of the three option's score is provided in the table below.

Criteria	Chlorine Gas	0.8% On-site Generation	Bulk 12% Sodium Hypochlorite
TOTAL SCORE (out of 880)	**362**	**598**	**572**

Phased implementation of the two highest ranking options was considered, utilizing space within the existing WTP to accommodate the new chlorination system until a permanent location can be determined during the next planned WTP upgrade. The onsite generation system placed in the WTP building had a capital cost estimated at $692,000, the estimated life cycle cost was the lowest, and this option received the best score in the evaluation matrix. Based on this analysis, the recommended approach for SCRD to replace the existing chlorination system includes retro-fitting the existing WTP with a new 0.8% on-site hypochlorite generation system and planning for permanent facilities to house the new chlorination system as part of the next major facility upgrade.

1 Introduction

The Sunshine Cost Regional District (SCRD) operates the Chapman Creek Water Treatment Plant (WTP), that supplies water to more than 80% of the residents on the Sunshine Coast. The treatment process includes flash mixing and flocculation, dissolved air flotation (DAF), dual media filtration (anthracite coal and sand), primary ultraviolet disinfection followed by gas chlorination and soda ash addition. The SCRD has tasked Opus with investigating the potential to upgrade or replace the existing gaseous chlorine system to mitigate safety hazards pertaining to chlorine gas.

Gaseous chlorine is currently supplied in ton containers, whose flowrate is controlled with a vacuum regulator. Chlorine injection is currently achieved with three injection points, each with a maximum dosing rate of 45 kg/day. The Regional District reported in the Request of Proposal (RFP) an average annual chlorine consumption of 14 kg/day and 27 kg/day on peak days.

2 Scope & Methodology

Opus International has conducted a feasibility study of five options to upgrade the existing chlorine gas disinfection system. The five options were compared on a 25 year life cycle cost comparison. Vendor quotes, and historical data were compiled for capital costs, operating and maintenance costs. The initial cost estimates were developed for comparison only.

Of the five options investigated, three were selected for detailed analysis. For the detailed analysis, the capital cost estimate was further detailed, and would be considered of Class C accuracy. Further, detailed operating and maintenance costs were compiled, and included expected expenses for safety equipment, training and recertification of both equipment and operators where necessary. The capital, operating and maintenance costs were used as inputs to the evaluation matrix, with the remaining non-financial fields completed during a workshop with SCRD Engineering and Operations personnel.

The criteria used to inform the evaluation of potential alternatives for the WTP chlorine disinfection system were grouped into the following three general categories;

- Safety of operators, ancillary contractors (suppliers), and the general public, including;
  - » Potential for environmental impacts during construction, operation, or transportation.
  - » Emergency response planning, training and certification requirements for operators.
- Cost, both capital cost of new equipment & construction, and operating and maintenance costs.
- Operation & Logistics, including resiliency, operability and operation intensity of the system selected. Logistic concerns with shipping chemicals, and potential for disruption of supply.

3 Review Existing System

The existing gas chlorination process has three injection points with each capable of dosing/supplying at a rate of 45 kg/d. During normal operation dosing occurs at one injection point at a rate of 1 mg/L in the post treatment process (pre-clear well). From the historical data provided, the average annual chlorine usage is 14 kg/d (flow of 160 L/s). At peak daily flow (312 L/s), chlorine usage increases to 27 kg/d.

It has been expressed by operations staff that the current system is nearing the end of useful service life. The system will require considerable time and monetary investment to be maintained in safe and good working order. The current chlorine infrastructure presents the following challenges;

1. Training and qualification requirements for the safe handling, operation and maintenance of a chlorine gas systems are quite onerous. Knowledge and training gaps within the SCRD operations staff has limited capacity to complete the recommended maintenance activities.
2. All emergency response must be by the operators, the local fire department has indicated they are not equipped to deal with a release of chlorine gas.
3. The current building housing the chlorine gas does not meet current WorkSafeBC requirements, specifically
   a. The building is not air tight,
   b. There is no scrubber to contain a release of chlorine gas from entering the atmosphere, and
   c. The gas release evacuation zone has not been identified by a qualified person.
4. Equipment is nearing its asset life expectancy

4 Design Criteria

Recently, the chlorine dosing rate was increased by SCRD operations to 1.4 mg/L to allow for a higher residual of approximately 1.0 mg/L. The peak and average daily chlorine use were extrapolated from historical information provided by the SCRD, to match the increased dosing rate of 1.4 mg/L. The new expected dosing rates for the design basis are:

- Peak daily chlorine use: 33.6 kg Cl eq./day
- Average daily chlorine use: 19.3 kg Cl eq./day

While the existing system can deliver chlorine to each injection point at 45 kg/d, from discussions with SCRD, it was determined that the system design criteria would not need to match this. However, to provide increased system resiliency and accommodate future growth considerations the new system will be designed to be capable of a maximum rate of 45 kg Cl eq./d.

Storage tanks capable of storing enough volume of each product for one week's (7 days) use at the maximum daily rate of 45 kg Cl eq./d will be included for redundancy in the event of a failure.

The existing injection points for the chlorine system will be maintained and the primary injection point will remain at the effluent box reservoir. The new chlorine injection system will have a pump head of approximately 2 m.

5 Alternative Disinfection Systems

A technology review was completed on five alternate options to the existing gaseous chlorine system. The evaluated options were:

- Replacement chlorine gas system
- On-site sodium hypochlorite (0.8% NaClO & 12% NaClO) generation systems
- Bulk delivery sodium hypochlorite (12% NaClO) system
- Calcium hypochlorite (68% Ca(ClO)2) puck system
- Sodium dichloroisocyanurate (NaDCC) tablet system

Process Flow Diagrams (PFDs) were produced to summarize the major equipment and controls involved for each option, included as Attachment A. Each system had capital, operating and maintenance costs estimated. The five options were then evaluated based on life cycle costs over a 25 year period.

5.1 Chlorine Gas System

SCRD could continue to use a chlorine gas system. Upgrading the existing chlorine system will require a new building and all new equipment. Chlorine gas would be transported in tonner containers and stored on site. The chlorine gas is typically injected under a vacuum into a side stream treated water feed, which is then returned to the main treated water supply. A large number of safety systems are required for handling of chlorine gas systems.

The main issue with a chlorine gas system is the safety both on and off site. This must be considered in the selection process as more safety equipment and procedures are required for this option. Also, the transport of chlorine to site via barge is a higher risk procedure, compared to alternative options. If a chlorine container were to fail, this would be a serious hazard to the environment and have harmful effects. While the nearest residents are relatively far away, the WTP is located adjacent to an operating quarry. The impact of a chlorine release for each of these must be considered.

Advantages:

- Chlorine gas is competitively priced.
- Operators currently use this system.
- Capable of simple and accurate dosing.
- Very stable, with a long shelf life.

Disadvantages:

- High capital cost to build a system to current standards.
- Transport, storage and handling of highly toxic chlorine gas.
- Regular certification of safety equipment.
- Emergency plans and documentation required.
- Potential for adverse environmental impact in the event of a spill or release.

5.2 On-Site Sodium Hypochlorite Generation

5.2.1 On-Site 0.8% Sodium Hypochlorite Generation

On-site sodium hypochlorite generation systems (OSHG) can produce a lower strength solution (~0.8%) of sodium hypochlorite. This is the most common type of OSHG on the market and therefore the support and competitive pricing for this product would be the most extensive.

One benefit of this system is that operators are able to handle a less corrosive chemical. The system would utilize high purity (99.7%) coarse salt, softened water, and electricity to batch produce 0.8% sodium hypochlorite on site. In this process, salt and water are mixed to saturation in a brine tank. The resulting brine solution is fed through an electrolytic cell, which produces sodium hypochlorite and hydrogen gas. The hydrogen gas is removed via the hydrogen dilution blowers and vented outside.

Typically, 3.0 kg of salt, 4.4 kWh of power, and 125 L of water is required to produce 1 kg of chlorine through the OSHG system.

Advantages:

- Greater dosing control and accuracy compared to 12% NaClO due to lower solution concentration.
- Relatively low environmental impact in the event of an uncontained spill.
- Increased storage capacities due to relatively inert and low hazard raw product (salt).
- Salt is not a regulated commodity, and can be transported on a passenger ferry, compared to alternative options, which must be transported on a hazardous materials barge.

Disadvantages:

- More frequent operator attention - electrolytic cell acid cleaning and replacement.
- Larger system footprint from the solution and brine storage tanks.
- Complex process requires specialty support from vendor for long term maintenance.

5.2.2 On-Site 12% Sodium Hypochlorite Generation

On-site generation systems can also produce higher strength 12% sodium hypochlorite. This system would utilize high purity (99.7%) coarse salt, softened water, and electricity to batch produce 12% sodium hypochlorite on site. In this process, salt and water are mixed to saturation in a brine tank. The resulting brine solution is fed through multiple electrolytic cells, producing weak sodium hypochlorite and refining it to 12% sodium hypochlorite, with hydrogen gas as a byproduct. The hydrogen gas is removed via the hydrogen dilution blowers and vented outside. The system also includes a tank capable of holding seven (7) days storage of sodium hypochlorite.

The main advantage of this option is that excess 12% sodium hypochlorite can be used at the surrounding water treatment plants without having to ship hazardous chemicals. This could reduce shipping costs for all water treatment plants in the area.

This system will have the highest capital cost because it will require the most complete mechanical equipment and has the largest footprint.

Advantages:

- Excess product can be used at other sites in the surrounding area.
- Reduced environmental impact in the event of an uncontained spill.
- Smaller dosing storage tank required compared to 0.8%.

Disadvantages:

- Limited municipal installations of this technology, limited local support.
- More frequent operator attention - electrolytic cell acid cleaning and replacement.
- Largest system footprint.
- Highest capital costs.
- Highest power consumption.
- 12% sodium hypochlorite which is a Class 'B' oxidant and highly corrosive, requiring specialized personal protective equipment (PPE) to handle.
- Solution prone to off-gas in storage and dosing infrastructure.

5.3 Bulk Delivery 12% Sodium Hypochlorite

Sodium hypochlorite would be delivered to site on a hazardous materials barge in a chemical tanker truck. The solution would be pushed / pumped into storage tanks and used as needed, by diffusing in water to create a weak solution to allow for accurate dosing and better mixing.

The transport of 12% sodium hypochlorite to site via barge add significant delivery costs and presents environmental and safety risks. 12% sodium hypochlorite is a class 'B' oxidant and highly corrosive, requiring specialized personal protective equipment to handle. Pipework must also be designed to limit the effects and potential health & safety issues of off-gassing.

Advantages:

- Low capital cost.
- Better accuracy than tablet type systems.
- High turn-up / turn-down capability.
- Similar system to surrounding sites.
- SCRD are familiar with 12% sodium hypochlorite, as it is used at other WTPs.

Disadvantages:

- Transport, storage and handling of a Class B hazardous material.
- 12% sodium hypochlorite is a Class 'B' oxidant and highly corrosive, requiring specialized personal protective equipment to handle.
- Limited storage life due to decay; reduced chlorine, and increased chlorate concentrations.
- Solution prone to off-gas in storage and dosing infrastructure.

5.4 Calcium Hypochlorite Pucks

Calcium hypochlorite systems use 68% calcium hypochlorite tablets which are slowly eroded by a stream of water. The system typically consists of a sealed rigid cylinder that contains the calcium hypochlorite tablets. At the bottom of the cylinder is a sieve plate, with holes, allowing flowing water to contact the bottom tablet and erode it to form a chlorinated solution. The concentration of the solution depends on the rate of flow through the chlorinator. The solution is injected into a watermain through a diffuser.

The advantage of this option is it provides a safe way to handle and store large amounts of stable chlorine. Due to the nature of how this system makes chlorine, the dose concentration is less accurate than other systems and requires more maintenance. The chemicals (tablets) used by this system are one of the more expensive options and has less market competition.

Advantages:

- Easy to handle & limited risk to worker safety.
- Calcium hypochlorite tablets are very stable and have a long storage life.

Disadvantages:

- Less accurate and more variability in dosing.
- Requires a compound loop control.
- Requires more maintenance.
- Second most expensive product.

5.5 NaDCC Tablets

Sodium Dichloroisocyanurate (NaDCC) is a tablet based chlorine disinfection. The tablets have a long shelf life and have a reduced chlorine taste & smell. However, this product is not as commercially available in self-controlled make-up units. The tablets are often manually added to bulk water containers rather than added to a water stream. Therefore, the engineering costs to design and implement this solution would be more expensive than alternatives. Also, the chemicals (tablets) are the most expensive options and have less market competition.

Advantages

- Easy to handle & limited risk to worker safety.
- Tablets are stable and have a long storage life.

Disadvantages

- Less accurate and more variability in dosing.
- Highest chemical costs.
- Requires a compound loop control.
- Requires more maintenance.
- Not commercially available for this sized system.

6 Life Cycle Analysis

The capital cost, operating and maintenance costs were estimated for each alternative disinfection system. The estimated capital costs are summarized in Table 1, and were for comparison only.

Table 1: Capital Cost Estimates

	Chlorine Gas	On-site 0.8% Generation	On-site 12% Generation	Bulk Sodium Hypochlorite (12%)	Calcium Hypochlorite (65%)	NaDCC
System Cost	$309,000	$245,500	$491,000	$51,000	$91,500	$98,500
Building Cost	$195,000	$195,000	$100,000	$180,000	$100,000	$180,000
Pipe & Fittings	$8,000	8,000	$8,000	$6,000	$8,000	$8,000
Electrical	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Installation	$9,000	$10,000	$10,000	$8,000	$10,000	$10,000
Commissioning	$7,500	$7,500	$7,500	$6,500	$8,500	$8,500
Subtotal	$538,500	$476,000	$626,500	$261,500	$228,000	$315,000
20% Contingency	$107,700	$95,200	$125,300	$52,300	$45,600	$63,000
TOTAL COST	**$646,200**	**$571,200**	**$751,800**	**$313,800**	**$273,600**	**$378,000**

The operating and maintenance costs were estimated with data from vendors, chemical suppliers and historical operating information from both the SCRD and Opus' past experience. The total estimated expenditure in present value for each option over 25 years, is included in Figure 1, below.

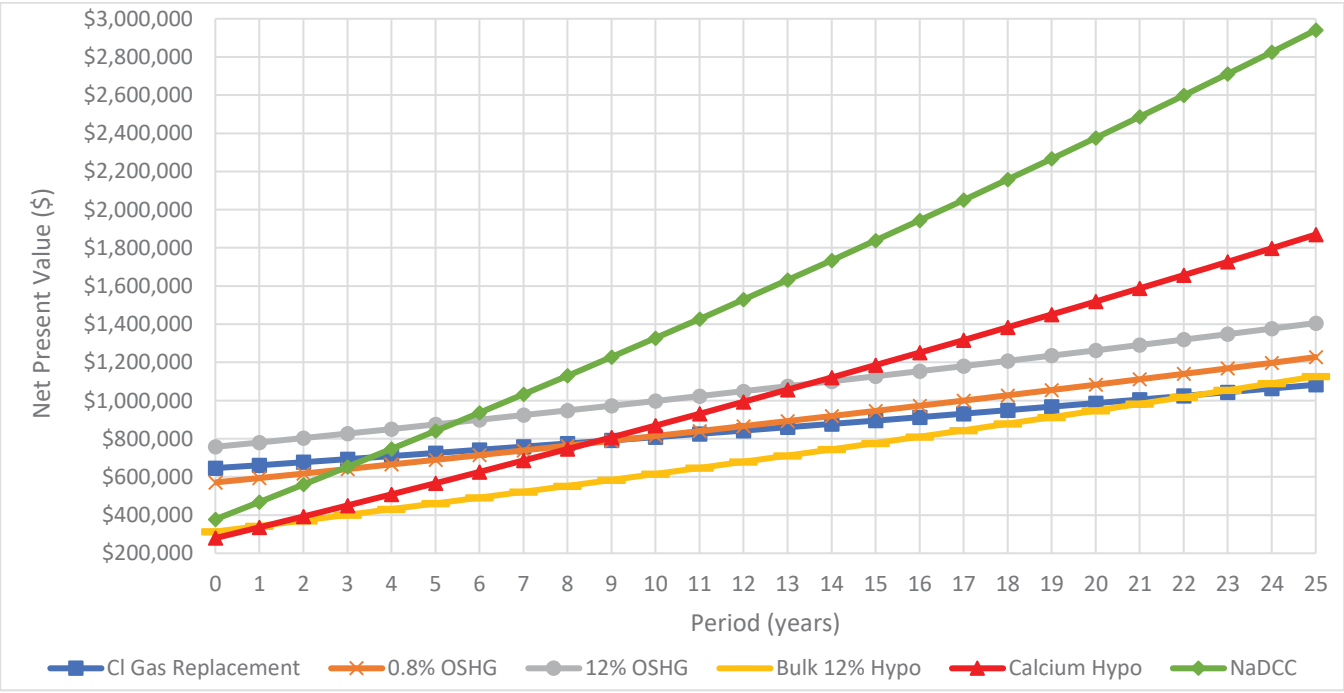


Figure 1: Life Cycle Cost Graph

The 12% OSHG system has the highest estimated capital cost and the third highest life cycle cost. 12% OSHG systems are very complex and more economical for larger installations in more remote areas. Both the calcium hypochlorite and NaDCC systems had the highest raw chemical costs which made them not economically viable.

For the above reasons 12% OSHG, calcium hypochlorite and NaDCC will not be considered in the detailed analysis stage of this feasibility study.

The three systems that were selected to advance to the detailed analysis stage were:

- Chlorine gas system
- On-Site 0.8% sodium hypochlorite generation
- Bulk 12% sodium hypochlorite

7 Detailed System Definition

The detailed analysis consisted of creating a Class 'C' cost estimate for capital costs, a detailed operations and maintenance (O&M) cost estimate, and an evaluation matrix using weighted criteria scores. The capital, operating and maintenance costs were used as inputs to the evaluation matrix, with the non-financial criteria ranking to be completed during a workshop with SCRD Engineering and Operations personnel.

7.1 Chlorine Gas Replacement

7.1.1 Standards/Regulations

During the design and operation stages it is recommended that the WorkSafe BC Chlorine Safe Work Practices (BK28) document be followed. The Chlorine Institute also provides a number of pamphlets which can assist in the design and operation of a chlorine system.

To maintain an acceptable level of safety at a chlorine gas system, procedures and plans must be in place and be kept up to date. This should include but not limited to:

- Workplace Hazardous Materials Information System (WHMIS),
- Exposure control plan,
- Health and safety program,
- Respiratory protection program and certification,
- Emergency procedures and evacuation plan, and
- Training plan and schedule.

7.1.2 System Sizing/Capacity

The system would have the same maximum dosing rate of 45 kg Cl eq./day as the existing gas system at Chapman WTP. The dosing rate has been increased to 1.4 mg/L to allow for a residual of 1.0 mg/L. Table 2 gives a summary of the overall system sizing.

Table 2: Chlorine Gas System Sizing

Description	Values
Average dose	1.4 mg/L
Average daily chlorine consumption	19.3 kg/day
Average monthly gas chlorine consumption	580 kg/month
Tonner capacity	907 kg
Number of active tonners	2
Total number of tonners	5

The average usage of chlorine gas is approximately two tonners in a three month period. The system should be capable of having two chlorine tonners connected at one time. This will reduce the frequency of tonner change overs and increase the redundancy within the system.

The chlorine storage room will contain five tonners in total; two online, two replacements and one back-up. Every three months, two chlorine tonners will be delivered to site and two empty tonners taken away.

With two tonners online at any given time, the system has the potential for two tonners to leak chlorine gas and therefore the scrubber system must be sized for 2 tons of chlorine gas. Table 3 lists the equipment proposed for the chlorine gas system:

Table 3: Proposed Major Chlorine Gas Equipment

Qty	Component Description
5	Chlorine gas tonners (2 online, 2 replacements, 1 back-up)
1	Tonner lifting system and one scale per connected tonner
2	Chlorinators
2	Vacuum regulators and gauge
2	Ejector and cylinder connection equipment
2	Automatic shut-off system
2	Dilution pumps
1	Gas monitor
1	Ventilation Fans and HVAC system
1	Gas Scrubber (2 ton chlorine gas capacity)

7.1.3 Facility Requirements

A new building will be required to house the chlorine gas tonners, ventilation fans, dosing equipment and control room. The system layout will be similar to the gaseous system currently on-site; however, the building will need to be slightly larger to allow for the additional equipment related to the new chlorine gas regulatory requirements. External to the building will be the gas scrubber on a concrete slab with road access to allow for caustic soda replacement.

The new building will consist of four separate rooms, all with adequate HVAC and ventilation. The chlorine storage, equipment and ejector rooms shall all have a ventilation system that is capable of a minimum of twelve (12) air changers per hour.

A delivery area is required to allow 2-3 chlorine gas tonners to be unloaded from a delivery truck and moved into the storage room. A monorail crane into the storage room will allow the tonners to be moved into place and swapped in and out of duty.

Refer to Attachment B for an indicative site layout.

7.2 On-Site 0.8% Sodium Hypochlorite Generation

7.2.1 Standards/Regulations

There are no specific standards for redundancy of OSHG systems in British Columbia, Alberta offers guidance in their *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems* (2006). These standards are considered practical and it is suggested that they be used as a reference. In terms of redundancy, the following two alternatives were considered:

- Alternative A: One duty plus one auto-start standby (100 % redundancy) OSHG unit sized to generate 0.8% sodium hypochlorite solution at the maximum design rate (45 kg Cl eq./day) with storage capacity of 6,000 L, which is equal to a single day supply of 0.8% sodium hypochlorite at the maximum design rate.
- Alternative B: One duty OSHG unit sized to generate 0.8% sodium hypochlorite solution at the maximum design rate (45 kg Cl eq./day) with storage capacity of 40,000 L, which is equal to 7-day's supply of 0.8% sodium hypochlorite at the maximum design rate.

7.2.2 System Sizing/Capacity

It is proposed that a single electrode 45 kg Cl eq./day OSHG system be used for this study to meet the maximum daily dosing rate. This OSHG system will be fed from a 2,000 L brine tank which will be manually filled with salt from either bags or bulk salt pellets. This sized brine tank gives the operators flexibility in filling frequency with a maximum time between fills of 25 days at the average dosing rate.

For redundancy purposes, alternative B above has been selected as the preferred option as it reduces the amount of mechanical equipment and in turn reduces the maintenance costs and time. If plant capacity increases such that the peak rate requires 45 kg Cl eq./d, a second generator would be required.

Two 20,000 L Fiber Reinforced Plastic (FRP) tanks have been selected as the storage vessels. Separating into two tanks allows one tank to be taken off-line for maintenance while keeping the second tank on-line. A transfer pump has been included to allow for chemical transfer between the tanks. During low demand periods, one tank could be taken off-line which would increase the life of the tank. A hydrogen dilution system with duty/standby blowers will be connected to both storage tanks.

Table 4, outlines the overall system sizing.

Table 4: Overall System Sizing

Description	Values
Average dose	1.4 mg/L
Average daily chlorine consumption	19.3 kg/day
Generator size	45 kg Cl/day
Average salt consumption	60 kg/day
Average monthly salt consumption	1,800 kg/month
Brine tank size	2,000 L
Maximum 7-day produced volume	39,375 L
Storage tank capacity	20,000 L
Number of storage tanks	2

During an average day demand and a dose of 1.4 mg/L it is estimated that 60 kg of salt will be consumed per day, which gives an average monthly demand of 1,800 kg. Storage for at least three tonner sacks should be allowed for and two tonner sacks being delivered per month, or equivalent pallet storage.

Table 5 lists the major pieces of equipment in the proposed OSHG system:

Table 5: Proposed OSHG Equipment – Major Components

Qty	Component Description
1	45 kg/d titanium electrode with temp/level control in clear acrylic housing
1	Powder coated skid with interconnected piping and wiring
1	Master PLC
1	Water softener
1	Hydrogen dilution system with duty/standby blowers and hydrogen detector
1	Transformer Rectifiers
1	12 kW inline water heaters
1	Brine pump
1	2,000 L PE brine storage tank with level transmitters and appurtenances
2	20,000 L FRP hypochlorite storage tanks with ladder access, level transmitters and appurtenances
1	Chemical Metering pumps skid (duty/standby pumps)
1	Transfer pump
2	Dilution pumps (duty/standby)

7.2.3 Facility Requirements

A new building will be required to house the hypochlorite generation unit, storage tanks and the electrical room. The generation unit, brine tank and salt will all be housed in one room while all electrical equipment will be located in the electrical room.

The storage tank room will have a recessed floor with the two 20,000 L FRP tanks on elevated plinths to accommodate the required containment volume. Floor grating over the recesses will allow access to all equipment. Area for an elevated walkway between the storage tanks has been allowed for to make accessing the top of the tanks easier but not included in the base cost estimate.

A bulk vehicle off-loading and a delivery station for salt will be required and sized for semi trucks and trailers. It is also possible to store additional salt in the existing chlorine gas building once it has been decommissioned. The salt essentially has no shelf life and therefore large amounts could be delivered to site which would decrease costs and also decrease the systems reliance on the chemical transport. A potential of up to six months of salt could be stored in this building.

Refer to Attachment B for an indicative site layout.

7.3 Bulk Delivery 12% Sodium Hypochlorite

7.3.1 Standards/Regulations

High strength 12% sodium hypochlorite is a class 'B' oxidant and highly corrosive, requiring specialized personal protective equipment to handle. It is considered a hazardous chemical and therefore the system must be designed accordingly to not allow any uncontrolled spills or contamination. Also, all pipework must be designed to accommodate the effects and potential health & safety risks of chemical off-gassing.

The design consideration that one must consider for a solution of 12% sodium hypochlorite pertain to its hazards, the primary ones being;

- 12% sodium hypochlorite is a strong oxidizer, reacting with most materials; and
- 12% sodium hypochlorite decomposes into chlorine gas and oxygen – piping and in particular ball valves need pressure relief.

7.3.2 System Sizing/Capacity

Table 6 outlines the overall system sizing.

Table 6: System Sizing Summary

Description	Values
Average dose	1.4 mg/L
Average daily chlorine consumption	19.3 kg/day
Sodium hypochlorite concentration	12%
Average monthly hypochlorite use	4,830 L/month
Sodium hypochlorite shelf life	60 days
Storage tank capacity	15,000 L
Number of tanks	2

It is proposed that two 15,000 L FRP tanks be used as sodium hypochlorite storage vessels. Sodium hypochlorite will decay over time which decreases the amount of active chlorine in solution. It is recommended that 12% sodium hypochlorite be stored at site for no more than 60 days.

The 15,000 L tank was selected to enable bulk 10,000 L deliveries at high demand periods and reduce the deliver costs. During low flow periods, the chemical can be delivered in totes and transferred into the storage tanks.

Two tanks allow for one tank to be taken off-line for maintenance while keeping the second tank on-line. A transfer pump has been included to allow for chemical transfer between the tanks. During low demand periods, one tank could be taken off-line which would increase the life of the tank.

Table 7 lists the major pieces of equipment in the bulk sodium hypochlorite system:

Table 7: Proposed Bulk Sodium Hypochlorite Equipment – Major Components

Qty	Component Description
1	Master PLC
1	Delivery compressor and bulk truck delivery system
2	15,000 L FRP bulk hypochlorite storage tanks with ladder access, level transmitters and appurtenances
1	Chemical Metering pumps skid (duty/standby pumps)
1	Transfer pump
2	Dilution pumps (duty/standby)

7.3.3 Facility Requirements

A new building will be required to house the sodium hypochlorite storage tanks and electrical room. The storage tanks room will have a recessed floor with the two 15,000 L FRP tanks on elevated plinths to accommodate the required containment volume. Floor grating over the recesses will allow personal access to all equipment. Area of an evaluated walkway between the storage tanks has been allowed for to make accessing the top of the tanks easier but not included in the cost estimate as this is optional.

A bulk vehicle off-loading station will be required with a tanker connection and delivery compressor. Only one delivery compressor is required because the delivery truck will have its own off-loading pump as a back-up.

Refer to Attachment B for an indicative site layout.

8 Detailed Life Cycle Cost Analysis

8.1 Capital Cost Estimates

As part of the scope of work for this project, a cost estimate was produced for each of the three options for comparison purposes. The cost estimate prepared is considered a Government of Canada Class C estimate for preliminary approval of the project budget, and as a baseline to compare the project against at future milestones. The detailed capital cost estimate can be found in Attachment C.

The cost values have been prepared from the information available at the time of the estimate. The final cost of the project will depend upon the actual labour and material costs, competitive market conditions, implementation schedule and other variable factors. Therefore, the final project costs may vary within the assumed accuracy.

The cost estimates in this section are all based on a new building, including civil, foundation, roads, and chlorine piping to all three injection points.

8.1.1 Capital Cost Estimate Assumptions

Assumptions and Exclusions:

- The estimate assumes the work will be done on a competitive bid basis and the contractor will have a reasonable amount of time to complete the work.
- Internal management costs are not included in this estimate.
- Cost estimates are all based on a common 2017 dollar value.
- All solutions require a new building. The existing chlorination building does not meet current standards and existing system needs to stay online while the new system is constructed. The building foundation will require excavation, back-fill and a retaining structure.
- New pavement required up to the new building for access and delivery.
- All solutions will require a new PLC and control system.
- If SCRD was to purchase major pieces of equipment directly they would pay no tax. However, if equipment is purchased through a contractor, tax may be applied. It was therefore decided to include taxes in the costing at the budgeting stage.

Direct Cost Estimate Methodology:

- A 15% mark-up and 50% installation cost was added to equipment costs.
- Where possible, quantity measurements were completed for components from layout drawings and vendor estimates were obtained for major elements.

Indirect Cost Estimate Methodology:

- Indirect costs carried by the general contractor include general conditions, health & safety, bonding, mobilization, overheads and insurance. Indirect costs are based on percentages of the project subtotal except for mobilization and overheads.
- Internal SCRD indirect project costs are not included in this estimation.

8.1.2 Total Capital Cost Estimate

Table 8, summarizes the total estimated capital cost for each of the three options.

Table 8: Capital Cost Estimate Summary

	Chlorine Gas	0.8% OSHG	Bulk Hypo
Civil works	$ 231,200	$ 253,200	$ 256,600
Structural	$ 375,400	$ 488,950	$ 362,400
Equipment	$ 387,300	$ 337,00	$ 161,200
Pipe, Valves & Fittings	$ 35,750	$ 55,000	$ 57,000
Electrical	$ 75,000	$ 105,000	$ 75,000
Commissioning	$ 32,000	$ 32,000	$ 32,000
Subtotal - Direct Costs	**$ 1,137,000**	**$ 1,271,000**	**$ 944,000**
Equipment Mark-up (15%)	$ 58,100	$ 50,550	$ 24,200
Equipment Installation (50%)	$ 193,650	$ 168,500	$ 80,600
Indirect Costs	$ 210,600	$ 214,600	$ 177,000
Engineering (15%)	$ 240,000	$ 256,000	$ 184,000
Contingency (20%)	$ 368,000	$ 392,000	$ 282,000
Taxes (12% on direct costs only)	$ 136,000	$ 153,000	$ 113,000
TOTAL COST	**$ 2,343,000**	**$ 2,506,000**	**$ 1,805,000**

8.2 Operating and Maintenance Costs

Operating costs were developed based on an average daily dosing rate of 1.4 mg/L. Major values for operational parameters are summarized below:

- Power Cost $0.07/kWh
- Operator Costs $50/hr

Table 9: Chemical Costs by System

Description	Delivered Cost	Cost per kg Equivalent Chlorine
Chlorine Gas (tonner)	$1.20/kg	$1.20/kg Cl
Salt (1000 kg pallet)	$0.89/kg	$2.74/kg Cl
12% Sodium Hypochlorite (Bulk 10,000L)	$0.48/L	$4.00/kg Cl

As summarized in Table 9, delivering chlorine in gaseous form is very cost effective because the concentration of chlorine is very high in this form. The delivery frequency can also be less with gas as it does not have a shelf life and large quantities of chlorine can be stored in a relatively small area.

Table 10, below provide a summary of the estimated operating costs for each of the three options.

Table 10: Estimated Annual Operating & Maintenance Costs

Description	Annual Cost
Chlorine Gas Replacement	
Annual Chlorine Gas (7,100 kg)	$ 8,520
Power (@ 0.07/kWh)	$ 1,700
Chlorine maintenance kits (2)	$ 5,000
Chlorine Sensors	$ 1,000
Labour (2 hrs per week)	$ 5,200
Training/Certification (1 hr per week)	$ 2,600
Cl2 gas offloading (8 hrs / biannual)	$ 800
Total	**$ 24,820**
0.8% Sodium Hypochlorite On-site Generator	
Annual Salt (22,000 kg/yr)	$ 19,600
Power (@ 0.07/kWh)	$ 3,100
PM Kit	$ 1,270
Diaphragm PM kit	$ 622
Valve set kit	$ 528
Cell Cleaning (2)	$ 1,000
Labour (3 hrs per week)	$ 7,800
Salt offloading (4 hrs / biannual)	$ 400
Total	**$ 34,320**
Bulk 12% Sodium Hypochlorite	
Annual Hypochlorite (59,000 L)	$ 28,300
Power (@ 0.07/kWh)	$ 530
Pump tube replacement	$ 6,000
Labour (5 hrs per week)	$ 13,000
Hypo offloading (4 hrs / 60 days)	$ 1,200
Total	**$ 49,030**

Table 11, below lists the costs of key equipment, which will likely be replaced at a given frequency during each systems' life cycle.

Table 11: Estimated Equipment Replacement

Description	Frequency (Yr)	ReplacementCost
Chlorine Gas Replacement		
Chlorinators	20	$ 14,000
Regulator	5	$ 8,200
Dilution Pumps	10	$ 6,000
Pipework	15	$ 7,500
Gas Scrubber	15	$ 163,000
Training & Certification	5	$ 8,000
Gas Scrubber Chemical	5	$ 15,000
0.8% Sodium Hypochlorite On-site Generator		
Electrolytic Cell	7	$ 36,000
Tanks	15	$ 76,748
Dilution Pumps	10	$ 6,000
Pipework	10	$ 25,000
Injection Pumps	10	$ 20,000
Bulk 12% Sodium Hypochlorite		
Tanks	10	$ 88,440
Dilution Pumps	10	$ 6,000
Pipework	10	$ 25,000
Injection Pumps	10	$ 20,000

8.3 Net Present Value

Based on the capital costs provided in Table 8 and the operations costs provided in Table 10 and Table 11, the 30-year net present value (NPV) for the three systems is presented on Figure 2 below.

The inflation rate will vary depending on the type of resource and the relevant industry. The rates used are listed below;

- Municipal Finance Authority (MFA) fixed discount rate 2.88%
- Labour Inflation Rate 3.00%
- ENR Construction Rate 3.02%
- BC Hydro Inflation Rate 5.00%

Interest rates used to convert future costs to present worth value have been deflated at the BC MFA discount rate of 2.88% based on a 10-year rate. The future capital costs (equipment replacement) and chemical costs have been inflated to the past 10 year ENR Construction Price Index which is taken to be 3.02% per year. Both the labour and BC Hydro (electricity) inflation rates have been included to account for their slightly different expected inflation.

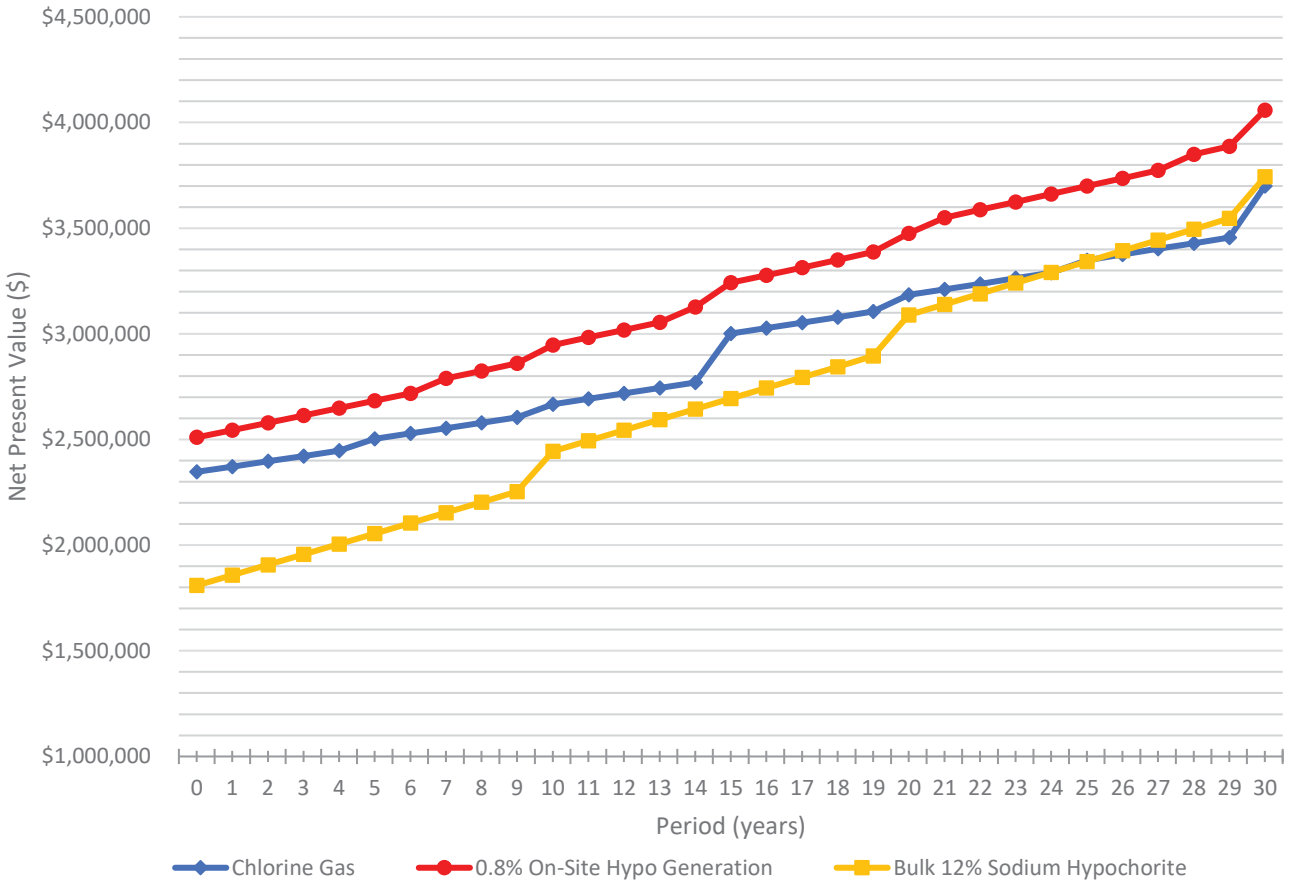


Figure 2: Detailed Life Cycle Cost Graph

Chlorine gas and OSHG start with a higher capital cost but bulk 12% hypochlorite gradually increases over time due to its higher chemical delivery and maintenance cost. Its NPV overtakes chlorine gas at approximately 25 years resulting in chlorine gas having the lowest NPV after 30 years.

However, the NPV's for all three options after 30 years are within approximately 10% of each other. This indicates that this project should not be driven by capital cost alone, because over the full life cycle of the system, the NPVs will likely be very similar. Other criteria such as logistics, maintenance, safety, resiliency, etc. becomes far more important to the final selection. This also emphasises the importance of the operator input collected at the technical workshop conducted with SCRD staff.

9 Evaluation Matrix

An evaluation matrix was created and completed with SCRD staff during a technical workshop. The criteria that were agreed upon in the workshop are listed below into their relevant categories.

Cost (accounts for 30% of score)

- Capital Costs
- Operating and Maintenance Costs
- Potential regional benefit - use NaClO at other WTP's
- Potential to reutilize existing infrastructure

Safety (accounts for 43% of score)

- Annual effort to maintain and certify operations staff
- Annual effort for equipment and emergency response plans
- Requirements to manage off-site risks during transportation
- Extent of regulations, permits and inspection required

Operations & Logistics (accounts for 27% of score)

- Operation intensity
- Chemical transport - reliability & safety
- Chemical storage / stability
- Resiliency / self-sufficiency - impact of failure

Each system was given a score out of 10 for each of the above and Table 12, below gives a summary of the scores for each option. Refer to Attachment D for the full evaluation matrix.

Table 12: Evaluation Matrix Summary

Criteria		Chlorine Gas		0.8% OSHG		Bulk Hypo	
	Weighting	Rank	Score	Rank	Score	Rank	Score
Capital Costs	8	6.4	51.2	5.9	47.2	10.0	80.0
Operating and Maintenance Costs	9	10.0	90.0	8.1	72.5	5.1	45.9
Potential regional benefit - use NaClO at other WTP	7	0.0	0.0	0.0	0.0	10.0	70.0
Potential to reutilize existing infrastructure	2	5.0	10.0	8.0	16.0	5.0	10.0
Annual effort to maintain and certify operations staff	10	1.0	10.0	6.0	60.0	5.0	50.0
Annual effort for equipment and emergency response plans	10	1.0	10.0	10.0	100	7.0	70.0
Requirements to manage off-site risks during transportation	10	1.0	10.0	10.0	100	6.0	60.0
Extent of regulations, permits and inspection required	8	1.0	8.0	6.0	48.0	3.0	24.0
Operation intensity	6	10.0	60.0	5.0	30.0	7.0	42.0
Chemical transport - reliability & safety	4	2.0	8.0	10.0	40.0	2.0	8.0
Chemical storage / stability	7	10.0	70.0	9.0	63.0	6.0	42.0
Resiliency / self-sufficiency - impact of failure	7	5.0	35.0	3.0	21.0	10.0	70.0
TOTAL SCORE (out of 880)		362.2		597.7		571.9	

9.1 Discussion

As discussed in section 8.3, the capital cost should not be the driving factor in this feasibility study as the relative costs become very similar over the life cycle study period.

The bulk 12% hypochlorite system is mechanically very simple and requires a building approximately 65% smaller than the OSHG system. Sodium hypochlorite is also used at other sites in the surrounding area which give it additional regional benefit. These are the main reasons why the bulk 12% hypochlorite solution performs well in the cost criteria even with its highest operating cost.

The chlorine gas has a high concentration of chlorine per kilogram. This means the gas system is the cheapest per kilogram of chlorine and reduces the operators on-site time requirements as the tonner changeover would be less frequent.

Chlorine gas will require far more effort to maintain staff training and to keep the relevant safety procedures up to date. The required safety equipment for a gas system such as a self-contained breathing apparatus, needs to have scheduled recertification. This requires additional time for the administrative and operations team, unlike the other options.

The potential consequences of the chlorine gas system and risk during transport are the highest but are also very unlikely. Chlorine gas is generally treated with a lot more care and the safety procedures are more strictly imposed due to the major consequences in the event of an emergency.

During normal operation, the 12% sodium hypochlorite solution will likely result in more frequent incidences as it does not pose an immediate life threating risk. The OSHG system has least hazardous raw product and chemical solution, resulting the lowest environmental and safety risks both for on-site and for off-site emergency and safety plans and procedures.

The OSHG system only requires the delivery of salt to site which has minimal emergency plans and safety requirements for both on and off site. The main operator task with the OSHG system is the manual loading of the brine tank with salt which is not a chemical related health & safety risk. However, care must be taken when designing this loading system so to allow for a low operator effort and strain when loading the salt.

Both the salt for the OSHG system and the chlorine gas do not significantly degrade over time and are considered very stable. The 0.8% sodium hypochlorite solution from the OSHG unit degrades much slower than the 12% solution due to its much lower concentration.

12% sodium hypochlorite does degrade over time and the amount of usable chlorine present in the solution reduces over time. Factors that increase degradation are;

- High solution concentrations
- Low pH (less than 11)
- High temperatures and sunlight
- Insoluble metals oxides that catalyze the decomposition

10 Temporary System Location

To reduce the initial capital cost of the new chlorination system, Opus evaluated a staged implementation approach for both the on-site generation system and the bulk sodium hypochlorite system. The approach considered initial location of a new chlorination system within the existing WTP. Ultimately, the new chlorination system would be relocated to a separate permanent location, purpose built for the chlorine system, at such time as the next planned WTP upgrade. This staging approach is presented for consideration by SCRD if funding for the new system is not immediately available.

Retrofitting the existing water treatment building to accommodate the new chlorination system essentially removes a large portion of the civil and structural costs. Due to the limited space inside the existing building, the interim stage results in access and operability compromises for both systems and is therefore not recommended as a long-term approach. The operation staff will need to be involved during the design phase to reduce the impact of the retrofitting design of current operations and maintenances tasks.

10.1 Optimized Capital Cost Estimates

Only the bulk 12% hypochlorite and on-site generator options could be considered for retrofitting within the existing WTP. Safety concerns prevent placing a chlorine gas system inside the existing water treatment building, a chlorine system retrofit can not be considered without construction of a new building. Refer to Attachment E for concept layouts of each solution.

The major pieces of equipment for these two designs are;

On-Site 0.8% Sodium Hypochlorite Generation

- 200 mm high bund for spill containment.
- Single 15,000 L storage tank, sized for 3 days at peak demand of 34 kg/day. No second tank to allow maintenance while system is online.
- 0.8% NaClO generation unit and 2,000 L brine tank.
- Dosing pump skid discharging into the two current injection points.
- Duty/standby hydrogen blowers with discharge pipework to outside.

Bulk 12% Sodium Hypochlorite

- 200mm high bund for spill containment.
- Single 15,000 L storage tank, sized to receive a minimum bulk delivery of 10,000 L. No second tank to allow maintenance while system is online.
- Masonry block room (L4.2m x W5.8m x H4m) inside water treatment building. Building to house storage tank, dosing pumps, unloading compressor and be 2 hours fire rated.
- Dosing pump skid discharging into the two current injection points.
- HVAC and ventilation of the new room to outside.
- Unloading compressor and chemical delivery station.

Table 13, below gives the estimated capital costs for each solution to be implemented inside the existing WTP. Refer to Attachment C for the full capital cost estimate break down.

Table 13: Optional Capital Cost Estimate Summary

	0.8% OSHG	Bulk Hypo
Civil works	$ -	$ -
Structural	$ -	$ 67,300
Equipment	$ 249,100	$ 65,100
Pipe, Valves & Fittings	$ 23,500	$ 31,500
Electrical	$ 61,000	$ 75,000
Commissioning	$ 16,000	$ 16,000
Subtotal - Direct Costs	**$ 350,000**	**$ 255,000**
Equipment Mark-up (15%)	$ 37,400	$ 9,800
Equipment Installation (20%)	$ 49,816	$ 13,000
Indirect Costs	$ 55,000	$ 56,200
Engineering	$ 50,000	$ 75,000
Contingency (20%)	$ 108,000	$ 82,000
Taxes (12% on direct costs only)	$ 42,000	$ 31,000
TOTAL COST	**$ 692,000**	**$ 522,000**

Bulk sodium hypochlorite is a very simple system with limited mechanical equipment, however because the system is being retrofitted, the complexity of this system increases. The current water treatment building has not been designed to meet the hazardous chemical requirements. Therefore, a new two hour fire rated masonry block room with a separate HVAC system is required around the tank and pump system. This additional room will partially block the existing access ramp. The OSHG does not require a new structure and therefore its equipment can be arranged to optimize the use of the available area and limit obstruction of the ramp access.

SCRD operations staff have indicated that the heating system is not normally operated in the water treatment building and temperatures below freezing have occurred. To reduce the impact of these low temperatures on the chlorination process it is recommended to heat trace all process pipework to avoid operational issues.

The DAF saturators discharge pipework/valves/blind flanges and control panel will be in close proximity to the proposed system. The valves and blind flanges are periodically used to drain and clean the DAF nozzles, therefore access to these areas must be maintained. A 1.0 meter allowance should be made between any new equipment and this system.

If either retrofit solution was to be implemented, the building drainage layout would need to be confirmed. Any drains within the bunded area would need to be blocked. This is not seen as an issue at this stage and can be confirmed during detailed design.

The onsite generator system maintains the benefit of being less of a health and safety risk compared to bulk sodium hypochlorite, both on and off site. The raw chemical being delivered to site is simple food grade salt which poses negligible environmental risk during transport, whereas 12% sodium hypochlorite is a strong class B oxidant and highly corrosive, it is considered a dangerous good and must follow transport Canada regulations. This also influences on-site safety as a leakage of a strong oxidant in the main treatment building would have a severe impact on operation of the facility.

As a short-term solution, most of the on-site generator components will be reusable at a new location, while the bulk hypochlorite system would be difficult to reuse, i.e. removing the tanks from the two hour fire rated room. Even though the on-site generator system has a higher capital cost, most of the equipment such as the hypochlorite generation unit, hydrogen blowers, brine tank, etc., can be used in a future permanent installation. The re-use of these major pieces of equipment results in lower overall cost for the 0.8% sodium hypochlorite on-site generation system.

10.2 Optimized System's Life Cycle Cost

The life cycle costs for the optimized systems were estimated using the revised capital cost estimate, and the previously established operating and maintenance costs. When evaluating the life cycle costs, plotted in Figure 3, despite a higher capital cost, the on-site generator option is the most cost effective.

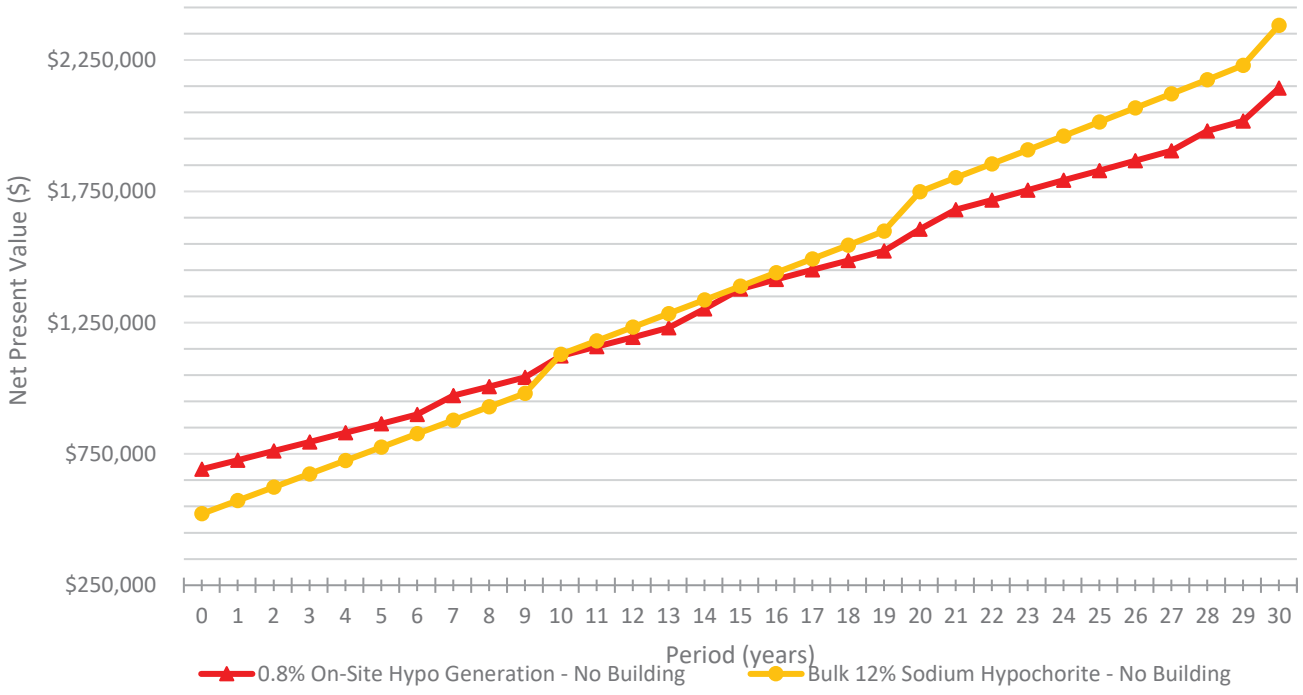


Figure 3: Optimized Life Cycle Costs

11 Conclusion

The investigation to determine a potential upgrade or replacement chlorine disinfection system for the Chapman Creek Water Treatment Plant evaluated five options:

1. Replacement chlorine gas system,
2. On-site sodium hypochlorite (0.8% NaClO & 12% NaClO) generation system;
3. Bulk delivery sodium hypochlorite (12% NaClO) system;
4. Calcium hypochlorite (68% Ca(ClO)2) puck system; and
5. Sodium dichloroisocyanurate (NaDCC) tablet system.

The criteria used to inform the evaluation of potential alternatives were:

- Safety of operators, ancillary contractors (suppliers), and the general public, including:
  - » Potential for environmental impacts during construction, operation, or transportation; and
  - » Emergency response planning, training and certification requirements for operators.
- Cost, both capital cost of new equipment & construction, and operating and maintenance costs.
- Operation & Logistics, including resiliency, operability and operation intensity of the system selected. Logistic concerns with shipping chemicals, and potential for disruption of supply.

These criteria were expanded into an evaluation matrix, which used weighted criteria scores. The option with the highest ranking was the on-site 0.8% sodium hypochlorite generation system, with a score of 598 out of a possible 880. The bulk hypochlorite option was second with a score of 572, and the chlorine gas option was last with a score of 362.

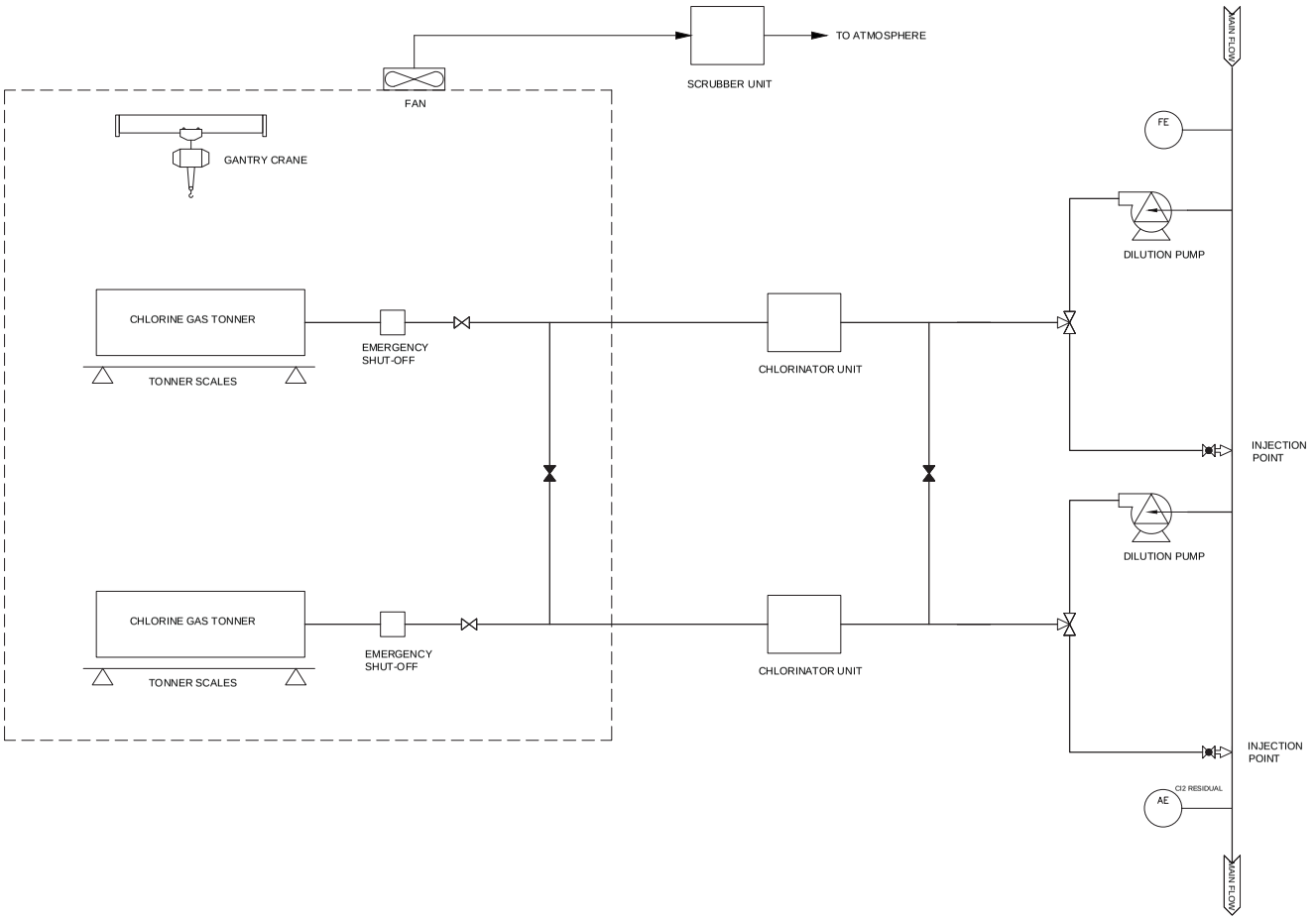
While the 0.8% sodium hypochlorite generation option was the most expensive estimated capital cost, and had the highest life cycle cost, the difference in life cycle cost between the three options was less than 10%, and within the accuracy of the estimates. The use of food grade salt, and production of low concentration chlorine product, with low potential for safety or environmental hazards, resulted in a high score in safety categories. The resiliency of the system and ability to supply raw materials without transporting a hazardous material resulted in a high score in the operations and logistics categories.

A staged implementation approach is possible for both the 0.8% OSHG and bulk 12% sodium hypochlorite systems, and would allow for a lower initial investment. The 0.8% OSHG system being more favourable to this approach due to the greater flexibility for the equipment layout and the ability to repurpose most of the major equipment within a long term solution.

12 Recommendation

The recommended system to proceed with is 0.8% sodium hypochlorite on-site generation, placed in the existing water treatment building as a short term option prior to developing a long term solution as part of the next plant expansion. This option best fulfills the criteria used for evaluation of the options investigated. The use of food grade salt to generate a low concentration sodium hypochlorite is one of the safest alternatives currently available. Particularly advantageous is that there is no need to transport hazardous chemicals. The estimated capital cost of the short term option was $692,000, the 25 year life cycle cost was the lowest of the short term options, and the weighted score in the evaluation matrix was the best of the options investigated.

Attachment A – Concept PFD Drawings



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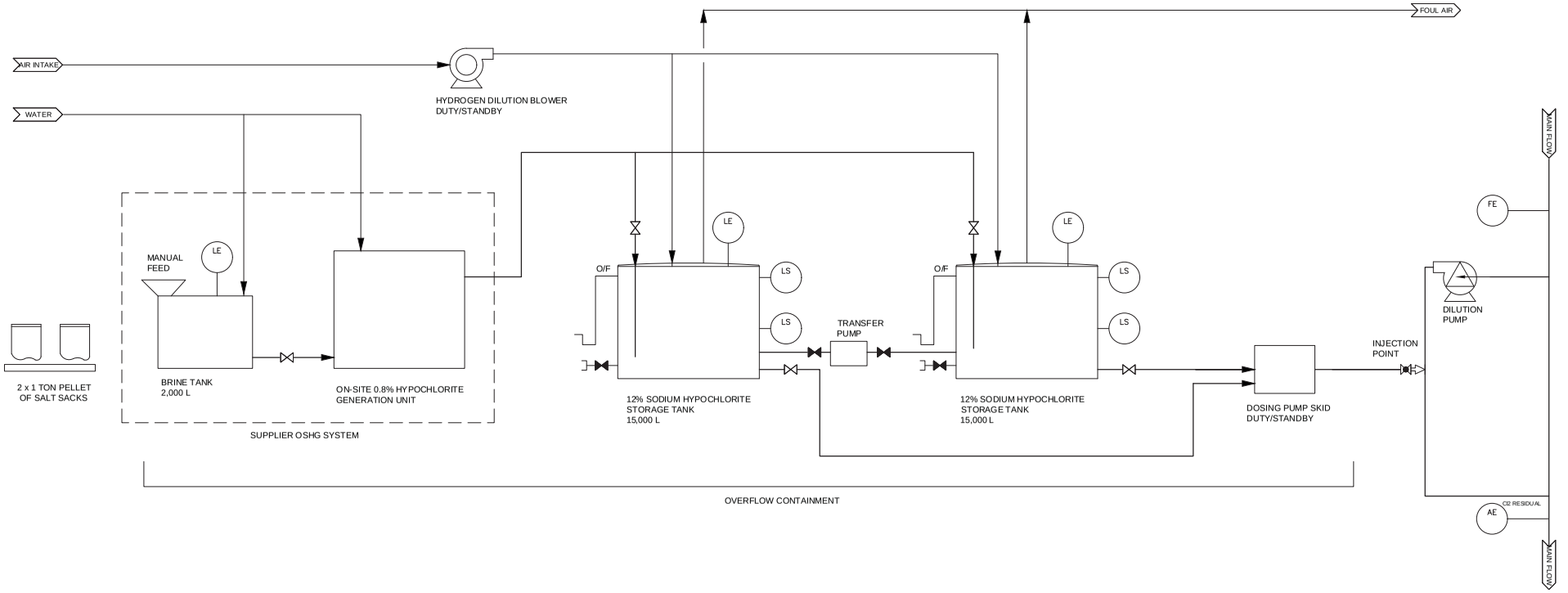
Designed	Approved	Approved Date
J. HITCHINGS	W. BAYLESS	

Drawn	Scales
M. WEEBER	

Project
SUNSHINE COAST REGIONAL DISTRICT
CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
Concept PFD
CHLORINE GAS

Project No.	Sheet. No.	Revision
D-028C4.00	1	



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SUNSHINE COAST REGIONAL DISTRICT
CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
Concept PFD
ON-SITE 0.8% HYPO GENERATION

Project No.	Sheet. No.	Revision
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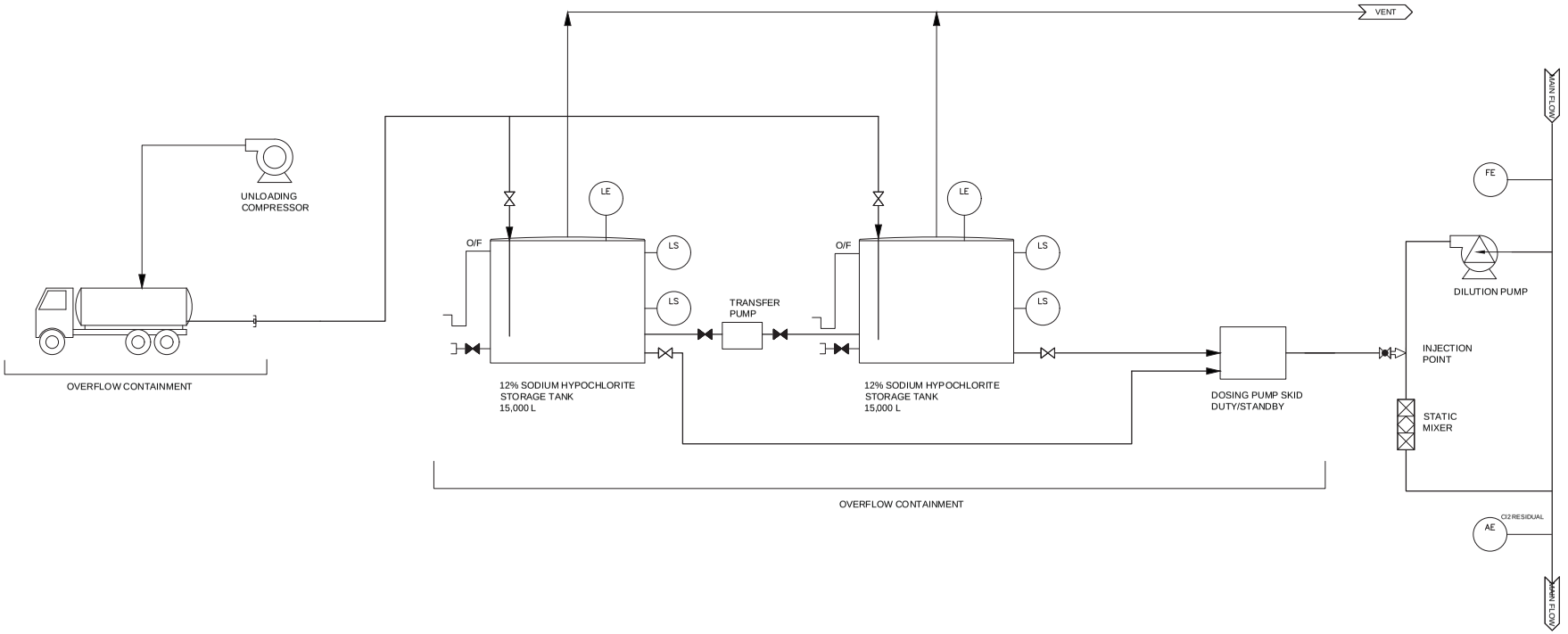

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CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
Concept PFD
BULK 12% SODIUM HYPOCHLORITE

Project No.	Sheet. No.	Revision
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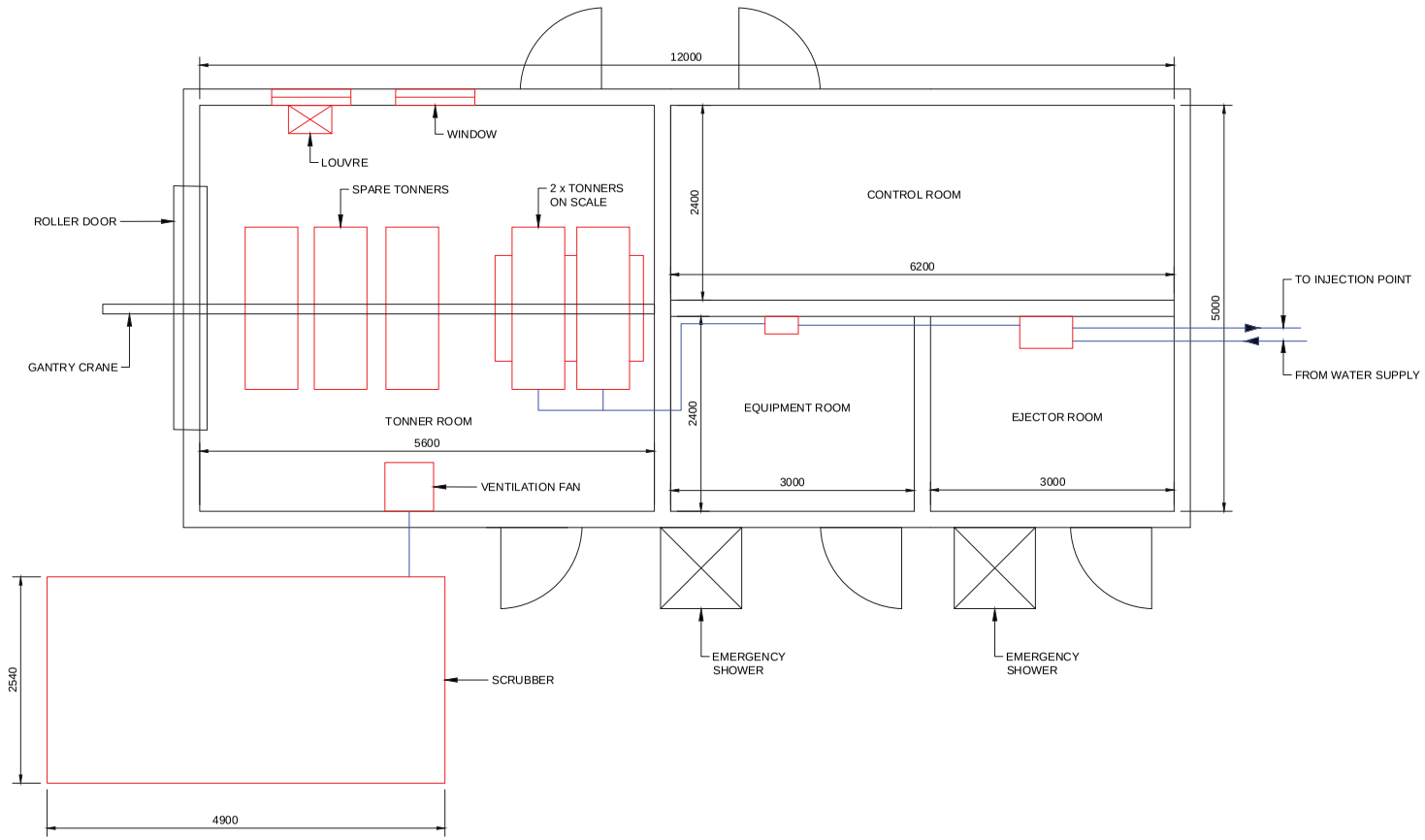
Attachment B – Concept Layout Drawings



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CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
SYSTEM LAYOUT
CHLORINE GAS

Project No.	Sheet. No.	Revision
D-028C4.00	4	

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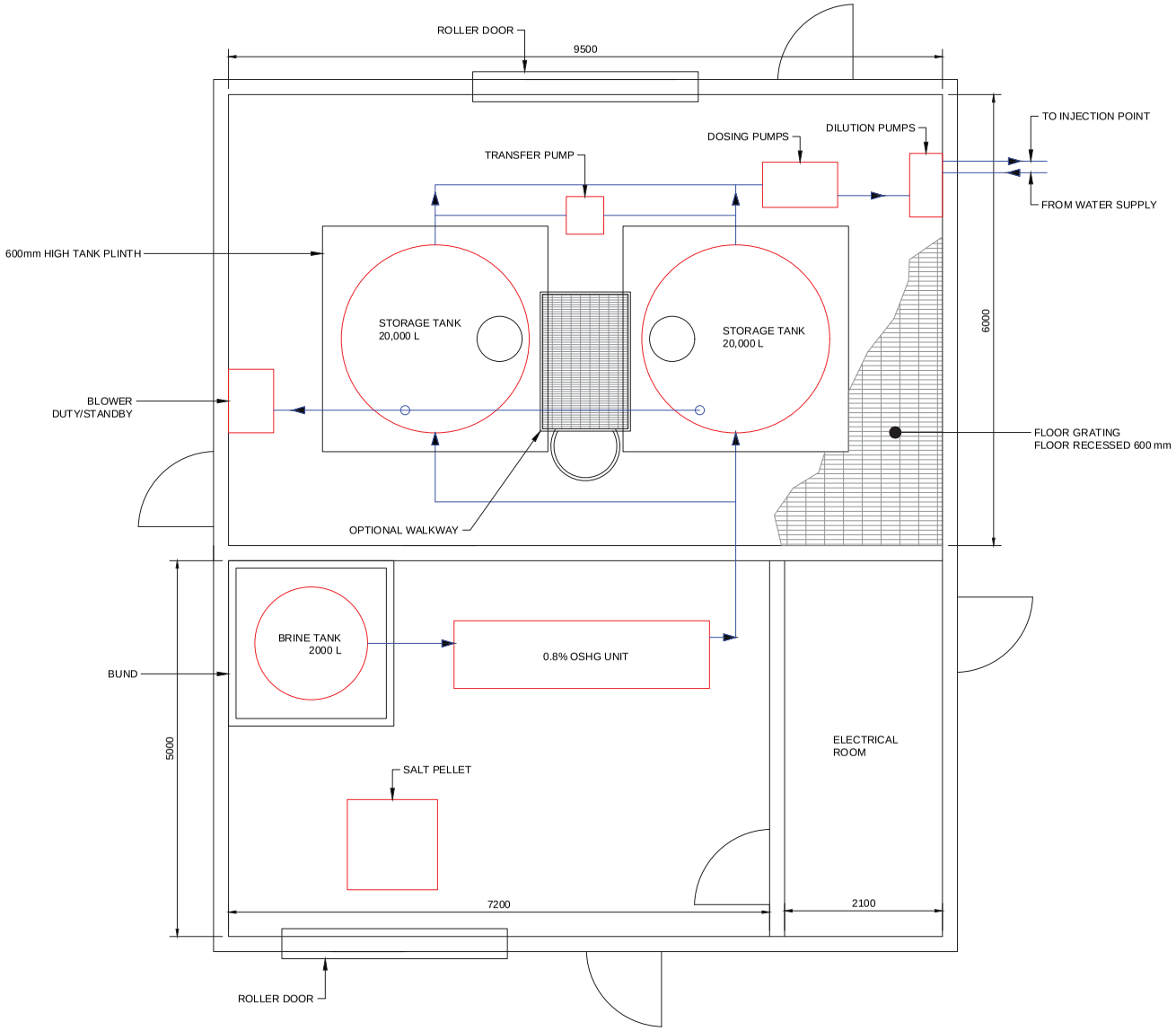

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CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
SYSTEM LAYOUT
ON-SITE 0.8% HYPO GENERATION

Project No.	Sheet. No.	Revision
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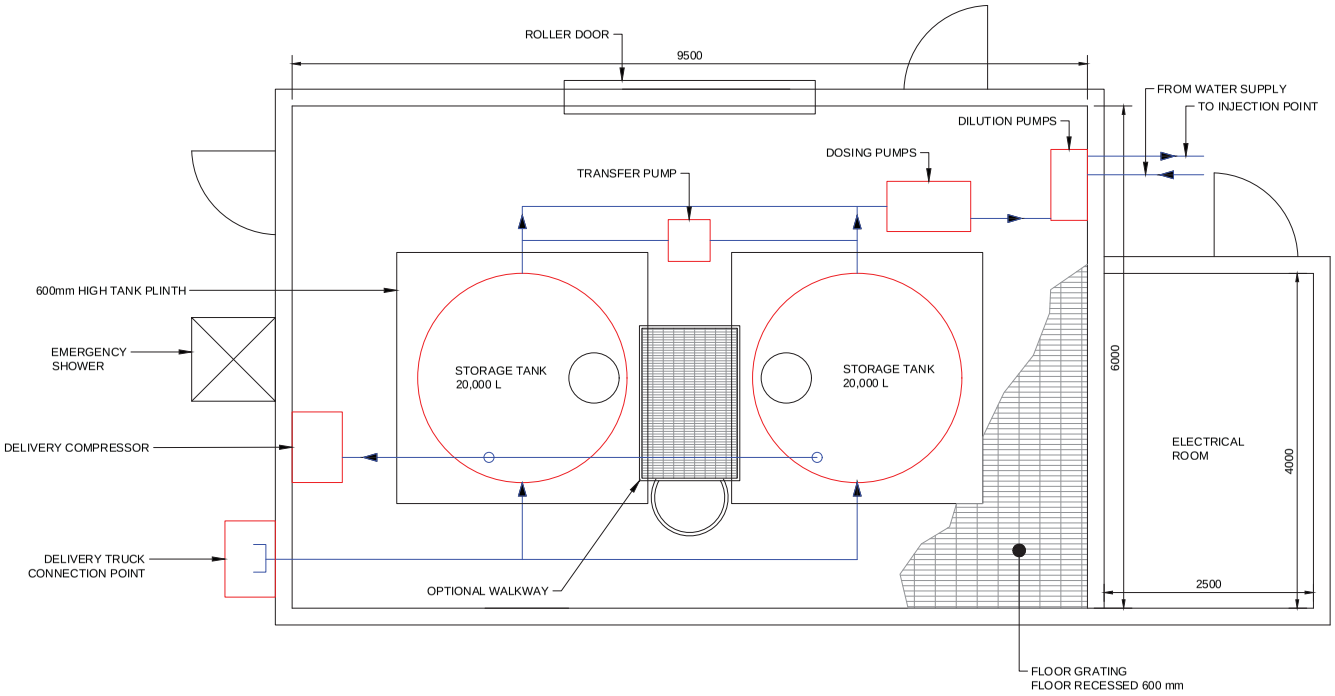

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SUNSHINE COAST REGIONAL DISTRICT
CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
SYSTEM LAYOUT
BULK 12% SODIUM HYPOCHLORITE

Project No.	Sheet. No.	Revision
D-028C4.00	6	

Attachment C – Capital Cost Estimate

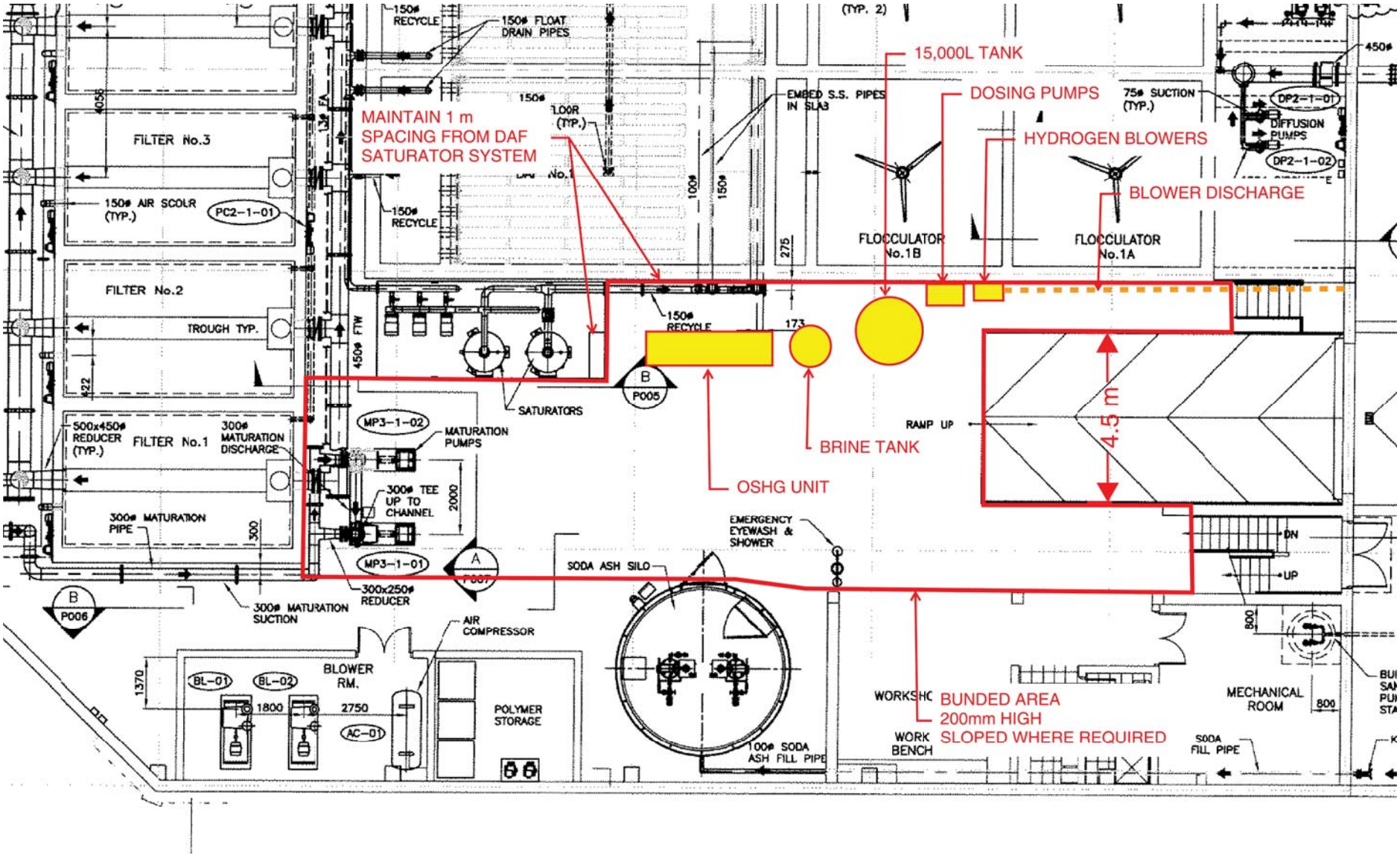
	Chlorine Gas - New Building					On-Site Generator - New Building					Bulk Sodium Hypochlorite (12%) - New Building					On-Site Generator - in WTP					Bulk Sodium Hypochlorite (12%) - in WTP				
	Description	Unit	Qty	Unit Cost	Cost	Description	Unit	Qty	Unit Cost	Cost	Description	Unit	Qty	Unit Cost	Cost	Description	Unit	Qty	Unit Cost	Cost	Description	Unit	Qty	Unit Cost	Cost
1. Civil Works																									
	Excavation	*m3*	*270*	*$ 20*	*$ 5,400*	*Excavation*	*m3*	*472.5*	*$ 20*	*$ 9,450*	*Excavation*	*m3*	*302*	*$ 20*	*$ 6,030*										
	Back Fill (80%)	*m3*	*216*	*$ 35*	*$ 7,560*	*Back Fill (80%)*	*m3*	*378*	*$ 35*	*$ 13,230*	*Back Fill (80%)*	*m3*	*241.2*	*$ 35*	*$ 8,442*										
	New Fill (20%)	*m3*	*43.2*	*$ 100*	*$ 4,320*	*New Fill (20%)*	*m3*	*76*	*$ 100*	*$ 7,560*	*New Fill (20%)*	*m3*	*48*	*$ 100*	*$ 4,824*										
	Building compaction	*m2*	*90*	*$ 30*	*$ 2,700*	*Building compaction*	*m2*	*157.5*	*$ 30*	*$ 4,725*	*Building compaction*	*m2*	*101*	*$ 30*	*$ 3,015*										
	Retaining Wall	*m3*	*31*	*$ 1,000*	*$ 31,000*	*Retaining Wall*	*m3*	*38*	*$ 1,000*	*$ 38,000*	*Retaining Wall*	*m3*	*29*	*$ 1,000*	*$ 29,000*										
	Road foundation	*m2*	*1000*	*$ 60*	*$ 60,000*	*Road foundation*	*m2*	*1000*	*$ 60*	*$ 60,000*	*Road foundation*	*m2*	*1000*	*$ 60*	*$ 60,000*										
	Road asphalt	*m2*	*1000*	*$ 80*	*$ 80,000*	*Road asphalt*	*m2*	*1000*	*$ 80*	*$ 80,000*	*Road asphalt*	*m2*	*1000*	*$ 80*	*$ 80,000*										
	Trench & Pipe: New Building to WTP	*m*	*90*	*$ 350*	*$ 31,500*	*Trench & Pipe: New Building to WTP*	*m*	*90*	*$ 350*	*$ 31,500*	*Trench & Pipe: New Building to WTP*	*m*	*90*	*$ 350*	*$ 31,500*										
	Trench & Pipe: Potable water trench	*m*	*25*	*$ 350*	*$ 8,750*	*Trench & Pipe: Potable water trench*	*m*	*25*	*$ 350*	*$ 8,750*	*Trench & Pipe: Potable water trench*	*m*	*25*	*$ 350*	*$ 8,750*										
											Spill Control at Delivery	*LS*	*1*	*$ 25,000*	*$ 25,000*										
	Subtotal				**$ 231,230**	**Subtotal**				**$ 253,215**	**Subtotal**				**$ 256,561**	**Subtotal**				**$ -**	**Subtotal**				**$ -**
2. Structual & Building Cost																									
	Building Cost	*m2*	*60*	*$ 3,000*	*$ 180,000*	*Building Cost*	*m2*	*105*	*$ 2,500*	*$ 262,500*	*Building Cost*	*m2*	*67*	*$ 2,500*	*$ 167,500*						*Building Cost*	*m3*	*14.5*	*$ 2,000*	*$ 29,000*
	Additional 50% building allowance	*m2*	*30*	*$ 3,000*	*$ 90,000*	*Additional 50% building allowance*	*m2*	*52.5*	*$ 2,500*	*$ 131,250*	*Additional 50% building allowance*	*m2*	*33.5*	*$ 2,500*	*$ 83,750*						*HVAC*	*LS*	*1*	*$ 35,000*	*$ 35,000*
	Building Slab	*m3*	*12*	*$ 1,200*	*$ 14,400*	*Building Slab*	*m3*	*21*	*$ 1,200*	*$ 25,200*	*Building Slab*	*m3*	*13.4*	*$ 1,200*	*$ 16,080*						*Chemical resistant floor coating*	*m2*	*67*	*$ 50*	*$ 3,350*
	Scrubber Slab	*m3*	*5*	*$ 1,200*	*$ 6,000*	*HVAC*	*LS*	*1*	*$ 70,000*	*$ 70,000*	*HVAC*	*LS*	*1*	*$ 70,000*	*$ 70,000*										
	Monorail Crane	*LS*	*1*	*$ 10,000*	*$ 10,000*						*Chemical resistant floor coating*	*m2*	*100.5*	*50*	*$ 5,025*										
	HVAC	*LS*	*1*	*$ 75,000*	*$ 75,000*						*Grating*	*m2*	*80*	*250*	*$ 20,000*										
	Subtotal				**$ 375,400**	**Subtotal**				**$ 488,950**	**Subtotal**				**$ 362,355**	**Subtotal**				**$ -**	**Subtotal**				**$ 67,350**
3. System Cost																									
	Vacuum Regulator	*No.*	*2*	*$ 4,074*	*$ 8,148*	*Metering pump skid*	*LS*	*1*	*$ 25,431*	*$ 25,431*	*Metering pump skid*	*LS*	*1*	*$ 21,004*	*$ 21,004*	*Metering pump skid*	*LS*	*1*	*$ 25,431*	*$ 25,431*	*Metering pump skid*	*LS*	*1*	*$ 21,004*	*$ 21,004*
	Chlorinators	*No.*	*2*	*$ 6,720*	*$ 13,440*	*Storage Tank 20,000L*	*No.*	*2*	*$ 19,187*	*$ 38,374*	*Storage Tank 15,000L*	*No.*	*2*	*$ 22,110*	*$ 44,220*	*Storage Tank 15,000L*	*No.*	*1*	*$ 15,000*	*$ 15,000*	*Storage Tank 15,000L*	*No.*	*1*	*$ 22,110*	*$ 22,110*
	Cyclinder flexible connection	*No.*	*4*	*$ 195*	*$ 796*	*Dilution Pumps*	*No.*	*2*	*$ 6,000*	*$ 12,000*	*Dilution Pumps*	*No.*	*2*	*$ 6,000*	*$ 12,000*	***Generation Unit Includes:***	*LS*	*1*		*$ 208,650*	*Dilution Pumps*	*No.*	*2*	*$ 6,000*	*$ 12,000*
	Multipurpose Ejector	*No.*	*2*	*$ 1,534*	*$ 3,068*	*Transfer Pump*	*No.*	*1*	*$ 7,000*	*$ 7,000*	*Unloading Pump*	*No.*	*1*	*$ 10,000*	*$ 10,000*	*PLC control, HMI & enclousure*	*LS*	*1*	*incl*		*Unloading Pump*	*No.*	*1*	*$ 10,000*	*$ 10,000*
	Automatic shut-off system	*LS*	*1*	*$ 51,948*	*$ 51,948*	*Eyewash Station*	*No.*	*1*	*$ 560*	*$ 560*	*Transfer Pump*	*No.*	*1*	*$ 7,000*	*$ 7,000*	*Titanium electrode*	*LS*	*1*	*incl*						
	Ton container scale	*No.*	*1*	*$ 27,175*	*$ 27,175*	***Generation Unit Incl;***	*LS*	*1*		*$ 208,650*	*Unloading connection system*	*LS*	*1*	*$ 10,000*	*$ 10,000*	*200L brine tank & pump*	*LS*	*1*	*incl*						
	Ton container trunnions	*No.*	*4*	*$ 738*	*$ 2,952*	*PLC control, HMI & enclousure*	*LS*	*1*	*ind*		*Safety Shower*	*No.*	*1*	*$ 12,000*	*$ 12,000*	*Water softner*	*LS*	*1*	*incl*						
	Lifting lever	*No.*	*1*	*$ 1,588*	*$ 1,588*	*Titanium electrode*	*LS*	*1*	*ind*		*Waste water pump station*	*LS*	*1*	*$ 35,000*	*$ 35,000*	*Blowers (duty/standby)*	*LS*	*2*	*incl*						
	Dilution Pumps	*No.*	*2*	*$ 6,000*	*$ 12,000*	*200OL brine tank & pump*	*LS*	*1*	*ind*		*Potable Water pumps*	*LS*	*1*	*$ 10,000*	*$ 10,000*	*Hydrogen Detector*	*LS*	*1*	*incl*						
	Gas scrubber system (2 ton system)	*LS*	*1*	*$ 190,000*	*$ 190,000*	*Water softner*	*LS*	*1*	*ind*							*12kW Water heater*	*LS*	*1*	*incl*						
	Safety Shower	*No.*	*2*	*$ 1,200*	*$ 2,400*	*Blowers (duty/standby)*	*LS*	*2*	*ind*							*Maintenance & spares kit*	*LS*	*1*	*incl*						
	Ventilation Fan 1.5kw	*No.*	*1*	*$ 5,000*	*$ 5,000*	*Hydrogen Detector*	*LS*	*1*	*ind*																
	Ventilation Fan 0.5kw	*No.*	*2*	*$ 2,000*	*$ 4,000*	*12kW Water heater*	*LS*	*1*	*ind*																
	Damper Valve	*No.*	*4*	*$ 2,000*	*$ 8,000*	*Maintenance & spares kit*	*LS*	*1*	*ind*																
	Louvres	*No.*	*4*	*$ 1,000*	*$ 4,000*	*Waste water pump station*	*LS*	*1*	*$ 35,000*	*$ 35,000*															
	Gas Monitor	*No.*	*1*	*$ 2,000*	*$ 2,000*	*Potable Water pumps*	*LS*	*1*	*$ 10,000*	*$ 10,000*															
	Vacuum Gauge	*No.*	*2*	*$ 504*	*$ 1,008*																				
	Automatic chlorine ratameter	*No.*	*2*	*$ 1,288*	*$ 2,576*																				
	Regulator Pressure gauge	*No.*	*2*	*$ 1,104*	*$ 2,208*																				
	Waste water pump station	*LS*	*1*	*$ 35,000*	*$ 35,000*																				
	Potable Water pumps	*LS*	*1*	*$ 10,000*	*$ 10,000*																				
	Subtotal (Vendor Supply)				**$ 387,307**	**Subtotal (Vendor Supply)**				**$ 337,015**	**Subtotal (Vendor Supply)**				**$ 161,224**	**Subtotal (Vendor Supply)**				**$ 249,081**	**Subtotal (Vendor Supply)**				**$ 65,114**
4. Pipe, Valves & Fittings																									
	Gas Pipework (PVC)	*m*	*25*	*$ 150*	*$ 3,750*	*Hypo Piping (PVDF)*	*m*	*30*	*$ 200*	*$ 6,000*	*Hypo Piping (PVDF)*	*m*	*25*	*$ 200*	*$ 5,000*	*Hypo Piping (PVDF)*	*m*	*25*	*$ 200*	*$ 5,000*	*Hypo Piping (PVDF)*	*m*	*25*	*$ 200*	*$ 5,000*
	Services Pipework	*m*	*30*	*$ 200*	*$ 6,000*	*Blower Piping (PVC)*	*m*	*10*	*$ 300*	*$ 3,000*	*Delivery Piping (PVDF)*	*m*	*10*	*$ 200*	*$ 2,000*	*Blower Piping (PVC)*	*m*	*20*	*$ 300*	*$ 6,000*	*Delivery Piping (PVDF)*	*m*	*10*	*$ 200*	*$ 2,000*
	Valves & Fittings (PVC)	*No.*	*20*	*$ 200*	*$ 4,000*	*Services Pipework (PVC)*	*m*	*30*	*$ 200*	*$ 6,000*	*Services Pipework (PVC)*	*m*	*30*	*$ 200*	*$ 6,000*	*Valves & Fittings (PVDF)*	*No.*	*20*	*$ 400*	*$ 8,000*	*Tank Vent Piping (PVC)*	*m*	*20*	*$ 300*	*$ 6,000*
	Ventilation Pipework	*m*	*10*	*$ 300*	*$ 3,000*	*Valves & Fittings (PVDF)*	*No.*	*30*	*$ 400*	*$ 12,000*	*Valves & Fittings(PVDF)*	*No.*	*25*	*$ 400*	*$ 10,000*	*Motorized Actuators*	*No.*	*3*	*$ 1,500*	*$ 4,500*	*Valves & Fittings(PVDF)*	*No.*	*20*	*$ 400*	*$ 8,000*
	WTP PVDF piping to 1st injection point	*m*	*65*	*$ 200*	*$ 13,000*	*WTP (PVDF) piping to 1st injection point*	*m*	*65*	*$ 200*	*$ 13,000*	*De-gassing valves(PVDF)*	*No.*	*4*	*$ 1,500*	*$ 6,000*						*De-gassing valves(PVDF)*	*No.*	*4*	*$ 1,500*	*$ 6,000*
	Drainage pipework (PVC)	*m*	*20*	*$ 300*	*$ 6,000*	*Drainage pipework (PVC)*	*m*	*20*	*$ 300*	*$ 6,000*	*WTP (PVDF) piping to 1st injection point*	*m*	*65*	*$ 200*	*$ 13,000*						*Motorized Actuators*	*No.*	*3*	*$ 1,500*	*$ 4,500*
						Motorized Actuators	*No.*	*6*	*$ 1,500*	*$ 9,000*	*Drainage pipework (PVC)*	*m*	*20*	*$ 300*	*$ 6,000*										
											Motorized Actuators	*No.*	*6*	*$ 1,500*	*$ 9,000*										
	Subtotal				**$ 35,750**	**Subtotal**				**$ 55,000**	**Subtotal**				**$ 57,000**	**Subtotal**				**$ 23,500**	**Subtotal**				**$ 31,500**
5. Electrical																									
	Instrumentation	*LS*	*1*	*$ 18,000*	*$ 18,000*	*Instrumentation*	*LS*	*1*	*$ 25,000*	*$ 25,000*	*Instrumentation*	*LS*	*1*	*$ 14,000*	*$ 14,000*	*Instrumentation*	*LS*	*1*	*$ 14,000*	*$ 14,000*	*Instrumentation*	*LS*	*1*	*$ 14,000*	*$ 14,000*
	PLC	*LS*	*1*	*$ 21,000*	*$ 21,000*	*PLC*	*LS*	*1*	*$ 30,000*	*$ 30,000*	*PLC*	*LS*	*1*	*$ 17,000*	*$ 17,000*	*PLC*	*LS*	*1*	*$ 17,000*	*$ 17,000*	*PLC*	*LS*	*1*	*$ 17,000*	*$ 17,000*
	Distribution	*LS*	*1*	*$ 35,000*	*$ 36,000*	*Distribution*	*LS*	*1*	*$ 50,000*	*$ 50,000*	*Distribution*	*LS*	*1*	*$ 29,000*	*$ 29,000*	*Distribution*	*LS*	*1*	*$ 30,000*	*$ 30,000*	*Distribution*	*LS*	*1*	*$ 29,000*	*$ 29,000*
											Field Control Station (unloading)	*LS*	*1*	*$ 15,000*	*$ 15,000*						*Field Control Station (unloading)*	*LS*	*1*	*$ 15,000*	*$ 15,000*
	Subtotal				**$ 75,000**	**Subtotal**				**$ 105,000**	**Subtotal**				**$ 75,000**	**Subtotal**				**$ 61,000**	**Subtotal**				**$ 75,000**
6. Commissioning	*Commissioning - SCRD Ops & Eng*	*Hr*	*160*	*$ 50*	*$ 8,000*	*Commissioning of new system*	*Hr*	*160*	*$ 50*	*$ 8,000*	*Commissioning of new system*	*Hr*	*160*	*$ 50*	*$ 8,000*	*Commissioning of new system*	*Hr*	*80*	*$ 50*	*$ 4,000*	*Commissioning of new system*	*Hr*	*80*	*$ 50*	*$ 4,000*
	Commissioning - Consultant Eng	*Hr*	*160*	*$ 150*	*$ 24,000*	*Commissioning - Consultant Eng*	*Hr*	*160*	*$ 150*	*$ 24,000*	*Commissioning - Consultant Eng*	*Hr*	*160*	*$ 150*	*$ 24,000*	*Commissioning - Consultant Eng*	*Hr*	*80*	*$ 150*	*$ 12,000*	*Commissioning - Consultant Eng*	*Hr*	*80*	*$ 150*	*$ 12,000*
	Subtotal				**$ 32,000**	**Subtotal**				**$ 32,000**	**Subtotal**				**$ 32,000**	**Subtotal**				**$ 16,000**	**Subtotal**				**$ 16,000**
Subtotal Direct Costs					**$ 1,137,000**					**$ 1,271,000**					**$ 944,000**					**$ 350,000**				**$ 255,000**
	Equipment Mark-up		15%		$ 58,096.05	Equipment Mark-up		15%		$ 50,552	Equipment Mark-up		15%		$ 24,184	Equipment Mark-up		15%		$ 37,362	Equipment Mark-up		15%		$ 9,767
	Equipment Installation		50%		$ 193,653.50	Equipment Installation		50%		$ 168,508	Equipment Installation		50%		$ 80,612	Equipment Installation		20%		$ 49,816	Equipment Installation		20%		$ 13,023
	Equipment Total				**$ 1,388,750**	**Equipment Total**				**$ 1,490,060**	**Equipment Total**				**$ 1,048,796**	**Equipment Total**				**$ 437,178**	**Equipment Total**				**$ 277,790**
	Mobilization / Demobilization		*LS*	*1*	*$ 25,000*	*$ 25,000*		*LS*	*1*	*$ 25,000*	*$ 25,000*		*LS*	*1*	*$ 25,000*	*$ 25,000*		*LS*	*1*	*$ 15,000*	*$ 15,000*		*LS*	*1*	*$ 15,000*	*$ 15,000*
	Performance and Labour & Material Bonds		*%*	*2%*		$ 27,800		*%*	*2%*		$ 29,800		*%*	*2%*		$ 21,000		*%*	*2%*		$ 8,700		*%*	*2%*		$ 5,600
	Insurance		*%*	*1%*		$ 13,900		*%*	*1%*		$ 14,900		*%*	*1%*		$ 10,500		*%*	*1%*		$ 4,400		*%*	*1%*		$ 2,800
	Health and Safety		*%*	*1%*		$ 13,900		*%*	*1%*		$ 14,900		*%*	*1%*		$ 10,500		*%*	*1%*		$ 4,400		*%*	*1%*		$ 2,800
	Contstruction overhead / indirects		*days*	*130*	*$ 1,000.00*	$ 130,000		*days*	*130*	*$ 1,000.00*	$ 130,000		*days*	*110*	*$ 1,000.00*	$ 110,000		*days*	*45*	*$ 500*	$ 22,500		*days*	*60*	*$ 500*	$ 30,000
Subtotal Indirect Costs					**$ 210,600**					**$ 214,600**					**$ 177,000**					**$ 55,000**				**$ 56,200**
Engineering (15%)				15%		$ 240,000			15%		$ 256,000			15%		$ 184,000		LS	*1*	*$ 50,000*	$ 50,000		LS	*1*	*$ 75,000*	$ 75,000
Contingency (20%)				20%		$ 368,000			20%		$ 392,000			20%		$ 282,000			20%		$ 108,000			20%		$ 82,000
Taxes (12% on direct cost only)				12%		$ 136,000			12%		$ 153,000			12%		$ 113,000			12%		$ 42,000			12%		$ 31,000
TOTAL COST					**$ 2,343,000**					**$ 2,506,000**					**$ 1,805,000**					**$ 692,000**				**$ 522,000**
Percent more than lowest cost					30%					39%					0%										

Attachment D – Evaluation Matrix

Criteria Type	Criteria Type % of total Weight	Criteria	Weighting	% of total	Chlorine Gas System		0.8% Hypochlorite Generator		Bulk 12% Sodium Hypochlorite	
					Score out of 10*	Weighted Score	Score out of 10*	Weighted Score	Score out of 10*	Weighted Score
Cost	30%	Capital Costs	8	9%	6.4	51.2	5.9	47.2	10.0	80.0
		Operating and Maintenance Costs	9	10%	10.0	90.0	8.1	72.5	5.1	45.9
		Potential regional benefit - use NaClO at other WTP	7	8%	0.0	0.0	0.0	0.0	10.0	70.0
		Potential to reutilize existing infrastructure	2	2%	5.0	10.0	8.0	16.0	5.0	10.0
Safety	43%	Annual effort to maintain and certify operations staff	10	11%	1.0	10.0	6.0	60.0	5.0	50.0
		Annual effort for equipment and emergency response plans	10	11%	1.0	10.0	10.0	100.0	7.0	70.0
		Requirements to manage off-site risks during transportation	10	11%	1.0	10.0	10.0	100.0	6.0	60.0
		Extent of regulations, permits and inspection required	8	9%	1.0	8.0	6.0	48.0	3.0	24.0
Operations & Logistics	27%	Operation intensity	6	7%	10.0	60.0	5.0	30.0	7.0	42.0
		Chemical transport - reliability & safety	4	5%	2.0	8.0	10.0	40.0	2.0	8.0
		Chemical storage / stability	7	8%	10.0	70.0	9.0	63.0	6.0	42.0
		Resiliency / self-sufficiency - impact of failure	7	8%	5.0	35.0	3.0	21.0	10.0	70.0
		TOTAL	**88**	**100%**		**362.2**		**597.7**		**571.9**
			880			41%		68%		65%

*Score of 10 is best, score of 0 is worst

Attachment E – Short Term Concept Layout Drawings



DRAWING IN PROGRESS

PLOTTED ON 2017-11-30 AT 11:44 AM

CONCEPT

Revision	Amendment	Approved	Revision Date

OPUS
North Vancouver Office
604-990-4800
210-889 Harbourside Drive
North Vancouver BC
V7P 3S1, Canada

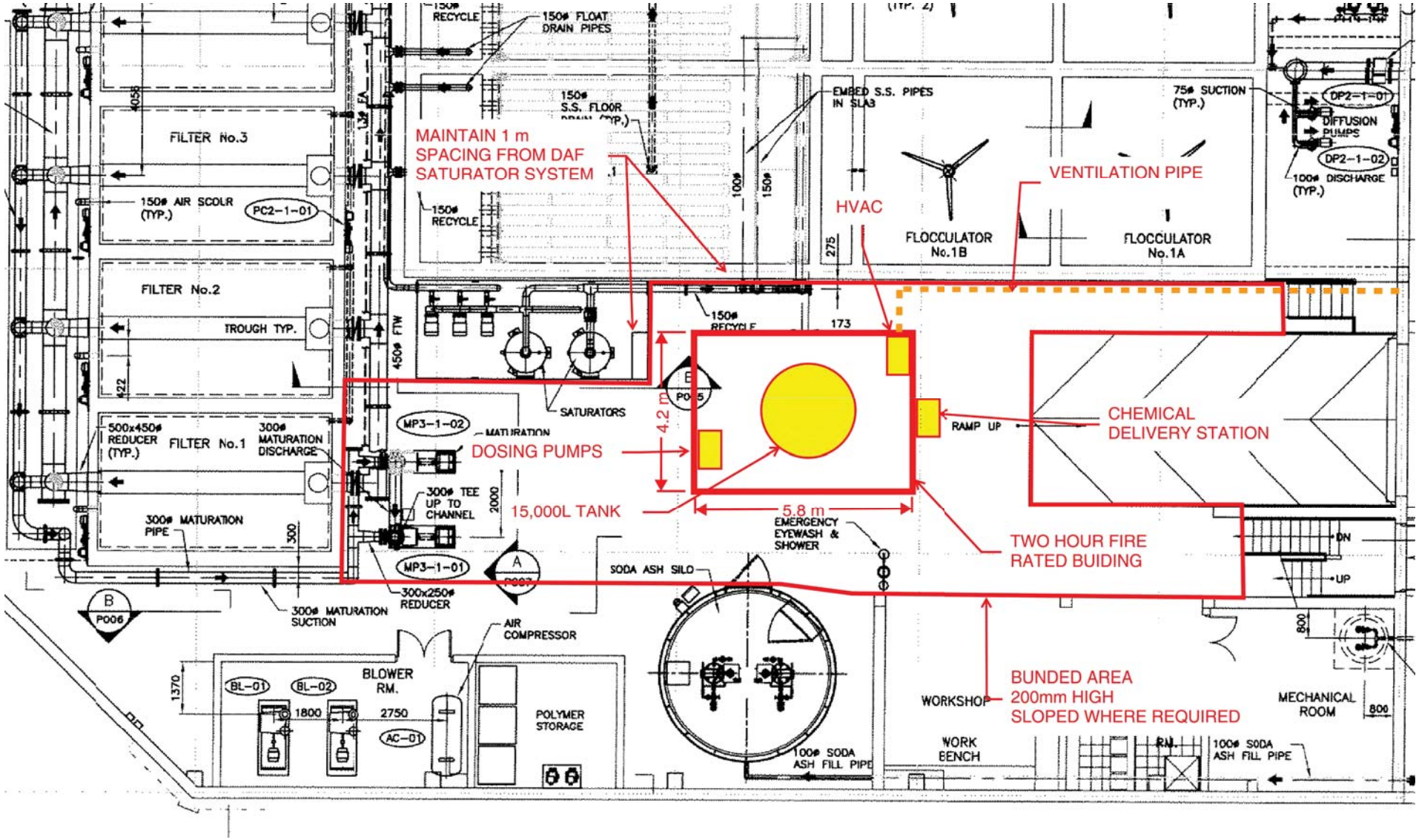
Designed	Approved	Approved Date
J. HITCHINGS	W. BAYLESS	

Drawn	Scales
M. WEEBER	

Project: SUNSHINE COAST REGIONAL DISTRICT
CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet: SYSTEM LAYOUT - SHORT TERM SOLUTION
ON-SITE 0.8% HYPO GENERATION

Project No.	Sheet No.	Revision
D-028C4.00	7	



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Drawn	Scales
M. WEEBER	

Project
SUNSHINE COAST REGIONAL DISTRICT
CHAPMAN CREEK WTP
CHLORINE FEASIBILITY STUDY

Sheet
SYSTEM LAYOUT - SHORT TERM SOLUTION
BULK 12% SODIUM HYPOCHLORITE

Project No.	Sheet No.	Revision
D-028C4.00	8	

Opus International Consultants (Canada) Limited
210-889 Harbourside Drive
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SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee Meeting – December 21, 2017

AUTHOR: Janette Loveys, Chief Administrative Officer

SUBJECT: **REGIONAL WATER PLAN TIMELINE**

RECOMMENDATION(S)

THAT the report titled Regional Water Plan Timeline be received.

BACKGROUND

Staff recognize that there is significant interest in the community water supply and have assembled a timeline for the Regional Water Plan for Committee's information.

The Sunshine Coast Regional District (SCRD) Board adopted the Comprehensive Regional Water Plan (CRWP) on June 13, 2013.

The purpose of this report is to provide a chronological history of the processes and decisions related to the CRWP and the Chapman Lake Watershed.

DISCUSSION

Staff have prepared a timeline that outlines the description of the process, any Board Resolutions or direction and the associated date. The timeline, included as Attachment A, begins when the CRWP was presented at budget in 2013 and continues until November 28, 2017.

With the Board's approval, staff continue to implement the projects in the CRWP with respect to community water supply:

- Chapman Lake Expansion Project
- Water Meter Program
- Groundwater Investigation
- Communication/Outreach and Education

STRATEGIC PLAN AND RELATED POLICIES

The CRWP supports the following Strategic Priority:

- Strategic Priority: Embed Environmental Leadership through the responsible management of the regions' water supply.

CONCLUSION

The Comprehensive Regional Water Plan was adopted in 2013.

Staff prepared a timeline to provide a chronological history of the processes and decisions made to implement the CRWP and the Chapman Lake Watershed.

This report is provided for information.

ATTACHMENT:

A. Regional Water Plan Timeline

Reviewed by:			
Manager		Finance	
GM		Legislative	
CAO	X-J. Loveys	Other	

Sunshine Coast Regional District
Regional Water Plan Timeline

Date	Description	Board Resolution/Direction or Outcome Decision History
2013 R3 Budget	Chapman Drought Mitigation Options Study budget approved.	
May 2, 2013	Purchase Order issued to Opus Dayton Knight for Drought Mitigations Option Study.	
June 13, 2013	Comprehensive Regional Water Plan Consultation Report received and CRWP adopted. Res. 261/13 Rec. 8. - CRWP recommends "floating pump station or alternative system" for short term supply option for additional 3 metre drawdown. Targets 2015 construction.	261/13 No. 8 THAT the Sustainability and Outreach Coordinator and GM, Infrastructure Services' report entitled "Draft Comprehensive Regional Water Plan – Report on Public Consultation" be received; AND THAT the Comprehensive Regional Water Plan be amended to include a statement on the impact of Climate Variability on water supply; AND FURTHER THAT the Comprehensive Regional Water Plan be adopted as amended.
Sep. 4, 2014	Tetrahedron Alliance and SCCA delegation to ISC requesting SCRD to pursue other options instead of drawing down on Chapman Lake further.	
Sep. 11, 2014	Res. 456/14. Board requests staff to address Tet. Alliance and SCCA concerns in Drought Mitigation Study report. Requests further discussion at October 2014 ISC.	THAT Infrastructure Services Committee recommendation No. 2 of September 4, 2014 be referred back to the Infrastructure Services Committee for discussion, as follows: THAT the forthcoming report presenting options for Chapman Lake drawdown address concerns communicated in the presentation/ submissions from George Smith, Tetrahedron Alliance, and Jason Herz, Sunshine Coast Conservation Association.
Oct. 2, 2014	Staff report bringing back Res 456/14 to ISC for further discussion.	
Oct. 9. 2014	Res. 503/14 Referring Chapman Lake drawdown options to November Joint Watershed Management Advisory Committee (JWMCA) for discussion. Res. 504/14 Directing staff to incorporate concerns raised by Tet. Alliance and SCCA in the Drought Mitigation Study report.	

Date	Description	Board Resolution/Direction or Outcome Decision History
Nov. 3, 2014	JWMAC meeting. Discussed Chapman Lake drawdown options. Directed GM, Infrastructure Services to present options to SIB Rights and Titles meeting on November 5, 2014.	
Nov. 21, 2014	Letter from SIB to Chair Nohr requesting further study on lake drawdown environmental impacts.	
Jan. 22, 2015	Res. 048/15 Directing the drought mitigation project scope and budget to 2016 budget process.	048/15 THAT a revised Drought Mitigation Project scope and budget estimate be brought forward to a future Infrastructure Services Committee meeting for 2016 budget consideration; AND THAT the Sechelt Indian Band be engaged with respect to land acquisition discussions for an engineered lake within the Lehigh Construction Aggregates mining site.
July 23, 2015	Board report on "Water Supply Update". Drought concerns raised with supply at 67% capacity. Potential to deploy emergency siphon noted if drought continues into fall. Farmer delegation requesting exemption from Stage 4 restrictions. Res. 306/15 exempting recognized commercial farms from Stage 4 restrictions.	306/15 THAT local food producers with farm class status be granted an exemption from the Stage 4 water use restrictions contained in the Drought Management Plan for 2015 on the condition that a water meter is in place.
Aug. 30, 2015	Rains arrive.	
Sep. 1, 2015	Chapman Lake full.	
Sep. 3, 2015	Staff report to ISC on Chapman Lake Drought Mitigation Options. Written prior to rains when supply was at 32% capacity. Noted FLNRO approval for additional 1 million cubic metres of water based on 5 metre additional drawdown. Short term drawdown options presented based on cost to drawdown additional 3 metres.	347/15 No. 1 Drought Mitigation Options THAT the General Manager Infrastructure Services' report dated August 25, 2015 titled Drought Mitigation Options be received; AND THAT the SCRD move forward with the design and approval process for the Deepen Channel option, recognizing that the system will only be utilized during periods of drought and until the long term source development projects specified in the Comprehensive Regional Water Plan are constructed;

Date	Description	Board Resolution/Direction or Outcome Decision History
		AND FURTHER THAT the design, engineering and environmental impact assessment of the Deepen Channel option be presented to the Board for consideration. 348/15 No. 2 Secondary Water Sources THAT the timeline in the Comprehensive Regional Water Plan be expedited regarding long term water supply sources including the following: Engineered lake; aquifers; Sakinaw Lake. (Board Sep 10/15)
Sep. 10, 2015	Res. 347/15 selecting deepen channel option and directing staff to proceed with design and approval process.	AND THAT the SCRD move forward with the design and approval process for the Deepen Channel option, recognizing that the system will only be utilized during periods of drought and until the long term source development projects specified in the Comprehensive Regional Water Plan are constructed; AND FURTHER THAT the design, engineering and environmental impact assessment of the Deepen Channel option be presented to the Board for consideration.
Sept 22, 2015	UBCM meeting with Honourable Steve Thomson, Minister of Forests, Lands and Natural Resource Operations regarding Watershed Protection.	Briefing note in part: That the Province reconsider the decision to not establish an AVICC Private Managed Forest Land Stakeholder Working Group, and that the water quality interests of licensed waterworks be strengthened in the Private Managed Forest Land Council Regulation by requiring PMFL owners to consult with Local Government, First Nations and any affected water licensees during the development of harvesting plans on PMFL, and that notice be provided to Local Government, First Nations and other affected water licensees prior to any harvesting activity
Oct. 23, 2015	RFP 15 248 issued for Engineering Services based on 5 metre additional drawdown to align with previous environmental	

Date	Description	Board Resolution/Direction or Outcome Decision History
	assessment report and temporary approvals. RFP closed Dec. 3, 2015.	
Jan. 14, 2016	ISC report recommending RFP award to AECOM. Report notes 5 metre drawdown.	021/16 THAT Chapman Lake Water Supply Expansion RFP 15 248 consulting services contract be awarded to AECOM with a value of $503,490 including taxes, to be funded through Regional Water [370] reserves; AND THAT the reserves be replenished once the project borrowing is complete; AND FURTHER THAT the 2016 Financial Plan be amended accordingly.
March 24, 2016	Budget Proposal – Regional Water Service [370] approved for Chapman Lake Access Expansion through long term debt financing.	154/16 THAT the report titled "Regional Water Service [370] – 2016 R2 Budget Proposal" be received; AND THAT the following budget proposal be approved and incorporated into the 2016 Budget: • Budget Proposal 2 – Chapman Lake Access Expansion, $4,225,000 funded through Long Term Debt Financing Process.
April 13, 2016	SCRD applied for an amendment to its Chapman Lake Park Use Permit (PUP) and Water License Amendment on April 18/16 to allow the installation of a gravity fed withdrawal system to provide additional water supply from Chapman Lake	
April 18, 2016	Water License Amendment (see above) received.	
May 1, 2016	Stage 1 water use restrictions called in accordance with DMP and standard practice.	

Date	Description	Board Resolution/Direction or Outcome Decision History
May 2, 2016	SCRD was served notice from Owen Bird Law Corporation on behalf of client AJB Investments Ltd. Exercising Clause 5 of the Agreement dated Oct 21, 1986 which constitutes notice to the SCRD to relocate the road within 3 months and at SCRD expense	
May 5, 2016	Staff report to ISC on Water Supply Status Update	
May 5, 2016	Chapman Lake Access Expansion Project – AAP authorization – Stage 2 called once Chapman Lake dam is opened.	Board Resolution 183/16
May 5, 2016	Staff report to ISC re: Installation of Access Gates in Drinking Water Watersheds	Received for information 181/16 No.5
May 5, 2016	Staff report to ISC re: Agricultural Water Use Study – Upland Consulting was retained to carry on an agriculture water use study in 2014-2015	Received for information 181/16 No. 6
June 6, 2016	Letter from BC Parks requiring further field investigation work in order to fully adjudicate the proposal and issue the PUP amendment	Referenced in July 7, 2016 staff report to ISC with resolution 297/16 No. 1 receiving report.
June 9, 2016	AECOM presentation to Special ISC – presented the Chapman Lake Water Supply Expansion Project overview and status	Received for information
June 20, 2016	FLNRO formally requested that a new water license application be submitted along with an Environmental Flow Needs study as part of the Chapman Lake Water Supply Expansion Project.	
July 7, 2016	Staff report to ISC - Chapman Lake Water Supply Expansion Budget Update – Requesting that the financial plan be amended to include the additional environmental assessment work related to the Expansion project of $125,425 to be funded through debt	Board Resolution 297/16 No. 1
July 7, 2016	Staff report to ISC re: Chapman Lake Water Supply Siphon Update requesting staff to proceed with siphon to maintain	298/16 No. 2 THAT the report titled “Chapman Lake Water Supply Siphon Update” be received for information;

Date	Description	Board Resolution/Direction or Outcome Decision History
	water supply capacity at Stage 3 levels and report back on final siphon costs	AND THAT staff proceed with the Chapman Lake Water Supply Siphon installation if required to maintain water supply capacity at Stage 3 levels; AND FURTHER THAT staff provide a future report on the final siphon costs and Financial Plan impacts should the siphon be installed as a response to 2016 water restrictions and calling of Stage 3 as per the Drought Management Plan
July 7, 2016	IC ISC report re: Chapman Creek Watershed Access.	THAT the Board of the SCRD confirms and authorizes its staff and agents to take all steps required or determined to be advisable to undertake the process to expropriate such lands that are located in and near the Chapman Creek Watershed as may be required for the purpose of securing appropriate access…
July 25, 2016	Stage 2 water restrictions called	
Aug 26, 2016	Stage 3 water restrictions called	
Sept 2, 2016	Stage 2 – Rains arrive.	
Sept 27, 2016	UBCM meeting with Honourable Mary Polak, Minster of Environment regarding Chapman Water Supply Expansion Project	Briefing note in part: The SCRD requests that the Provincial approval process be expedited in order to permit construction of the necessary infrastructure to meet summer 2017 water needs.
Oct 4, 2016	Chapman Lake full.	
Oct 20, 2016	Staff report on Universal Water metering Program Schedule and Update to ISC. The Universal Metering Program is moving ahead in a phased approach. North and South Pender Harbour is at the leak identification stage and preparing for a rate study. Meters are currently being installed in the Electoral Areas and should be completed in fall 2017. Meter installations in the District of Sechelt will commence in 2018.	289/16 Water Metering THAT the Universal Water Metering Phase 2 - Rural Areas meter supply and installation contract be awarded to Neptune Technology Group (Canada) Ltd. in the amount of $4,961,935; AND THAT the 2016 Financial Plan be amended to increase the Universal Water Metering Phase 2 – Rural Areas project to a total cost of $5,861,935 with additional funding of

Date	Description	Board Resolution/Direction or Outcome Decision History
		$316,935 from Capital Reserves. (from the June 23/16 Board meeting)
Nov 17, 2016	2016 Water Conservation Summary staff report to ISC	Received 431/16 No. 2
Nov 17, 2016	Drought Management Plan Update staff report to ISC requesting to Amend Bylaw 422 to incorporate changes to DMP	431/16 No. 3 Drought Management Plan Update THAT the report titled Drought Management Plan Review be received; AND THAT the updated Drought Management Plan be adopted as presented; AND THAT staff proceed with the amendment to Bylaw 422 to incorporate the changes to the Drought Management Plan; AND THAT consultation with businesses affected by the proposed amendments be engaged in dialogue prior to bringing the Bylaw 422 amendment forward; AND FURTHER THAT an escalated watering fine schedule and the temporary new lawn permit fee be increased for Bylaw 422 and be brought forward for Board consideration.
Nov 17, 2016	IC ISC report re: Chapman Creek Watershed Expropriation Update – Letter from Ministry of Justice included. Province favoured with SCRD and closed file.	
Dec 15, 2016	SCRD awarded Contract No. 16 272 to Waterline Resources Inc. to provide hydrogeological services and subsequent report pertaining to the Groundwater Investigation study.	
Feb 16, 2017	Staff report to ISC regarding Water Demand Management Rebate Programs, i.e., Washing Machine, Toilet Rebate, Rainwater Harvesting	081/17 February 16, Recommendation No. 2 AND THAT the Toilet Rebate Program's expiry at the end of 2017 be communicated to the community; AND THAT staff report in the third quarter of 2017 on Washing Machine and Rainwater Harvesting Rebate Programs which include diverse approaches such as cisterns, cast in

Date	Description	Board Resolution/Direction or Outcome Decision History
		place concrete ponds and hardware and if deemed feasible presented as 2018 budget proposals.
Feb 16, 2017	Chapman Lake Water Supply Expansion Project Environmental Assessment Report. AECOM Environmental Assessment report attached	081/17 No. 1 Chapman Lake Water Supply Expansion Project Environmental Assessment Report THAT the report titled Chapman Lake Water Supply Expansion Project Environmental Assessment Report be received; AND THAT a report on the 2015 and 2016 Chapman Creek flow measurement data from below the intake be brought to a future Infrastructure Services Committee meeting
Mar 6, 2017	Letter rec'd from J. Aikman, Regional Director, MoE regarding PUP#102714 Amendment Application The letter notes: that "[w]here regional water supply improvements are proposed, an impact assessment and comprehensive pubic consultation process will be developed."	Received 131/17 No. 16
March 16, 2017	Chapman Creek Summer Flow Analysis staff report ISC: The minimum recorded summer flow in Chapman Creek met the 200 L/s target 86% of the time in 2015 and 98% of the time in 2016. The daily average flow for the days that didn't meet 200 L/s was 195 L/s for both 2015 and 2016.	Received 152/17 No. 2
April 20, 2017	Pender Harbour Private Side Water Leaks Status Update staff report to ISC 17.5% of properties have water consumption patterns that indicate leaks. Estimated savings from repaired leaks so far is 137.4m3 per day in NP	Received 152/17 No. 4
April 20, 2017	Chapman Lake Expansion Report – Environmental Assessment staff report to ISC This report includes the respective comments and responses in summary sections related to the Environmental Assessment Report	Received 152/17 No. 1

Date	Description	Board Resolution/Direction or Outcome Decision History
May 1, 2017	Stage 1 Water restriction called	
May 18, 2017	Siphon Installation and Operation Authorization staff report to ISC With the delay in the regulatory approval process for the Chapman Lake Water Supply Expansion project, the SCRD may have to install a temporary siphon system in order to maintain adequate capacity for environmental flows and community needs during a prolonged drought. The siphon material is purchased and available for installation should the need arise. Staff are continuously monitoring flow conditions in Chapman Creek, Chapman Lake, Edwards Lake, as well as climate conditions and projections, and water demands to determine the optimal time to install the siphon.	175/17 No. 2 Siphon Installation and Operation Authorization THAT the report titled Siphon Installation and Operation Authorization be received; AND THAT the General Manager, Infrastructure Services / Regional Engineer or their designate have the authority to install and operate the Chapman Lake Water Supply Siphon when deemed necessary; AND THAT should the siphon be installed and operated, that staff be approved to expend the required funds to install and operate the siphon; AND FURTHER THAT staff will provide a report on the final siphon costs and Financial Plan impacts.
May 18, 2017	Bylaw 422 Review (Drought Management Plan) staff report to ISC Staff consulted with a number of businesses that expressed concerns about the negative impact of water restrictions on their operations. Some of the impacts can be mitigated by early and ongoing communication about the water supply situation. An amendment to the Drought Management Plan has also been proposed to remove the distinction between commercial and residential outdoor water uses, as well as a revised fine structure. A draft bylaw amendment has been prepared to include the restrictions associated with the water conservation stages and	175/17 No. 1 Bylaw 422 Review (Drought Management Plan) THAT the report titled Bylaw 422 Review (Drought Management Plan) be received; AND THAT Bylaw No. 422 Schedule "J" be amended to include the addition of "pressure washer" to Sections 1.1(e) and 2.1(e); AND THAT Bylaw No. 422 Schedule "J" be amended to include the addition of "at any time use water to fill a swimming pool, spa, garden pond, or decorative fountain" to Section 2.1(f); AND THAT the Drought Management Plan be updated to reflect the changes made to Bylaw 422. AND THAT amendments to the Municipal Ticket Information Bylaw No. 558 and Bylaw Notice Enforcement Bylaw 638 be prepared to reflect a fine structure based on the stage of water restriction as follows:

Date	Description	Board Resolution/Direction or Outcome Decision History
	to provide the SCRD General Manager Infrastructure Services / Regional Engineer with clear authority to enact those stages.	• Stage 1 - $100 • Stage 2 - $200 • Stage 3 - $300 • Stage 4 - $400 AND FURTHER THAT SCRD Water Rates and Regulations Amendment Bylaw No. 422.29 as amended be forwarded to the Board for readings and adoption.
June 14, 2017	Received Certificate of Approval for Bylaw No. 704 "Chapman Lake Water Supply Expansion Loan Authorization Bylaw No. 704, 2016"	
July 20, 2017	Well Protection Plan staff report to ISC with consultant report attached	242/17 No 1 Well Protection Plan THAT the report titled Well Protection Plan be received; AND THAT recommendations from the Well Protection Plan be brought forward to the 2018 Budget process.
July 21, 2017	Stage 2 water restrictions	
Sep 2, 2017	Stage 3 water restrictions	
Sep 26, 2017	UBCM meeting with Honourable George Heyman, Minister of Environment & Climate Change Strategy regarding Chapman Creek Water Supply Expansion Project	Briefing note as follows: The SCRD continues to address all requirements raised by BC Parks and FLNRO to assist with the adjudication of the permit and license applications, however, it is evident that the additional water is required now as the risk to community health and fish populations is already too high. The SCRD requests that the Provincial approval process be expedited in order to permit construction of the necessary infrastructure to meet summer 2018 environmental and community water needs.
Oct 3, 2017	Stage 4 water restrictions called Siphon Deployed	
Oct 19, 2017	Some rain has fallen in the Chapman Watershed – Stage 2 declared.	

Date	Description	Board Resolution/Direction or Outcome Decision History
Oct 19, 2017	Groundwater Investigation to Supplement Chapman Creek Water Supply report to ISC with presentation by Consultants, Waterline Resources Inc.	300/17 No. 1 THAT the report titled Groundwater Investigation to Supplement Chapman Creek Water Supply be received; AND THAT recommendations from the Groundwater Investigation to Supplement Chapman Creek Water Supply Report be brought forward to the 2018 Budget process; AND FURTHER THAT the SCRD consult with the Town of Gibsons, District of Sechelt, and Sechelt Indian Government District regarding proposed aquifer exploration identified in the report, prior to concluding the 2018 Budget process. 300/17 No. 2THAT terms of reference for a groundwater consultation process involving local government and stakeholders be prepared for Board review.
Oct 24, 2017	All water restrictions lifted.	
Nov 21, 2017	Water Information Session for Elected Officials	
Nov 22, 2017	District of Sechelt – Special Planning and Community Development Committee SCRD Comprehensive Regional Water Plan Update	
Nov 28, 2017	Letter from Jennie Aikman, Regional Director, MoE, to CAO re: Tetrahedron Park – SCRD Community Water Supply included in the Dec 21/17 ISC agenda package.	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Janette Loveys, Chief Administrative Officer

SUBJECT: **INFRASTRUCTURE PLANNING GRANT PROGRAM – JANUARY 2018 APPLICATIONS**

RECOMMENDATION(S)

THAT the report titled Infrastructure Planning Grant Program – January 2018 Applications be received;

AND THAT applications be submitted to the January 2018 Infrastructure Planning Grant Program for the Regional Water Storage Capacity Planning and Sunshine Coast Arena and Sports Fields Water Efficiency Study projects.

BACKGROUND

The Local Government Infrastructure Planning (IP) Grant Program is a provincially funded grant program that assists local governments in developing sustainable infrastructure that will support economic, social and environmental benefits to local communities.

The purpose of this report is to seek Board approval to submit grant applications for two (2) key water related planning projects that will be brought forward to 2018 budget discussions for consideration:

- [370] Regional Water Storage Capacity Planning
- [615] & [650] Sunshine Coast Arena and Sports Fields Water Efficiency Study

DISCUSSION

[370] Regional Water Storage Capacity Planning

In the 2013 Comprehensive Regional Water Plan (CRWP) it is recommended to construct an engineered storage lake adjacent to the Chapman Creek Water Treatment Plant. The concept consists of a lined constructed raw water storage reservoir with a new intake on Chapman Creek. The storage lake is identified as a long term project in the CRWP. Staff recommend moving the investigation of water storage forward which would include site identification, preliminary engineering and costing.

The establishment of the Water Sustainability Act by the Province of BC, requirements have changed from the 2013 concept related to licensing and land tenure.

This project aligns with the selection criteria requirements of the IP grant program including many of the following eligibility objectives:

- Reduced ecological footprint and enhanced environmental protection and enhancement
- Sustainable planning, design and management
- Efficient use of infrastructure and other resources

[615] & [650] Sunshine Coast Arena and Sports Fields Water Efficiency Study

The Sunshine Coast Arena uses a significant volume of potable water annually to operate the facility, including ice making, cooling the ice plant and drinking/sanitation. Investigating alternative water supply options for the arena (i.e. wells, reclaimed wastewater, etc.) as well as other water conservation options such as water reuse feasibility and/or efficient water fixtures could have many benefits. These alternatives could make a more efficient use of a community resource (i.e. potable water), reduce consumption of a renewable resource, and contribute to a more resilient recreation facility capable of operating in water-restricted conditions.

SCRD sports fields also consume considerable amounts of potable water for irrigation, waterparks and other purposes. Exploring the feasibility of utilizing alternative water supply options such as groundwater sources (i.e. wells, aquifers, etc.) as well as investigating improvements to irrigation scheduling technology, equipment efficiency, water capture and other conservation options would be included in the scope of work for this initiative.

This project aligns with the selection criteria requirements of the IP grant program including many of the following eligibility objectives:

- More efficient use of infrastructure and natural resources
- Conservation and demand-side management approaches
- Sustainable planning, design and management
- Innovation and new approaches

Financial Implications

Under the IP grant program, the province will provide a maximum grant amount of $10,000 for approved projects.

At the time of this report, the above two mentioned projects have the following recommended budget amounts that will be included and brought forward into R1 Budget discussions:

- [370] Regional Water Storage Capacity Plan - $200,000 (capital reserves)
- [615] & [650] Sunshine Coast Arena and Sports Fields Water Efficiency Study - $55,000 (taxation)

If the SCRD is successful in receiving funding towards one (or more) of these applications under the IP grant program then grant funding will be utilized to offset the budgeted sources of internal funding (i.e. reserves/taxation).

Timeline for next steps or estimated completion date

If resolved by the Board, staff will submit applications for funding under the Infrastructure Planning grant program's January 17, 2018 intake for the two projects identified above. The review period by the Ministry is typically 6-8 weeks with any approval announcements expected sometime in March or April 2018.

If applications are not successful they may be reconsidered for subsequent evaluation for the next round of approvals.

STRATEGIC PLAN AND RELATED POLICIES

These two projects support the SCRD Strategic Plan's Embed Environmental Stewardship and Ensure Fiscal Sustainability priorities.

CONCLUSION

The Local Government Infrastructure Planning Grant Program offers grants to support local government in projects related to assessing the technical, environmental and/or economic feasibility of municipal projects. The next application intake is January 17, 2018.

Staff recommend that the SCRD submit applications for two key water related projects under this program: *Regional Water Storage Capacity Planning* and *Sunshine Coast Arena and Sports Fields Water Efficiency Study*.

Both projects meet the eligibility requirements and selection criteria of the IP grant program and have outcomes that align with the program's overarching funding purpose.

Reviewed by:			
Manager	X – S. Walkey	Finance	
GM	X – I. Hall	Legislative	
CAO	X – J. Loveys	Other	X – B. Rebner

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **DRAFT REGIONAL ORGANICS DIVERSION STRATEGY – IMPLEMENTATION OPTIONS**

RECOMMENDATION(S)

THAT the report titled Draft Regional Organics Diversion Strategy – Implementation Options be received;

AND THAT the Draft Regional Organics Diversion Strategy be amended with Implementation Option 1;

AND FURTHER THAT recommendations from the Draft Regional Organics Diversion Strategy that require funding be brought forward to the Round 1 2018 budget.

BACKGROUND

Diversion of organics has been identified as a Board priority to extend the lifespan of the Sechelt Landfill and to meet the targets in the SCRD's Solid Waste Management Plan (SWMP).

In 2017 the SCRD developed a Draft Regional Organics Diversion Strategy (Draft Strategy).

The Draft Strategy's implementation plan includes a commercial food waste ban in 2018 and for 2019, to implement a food waste reduction campaign, an at-home compost coaching program, and to investigate a backyard composting subsidy program.

As well, the Draft Strategy recommends the SCRD implement a residential curbside food waste collection service for all SCRD residences that currently receive garbage collection (Electoral Areas B, D, E, F) and a drop-off for residents in Electoral Area A.

The Draft Strategy was presented at the July 20, 2017 Infrastructure Services Committee meeting.

Subsequently, a timeline for the Draft Strategy was presented at the September 21, 2017 Infrastructure Services Committee meeting.

An Elected Officials Solid Waste Workshop was held on October 24, 2017 and the summary and recommended direction was presented at the November 23, 2017 Corporate and Administrative Services Committee meeting.

The resulting recommendations were adopted:

July 27, 2017 Board Meeting

242/17 Recommendation No. 3

THAT staff report on a possible landfill ban on residential organics in 2020 and beyond.

242/17 Recommendation No. 4

THAT staff report on an Organics Strategy Implementation Plan in Q4 2017;

AND THAT Compost Coaching and Food Waste Reduction Programs be considered for inclusion in 2018 Budget deliberations;

AND FURTHER THAT consideration be given to partnerships with stakeholders for the implementation of on-site Compost Coaching.

242/17 Recommendation No. 5

THAT forthcoming staff reports and communication plans identify rural best practices with regards to wild animal welfare for both backyard composting and curbside pickup.

242/17 *Recommendation No. 7*

AND THAT the Draft Regional Organics Diversion Strategy be adopted;

AND THAT the strategy be maintained in draft form until an implementation plan is developed and approved;

AND FURTHER THAT recommendations from the Draft Regional Organics Diversion Strategy that require funding be brought forward to the 2018 and 2019 budgets.

October 12, 2017 Board Meeting

272/17 *Recommendation No. 4*

AND THAT consideration of the adoption of the Timeline for the Regional Organics Diversion Strategy be deferred until following the October 24th Solid Waste Intergovernmental Workshop, but prior to 2018 Budget deliberations.

The purpose of this report is to present implementation options for the Draft Strategy and seek adoption by the Board.

DISCUSSION

After consideration of the Board Recommendations from the Draft Strategy, and the Elected Officials Solid Waste Workshop, staff prepared four Implementation Options for the Regional Organics Diversion Strategy.

A summary of the four options are included in Table 1. The summary table incorporated financial implications, if possible, as identified in the Draft Strategy and required resources. Procurement will be required to determine costs for drop-off services and residential curbside collection.

Option 1

Option 1 includes the full set of recommended initiatives from the Draft Strategy and is based on best practices and quantified diversion results from programs in other regional districts.

Option 1 includes:

2018

- Commercial food waste ban
- Depot drop-off service for Area A

2019

- Residential curbside food waste collection for Electoral Areas B, D, E and F
- Food waste reduction campaign
- At-home compost coaching program
- Investigation of a composter subsidy program

2020

- Investigate a residential food waste ban

In addition to a depot drop-off service for Area A, staff propose in 2018 to add depot drop-off for the south coast (Gibsons area) and mid-coast (Sechelt area) to enable residents not serviced by curbside collection such as tourists, island residents or secondary residents to divert food scraps.

A residential food waste ban is only recommended with the implementation of curbside collection.

Option 1 is projected to divert an estimated at 2,301 tonnes per year (1,401[1] tonnes from residents and 899 tonnes from the Institutional, Commercial and Industrial (ICI) sector). Option 1 results in approximately fifteen months of additional site life at the Sechelt Landfill.

Staff recommend Option 1 as it has the highest diversion potential and longest Sechelt Landfill site life extension.

Option 2

Option 2 has primarily the same components as Option 1, with the exception of a curbside food waste collection service for Electoral Areas B & D only and with no residential food waste ban. Depot drop-off service is still recommended to be provided in three areas on the coast.

Based on estimates in the Draft Strategy, Option 2 is anticipated to divert approximately 2,051 tonnes per year (1,152[2] tonnes from residents and 899 tonnes from ICI sector). Option 2 results in approximately 13 months of additional site life at the Sechelt Landfill.

Option 3

The primary difference with Option 3 is that this option provides depot drop-off services only. There would be no curbside collection of food waste in any electoral area and as such, no residential food waste ban proposed. This option maintains the commercial food waste ban in 2018 and implementation of a food waste reduction campaign, at-home compost coaching program and investigation of a composter subsidy program.

Based on estimates in the Draft Strategy, Option 3 is projected to divert the least amount of organic waste from the landfill at a total of 1,776 tonnes per year (877[3] tonnes from residents and 899 tonnes from ICI). Option 3 results in approximately 11 months of additional site life at the Sechelt Landfill.

Option 4

Option 4 is to maintain status quo and deliver no new services or programs to divert organic waste from the landfill. Staff do not recommend this option.

[1] Based on implementation of curbside collection programs: 674 tonnes per year from EA's B, D, E, F and 727 tonnes per year from Member Municipalities combined.
[2] Based on implementation of curbside collection programs: 425 tonnes per year from EA's B & D and 727 tonnes per year from Member Municipalities combined.
[3] This estimate is based on 10kg/pp/yr food waste recovery rate from PRRD residential depot drop-off pilot.

Table 1 – Summary of Implementation Options for the Regional Organics Diversion Strategy

Implementation Options for the Regional Organics Diversion Strategy				
Actions from Draft Strategy & Timeline	**Option 1**	**Option 2**	**Option 3**	**Option 4**
Commercial Food Waste Ban	2018 Ban	2018 Ban	2018 Ban	Status Quo no ban
Residential Food Waste	2018 Drop-off, 3 locations, regional service, funded from taxation 2019 Residential Collection for EA's B, D, E, F; funded from user fees	2018 Drop-off, 3 locations, regional service, funded from taxation 2019 Residential Collection for EA's B, D; funded from user fees	2018 Drop-off only; 3 locations, regional service, funded from taxation	Status Quo no food waste diversion option
Diversion potential	2,301 t/year	2,051t/year	1,776 t/year	0
Additional Site Life at the Sechelt Landfill	15 months	13 months	11 months	0
Food Waste Reduction Campaign & At-home Compost Coaching Program	2018 0.5 FTE; funded from taxation 2019 estimated annual operating budget of $20,000; funded from taxation	2018 0.5 FTE; funded from taxation 2019 estimated annual operating budget of $20,000; funded from taxation	2018 0.5 FTE; funded from taxation 2019 estimated annual operating budget of $20,000; funded from taxation	Status Quo no food waste reduction campaign or at-home compost coaching program
Investigate a Backyard Composter Subsidy Program	2019 budget TBD; funded from taxation	2019 budget TBD; funded from taxation	2019 budget TBD; funded from taxation	Status Quo no backyard composter subsidy program
Residential Food Waste Ban	2020 Investigation	Status Quo no ban	Status Quo no ban	Status Quo no ban

Timeline for next steps

The timeline that was presented on September 21, 2017 is included as Attachment B. The timeline will need to be updated based on which implementation option the Board selects.

An updated Strategy and timeline will be brought forward to the January 18, 2018 Infrastructure Services Committee and the subsequent Board meeting on January 25, 2018 for adoption as Final.

Additionally, the implementation option selected will be incorporated into a Q1 2018 report regarding curbside collection services and the upcoming Request for Proposal (RFP).

Communications Strategy

A communication plan will be developed for each component of the Strategy and will be incorporated into the implementation plan.

STRATEGIC PLAN AND RELATED POLICIES

A Regional Organics Diversion Strategy supports the Strategic Priority of Embed Environmental Leadership.

The Strategy is in support of the SCRD's Solid Waste Management Plan's target of 65%-69% diversion and organics diversion is one of the SWMP's reduction initiatives.

CONCLUSION

The Draft Regional Organics Diversion Strategy was developed in response to a need to extend the lifespan of the Sechelt Landfill and help meet the targets in the SCRD's Solid Waste Management Plan.

Out of all the proposed options, Option 1 has the greatest potential to divert food scraps from the landfill. Staff recommend Option 1.

An updated Strategy and timeline will be presented at the January 18, 2017 Infrastructure Services Committee and the subsequent Board meeting on January 25, 2018 for adoption as Final.

ATTACHMENTS

Attachment A: Draft Regional Organics Diversion Strategy

Attachment B: Timeline

Reviewed by:			
Manager		Finance	
GM		Legislative	
CAO	X-J.Loveys	Other	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – September 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **TIMELINE FOR THE DRAFT REGIONAL ORGANICS DIVERSION STRATEGY**

RECOMMENDATION(S)

THAT the report titled Timeline for the Draft Regional Organics Diversion Strategy be received;

AND THAT the Timeline for the Regional Organics Diversion Strategy be adopted.

BACKGROUND

Diversion of organics has been identified as a priority to extend the lifespan of the Sechelt Landfill and to meet the targets set out in the SCRD's 2011 Solid Waste Management Plan (SWMP).

A Draft Regional Organics Diversion Strategy was developed by Carey McIver and Associates Ltd. and presented at the July 20, 2017 Infrastructure Services Committee Meeting. The resulting recommendations were subsequently adopted at the July 27, 2017 Board Meeting as follows:

242/17 Recommendation No. 3

THAT staff report on a possible landfill ban on residential organics in 2020 and beyond.

242/17 Recommendation No. 4

THAT staff report on an Organics Strategy Implementation Plan in Q4 2017;

AND THAT Compost Coaching and Food Waste Reduction Programs be considered for inclusion in 2018 Budget deliberations;

AND FURTHER THAT consideration be given to partnerships with stakeholders for the implementation of on-site Compost Coaching.

242/17 Recommendation No. 5

THAT forthcoming staff reports and communication plans identify rural best practices with regards to wild animal welfare for both backyard composting and curbside pickup.

242/17 Recommendation No. 7

AND THAT the Draft Regional Organics Diversion Strategy be adopted;

AND THAT the strategy be maintained in draft form until an implementation plan is developed and approved;

AND FURTHER THAT recommendations from the Draft Regional Organics Diversion Strategy that require funding be brought forward to the 2018 and 2019 budgets.

The purpose of this report is to provide a Timeline for the Draft Regional Organics Diversion Strategy.

DISCUSSION

The timeline considers both the priorities identified in the Strategy and the 242/17 Board recommendations. It is intended to be a high-level guiding document that lists the main tasks required to fulfill each priority, with their associated timing and phases.

The timeline specifically addresses the Board recommendations regarding compost coaching, food waste reduction programs and a possible landfill ban on residential organics. After much consideration when reviewing the priority items of the Strategy and associated timelines, compost coaching and food waste reduction programs were placed in 2019 and a possible landfill ban on residential organics in 2020.

Although the Strategy recommends residential curbside collection for residences in Areas currently receiving curbside garbage collection, the timeline provides for interim drop-off at two locations while the planning process is underway for a potential 2019 curbside program. This also ensures equitable service for all residents as the recommended approach for organics diversion for Electoral Area A (Pender Harbour/Egmont) is drop-off.

The timeline is intended to be a living document and will be updated as required.

The timeline begins in Q4 2017. However, the timeline is reliant upon several process steps first being completed, and any delays in these initial steps will result in a corresponding delay in starting the Plan. The initial process is summarized in Table 1.

Table 1 – Process Required for Strategy Implementation

Process Required Prior for Strategy Implementation	Status	Date
Develop Regional Organics Diversion Strategy	Completed	Jul 2017
Board Adoption of Strategy	Adopted as Draft	Jul 27, 2017
Board direction to develop Timeline	Completed	Sep 2017
Board Adoption of Timeline	In Progress	Sep 21, 2017 ISC Oct 12, 2017 Board
Workshop with member municipal Councils and SCRD Board	Started	Oct 24, 2017
Board Adoption of Strategy	Not Started	Nov 16, 2017 ISC Nov 23, 2017 Board
Begin Implementation of Strategy	Not Started	Dec 2017

Financial Implications

Each component of the Draft Regional Organics Diversion Strategy will require a separate budget to be developed. Actual budgets are dependent on options and approaches selected and level of participation by Electoral Areas and member municipalities. Capital and operational budgets will be refined and finalized as the implementation plan proceeds and brought forward to the 2018 and 2019 Budgets as required.

Timeline for next steps

The next step after Board adoption of the timeline, and subsequently the Strategy, is to secure long-term legal contracts with a processor and a hauler. Any delay in securing contracts will shift the timeline as it the driver for most of the remaining actions of the Strategy.

Communications Strategy

A communication plan will be developed for each component of the Strategy and is identified in the Timeline.

STRATEGIC PLAN AND RELATED POLICIES

A Regional Organics Diversion Strategy supports the Strategic Priority of Embed Environmental Leadership.

The Strategy is in support of the SCRD's Solid Waste Management Plan's target of 65%-69% diversion and organics diversion is one of the SWMP's reduction initiatives.

CONCLUSION

The Draft Regional Organics Diversion Strategy was developed in response to a need to extend the lifespan of the Sechelt Landfill and help meet the targets in the SCRD's Solid Waste Management Plan.

The first step after Board adoption of the Draft Strategy was to develop a timeline. As such, a comprehensive timeline of high level tasks required to launch each priority of the Draft Strategy has been completed.

After Board adoption of the timeline, and subsequently the Strategy, the work will begin as identified in the Timeline.

ATTACHMENT – Timeline for the Draft Regional Organics Diversion Strategy

Reviewed by:			
Manager	X-R.Cooper	Finance	
GM	X-M. Day	Legislative	
CAO	X-J.Loveys	Other	

Carey McIver & Associates Ltd.

ENVIRONMENTAL CONSULTANTS

Sunshine Coast Regional District

Regional Organics Diversion Strategy

Draft for Discussion

Prepared by:

Carey McIver & Associates Ltd.

In Collaboration with:

Maura Walker & Associates

Date: July 12, 2017

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Appendices

1 Introduction

Diverting organic waste from landfill disposal is a significant solid waste management issue in BC. This is because organic waste, comprised primarily of yard and garden waste (green waste), food waste and food-soiled paper from businesses and households, not only represents the largest component of landfilled waste (35%-40%), but also generates methane, a potent greenhouse gas, during decomposition in a landfill.

Accordingly, the BC Ministry of Environment (MOE) has established new solid waste management goals as part of its Service Plan: to lower the provincial municipal solid waste (MSW) disposal rate to 350 kilograms per person annually and to have 75% of BC's population covered by organic waste disposal bans by 2020. To meet these goals the MOE is proposing that regional districts, as part of their solid waste management planning process, adopt as a guiding principle, "preventing organic waste including food waste from going into the garbage wherever practical."

The Sunshine Coast Regional District (SCRD) recognized this principle in 2011, when the Board approved and adopted the current Solid Waste Management Plan (SWMP). This plan includes a series of initiatives related to diverting yard and food wastes from disposal that, if implemented, would contribute to meeting the plan's target diversion rate of 65%-69% (315 to 279 kilograms per person) within five years.

Although there has been substantial diversion of green waste from landfill disposal, there has been limited progress with respect to the diversion of food waste (kitchen waste, food scraps and food-soiled paper). This was confirmed in the 2014 SCRD Waste Composition Study which identified food waste as representing 45% of the residential waste stream with green waste at only 2%. Accordingly, the current regional diversion rate sits at 56%, with a corresponding disposal rate of 434 kilograms per person in 2016.

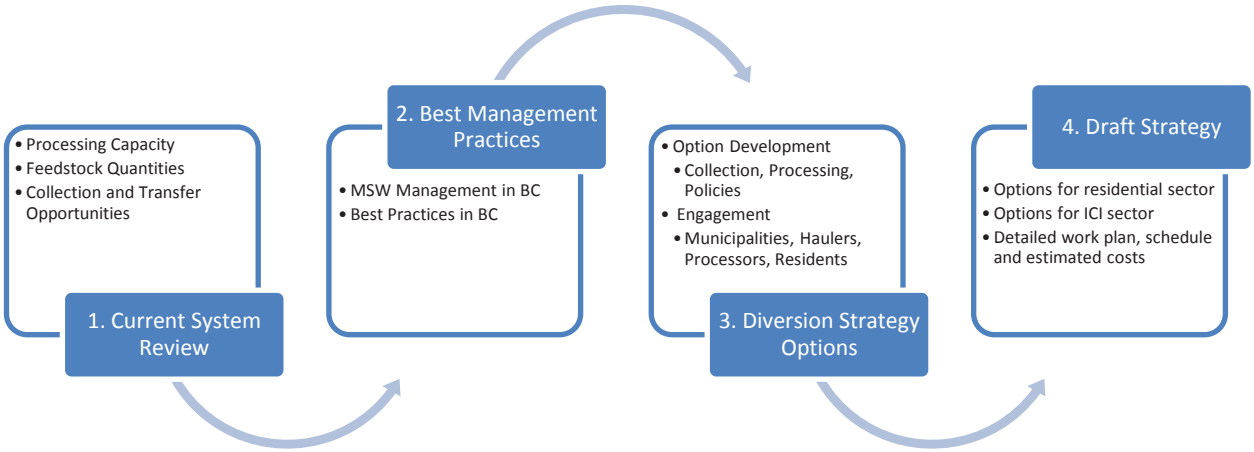
In recognition of the need to increase the diversion of food wastes, the SCRD engaged Carey McIver & Associates Ltd., in collaboration with Maura Walker & Associates (the Project Team), to develop a Regional Organics Diversion Strategy. Building on the initiatives identified in the 2011 SWMP, the objective of this strategy is to provide a financially sustainable road map that will lead to a robust, Sunshine Coast-wide full organics diversion program.

1.1 Objectives and Methodology

To develop a strategy that details the "who, what, where and when" for organics diversion in the SCRD the Project Team undertook two concurrent and intertwined processes: the technical process and the community engagement process.

As indicated in Figure 1-1, the technical process was organized into four key stages: a review of the current system for managing organic wastes in the SCRD; a scan of best practices and innovations in other BC jurisdictions; the development of realistic and practical diversion options for the SCRD and the development of a draft regional organics diversion strategy.

Figure 1-1: Project Methodology



The community engagement process was interwoven throughout the technical process, beginning with individual contacts with key stakeholders during the current system review, an SCRD coordinated meeting with municipal partners to provide a high-level overview of the strategy development and timelines as well as telephone interviews with hauling companies providing collection services throughout the region.

With respect to engagement with residents, the SCRD included a questionnaire on organics management as part of their series of Community Dialogues held in May 2017 and was made available online from May 8 to June 2, 2017. The feedback from this process has provided valuable insights into the development of the draft strategy contained in this report.

1.2 Overview and Structure of the Report

The report is structured as follows:

Section 2 outlines the organics diversion initiatives outlined in the 2011 SWMP as well as a description of the current organics management system including existing reduction and collection programs as well as drop-off, processing and disposal facilities.

Section 3 provides examples of best practices in organics management in BC which have informed the new Ministry of Environment (MOE) Service Plan targets for organic waste management. This section also updates the feedstock estimate provided in the 2011 SWMP based on actual data.

Section 4 describes the results of the community and stakeholder engagement process designed to inform the development of organic management options.

Section 5 outlines practical and realistic scenarios to increase organic waste diversion in the SCRD informed by best practices as well as the results of community and stakeholder engagement.

Section 6 outlines the draft regional organics diversion strategy including a workplan, schedule and estimated cost implications.

2 Current System Review - Organic Waste Management in the SCRD

This section summarizes the current system for managing organic wastes in the SCRD including the status of organics diversion initiatives included in the 2011 SWMP.

2.1 Organic Diversion Initiatives in the 2011 SWMP

In British Columbia, regional districts develop solid waste management plans (SWMP) as required under the provincial Environmental Management Act. These plans are long term visions of how each regional district would like to manage its solid wastes and are updated on a regular basis so that they reflect current needs, local priorities, market conditions, technologies and regulations.

The SCRD's current SWMP was approved and adopted in 2011. The objective of the 2011 SWMP was to adopt zero waste as a guiding principle, to outline a roadmap of practical measures toward the goal, and to achieve the highest level of environmental and human health protection. The plan contains major reduction, reuse, recycle and diversion initiatives that, if fully implemented, would increase diversion from 50% in 2011 to between 65% and 69% in 2016.

Table 2-1 outlines the organic diversion initiatives for yard and food wastes that are included in the 2011 SWMP.

Table 2-1: 2011 SWMP Organics Diversion Initiatives

Initiatives
Reduction
➢ Incentive Based Tipping Fees
➢ Grass-Cycling and Backyard Composting Education
Recycling and Diversion
➢ Curbside Collection of Food Scraps
➢ Yard Waste Composting
➢ Processing Capacity for Food Scraps and Yard Waste

The following sections summarizes the implementation status of these initiatives.

2.2 Current Reduction Programs

Incentive Based Tipping Fees

Tipping fees are the charges that are applied to discarded materials deposited in landfills. The 2011 SWMP outlined how incentive based tipping fees are structured to provide financial incentives that discourage discarding waste into landfills, provided that there are more economical options to divert that material. As indicated in Table 2-2, the current tipping fee structure in the SCRD provides a significant financial incentive to divert yard and garden waste from landfill. The quantities of yard and garden green waste delivered by residents and business to SCRD drop off locations is discussed in Section 2.4.

Table 2-2: Current SCRD Incentive Based Tipping Fee Structure for Organics

Material for Disposal	Tipping Fee
Municipal Solid Waste	$150 per tonne
Yard and Garden Green Waste	
-Residential self-haul loads less than 5 tonnes	NO CHARGE
-Residential self-haul loads more than 5 tonnes	$45 per tonne
-Commercial loads	$45 per tonne

Grass-Cycling and Backyard Composting

Grass-cycling and backyard composting are options that reduce the generation of organic waste. Grass-cycling and backyard composting are considered one of the most sustainable methods for managing organic waste. The 2011 SWMP proposes that the SCRD will promote backyard composting, offer compost training courses, operate a compost demonstration garden and encourage grass-cycling. The SCRD currently promotes its Guide to Backyard Composting and grass-cycling online and at community outreach events and has hosted a limited number of compost training courses. A compost demonstration garden and regular compost training sessions have yet to be implemented

2.3 Current Collection Programs

Although the 2011 SWMP recommended that municipal and SCRD operated curbside collection services be expanded to include food waste within five years, there has been limited progress to date. As indicated in Table 2-3, except for the pilot project in the Davis Bay community of Sechelt, there are currently no permanent curbside collection services in place for organics, either food waste or green waste on the Sunshine Coast.

Table 2-3: Curbside Collection Services in the Sunshine Coast

Area	2016 Census		Curbside Collection Services			
	Population	Households	Households	Garbage	Recycling	Organics
Municipal						
Sechelt District Municipality	10,216	4,855	4,305	Yes	Yes	No
Town of Gibsons	4,605	2,220	2,056	Yes	No	No
Sechelt Indian Government District	671	290	273	Yes	Yes	No
Municipal Sub-Total	*15,492*	*7,365*	*6,634*			
Electoral Areas						
SCRD Collection Service						
EA B - Halfmoon Bay	2,726	1,250		Yes	No	No
EA D - Roberts Creek	3,421	1,505		Yes	No	No
EA E - Elphinstone	3,664	1,550		Yes	No	No
EA F - West Howe Sound	2,043	945		Yes	No	No
SCRD Service Sub-Total	*11,854*	*5,250*	*5,675*			
EA A - Pender Harbour/Egmont	2,624	1,385	-	No	No	No
Electoral Area Sub-Total	14,478	6,635				
Regional Total	**29,970**	**14,000**	**12,309**			

Table 2-3 provides the population and household count according to the 2016 Census. The household count for curbside collection was provided by each individual service provider. Although the Census household count is not consistent with the service household count, overall the numbers indicate that the majority of households on the Sunshine Coast (roughly 90%) are currently receiving curbside garbage collection services.

While curbside collection programs on the Sunshine Coast are operated by local governments, collection service is provided by private sector contractors, except for the Sechelt Indian Government District. Table 2-4 outlines the contractors and expiry dates for current contracts within the Sunshine Coast.

Table 2-4: Curbside Collection Service Providers 2016

Service Provider	Households 2016	Contractors		
		Garbage	Recycling	Expiry Date
Sechelt	4,305	Direct Disposal	Direct Disposal	February 28, 2019
Gibsons	2,056	Grayco Ventures	NA	February 28, 2019
SIGD	273	In-House	In-House	
SCRD	5,675	Direct Disposal	NA	February 28, 2019

District of Sechelt Organics Collection Pilot Project

The District of Sechelt (DOS) has been operating a small food and green waste collection pilot project to around 500 single family homes in Davis Bay since May 23, 2014. According to the DOS web site, DOS staff will be developing a proposal for Council consideration on District-wide curbside organics collection based upon an analysis of the multi-year project. Under contract to DOS, Grayco Disposal collects the food waste and green waste from Davis Bay and delivers the material to the Salish Soils composting facility at a processing cost of $80 per tonne.

2.4 Current Drop-Off Facilities

As discussed in Section 2.2, the SCRD provides three locations for residents to drop-off green waste and two locations for businesses to drop-off their green waste.

Residents can drop-off their green waste at the Pender Harbour Transfer Station, Salish Soils in Sechelt or on the South Coast at the drop-off located on the site of the Town of Gibsons Public Works Yard. The residential program is funded from taxation, so the residents are not charged at the time of drop-off. Commercial green waste can be dropped off at the Pender Harbour Transfer Station or the Sechelt Landfill at the current rate of $45 per tonne. Alternatively, commercial green waste can be delivered to Salish Soils or other private facilities.

Salish Soils also accepts residential and commercial food waste at a cost of $80 per tonne for larger quantities delivered by commercial hauling companies and $85 per tonne for self-haul customers. However, clean food waste in 5 gallon buckets and under is free of charge to residential customers.

Figure 2-1 indicates the tonnes of green waste that has been accepted to these facilities over the last five years. In 2016, 4,343 tonnes of green waste was delivered these facilities.

Figure 2-1: Total Green Waste Diverted at SCRD Sites/Services 2012-2016

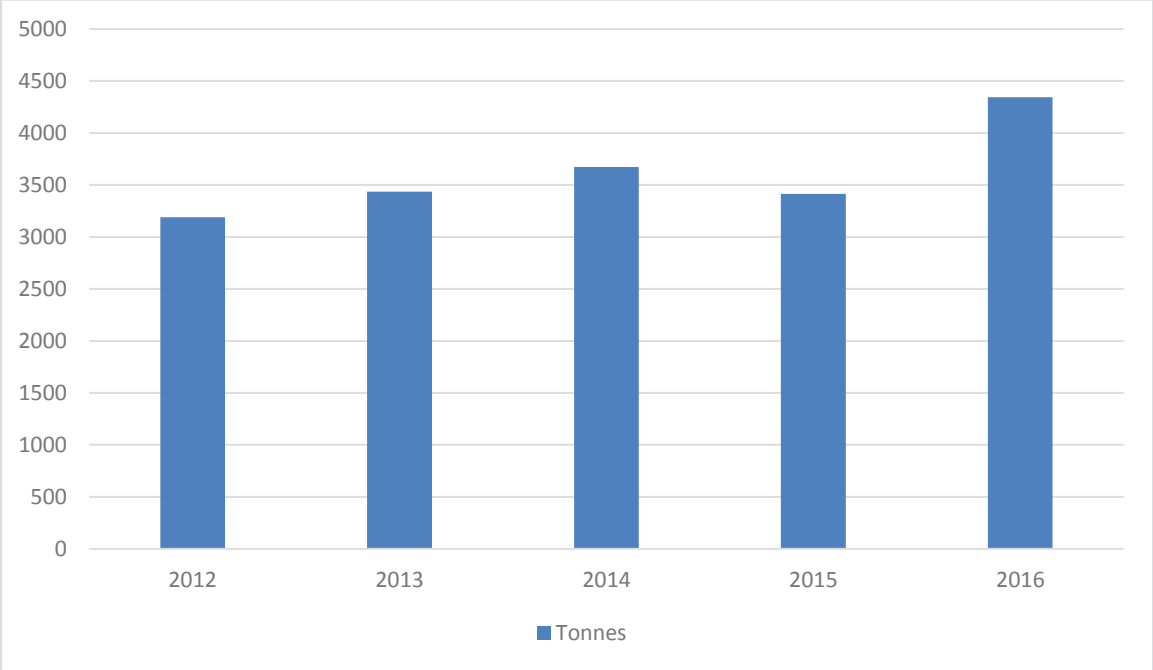
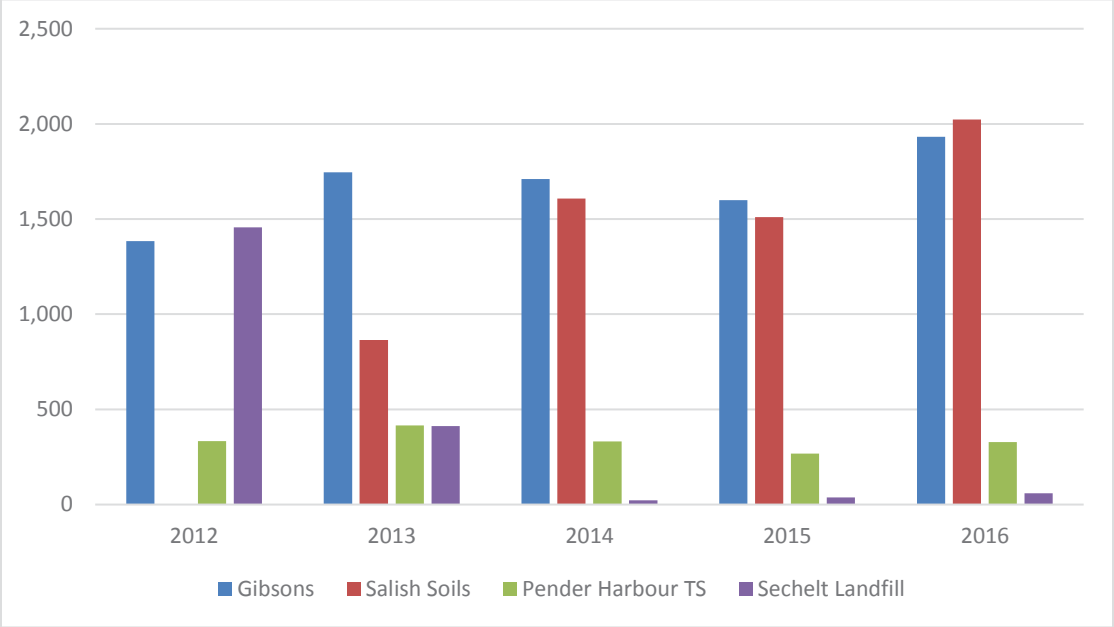


Figure 2-2 indicates the quantity accepted by individual facility. As illustrated in Figure 2-2, Salish Soils began accepting residential and commercial yard waste in 2012 and has since replaced the Sechelt Landfill as the main drop-off facility in the Sechelt area.

Figure 2-2: Total Green Waste Diverted by SCRD Drop-Off Facility – 2012-2016



Note: Does not include commercial green waste delivered to Salish Soils. Pender Harbour Transfer Station is a combination of residential and commercial green waste.

2.5 Current Processing Capacity

Prior to 2012, the SCRD chipped and hauled green waste to Howe Sound Pulp and Paper in Port Mellon, to be used as fuel. However, the 2011 SWMP recognized that establishing local processing capacity for composting green waste would provide the SCRD with the opportunity to also compost food scraps and soiled paper in the future. Consequently the 2011 SWMP recommended that the SCRD continue to support and enhance local composting operations through green waste collection and contracts with private sector operators.

In January 2011, Salish Soils Inc. submitted a notification under the provincial Organic Matter Recycling Regulation (OMRR) that they planned to construct and operate a composting facility on property owned by the Sechelt Indian Band at 5800 Black Bear Road in Sechelt. The OMMR governs the production, quality and land application of certain types of organic matter. Although the Salish Soils facility is not subject to OMRR, the company has met all the requirements of the regulation for a facility of its size.

Salish Soils operates a covered aerated static pile compost facility using the Gore Cover System to produce a Class A compost under the OMRR. The production design capacity of the Salish Soils composting facility is 12,000 tonnes per year of compost made from organic materials including fish waste and green waste. However, the facility is currently processing roughly 6,500 tonnes of compost made from green waste and fish waste, with limited quantities of food waste from the Davis Bay pilot, from residential food waste drop-off as well as from a pilot program in the Powell River Regional District.

2.6 Sechelt Landfill Capacity

The Sechelt Landfill is located approximately 6.5 kilometres northeast of the District of Sechelt, at 4904 Dusty Road. The site is located on Crown Land under a License of Occupation. According to the Notes to the Financial Statements attached to the SCRD's 2016 Financial Audit Report (Appendix 1), the Sechelt Landfill is expected to reach its capacity in 2027. Given the difficulties and costs associated with siting and constructing a new landfill, conserving the capacity of this existing facility is imperative.

3 Best Practices Review

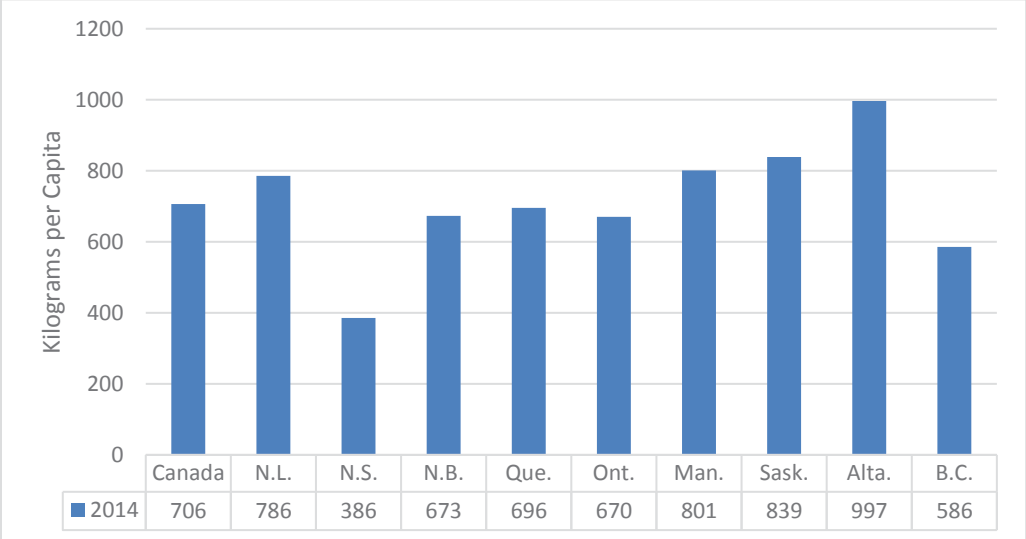
The SCRD does not need to look beyond BC to find examples of best practices in organic waste management. Municipal solid waste management (MSW) is an important environmental issue in BC. Over the last twenty-five years a dynamic system has evolved that provides efficient and effective MSW management services in the province. The following sections provide data on how the MSW management system in BC outperforms systems in similar jurisdictions as well as examples of best practices implemented by local governments in BC that could be applicable to the SCRD.

3.1 MSW Management System Performance in BC

This MSW management system in BC is guided by goals established by the Ministry of Environment (MOE) that aim to maximize waste reduction and diversion in the province. These ambitious goals, initially to reduce MSW disposal by 50% by the year 2000, and currently to reduce the provincial disposal rate to 350 kilograms per capita by 2020, have resulted in a MSW disposal rate that is significantly lower than systems in other provinces.

According to the Statistics Canada Waste Management Industry Survey for 2014, BC has the second lowest per capita MSW disposal rate in Canada. As indicated in Figure 3-1, the only province with a lower disposal rate was Nova Scotia, where organics have been banned from landfill disposal for the last decade.

Figure 3-1: Per Capita Disposal Rates for Canada and Selected Provinces 2014

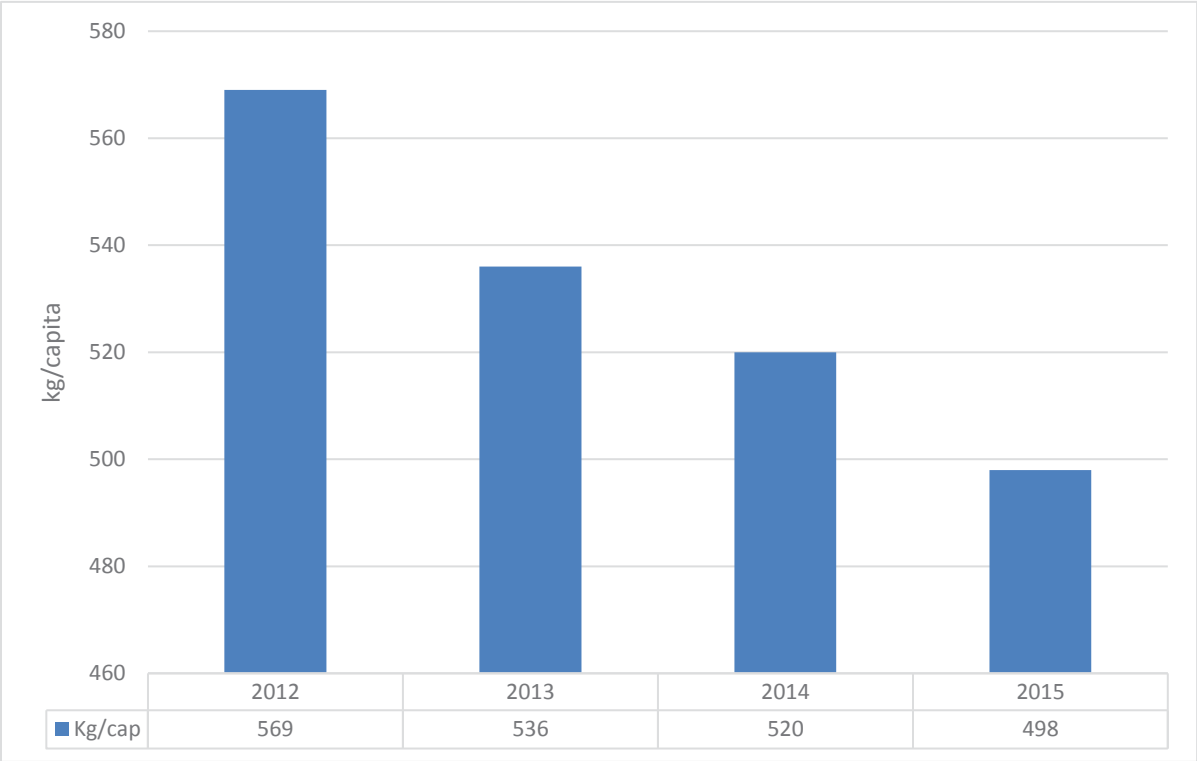


Source(s): Statistics Canada Disposal and Diversion of waste, by province and territory (Waste Disposal Per Capita) CANSIM tables 051-0001 and 153-0041(accessed May 2017)

Statistics Canada collects the BC disposal data from regional districts every two years and aggregates the results to the provincial level. Individual regional district data is not provided in the bi-annual reports. To provide more reliable and consistent annual data on MSW disposal by regional district, the MOE developed the BC Waste Disposal Calculator. The reporting methodology in the BC Calculator is identical to that used by Statistics Canada to ensure comparability between systems.

The BC Waste Disposal Calculator is an on-line reporting tool that has so far collected MSW disposal data for 2012, 2013, 2014 and 2015. The results of each year's data call are posted on Environmental Reporting BC. Figure 3-2 illustrates the results reported to date.

Figure 3-2: Per Capita Disposal Rate for BC 2012-2015



Although there is little variation between the Statistics Canada and BC MOE disposal rates for 2012 (573 and 569 kilograms per capita respectively), there is significant variation between Statistics Canada and BC MOE disposal rates for 2014 (586 and 520 kilograms respectively). This is likely due to the quality control exercised by the BC MOE with respect to ensuring that regional districts are meeting the reporting requirements correctly and consistently.

Individual regional district data for 2015 is presented in Figure 3-3 and indicates that at a reported 421 kilograms per capita, the 2015 disposal rate in the SCRD was less than the provincial average of 498.

Figure 3-3: Regional District Disposal Rates for BC 2015

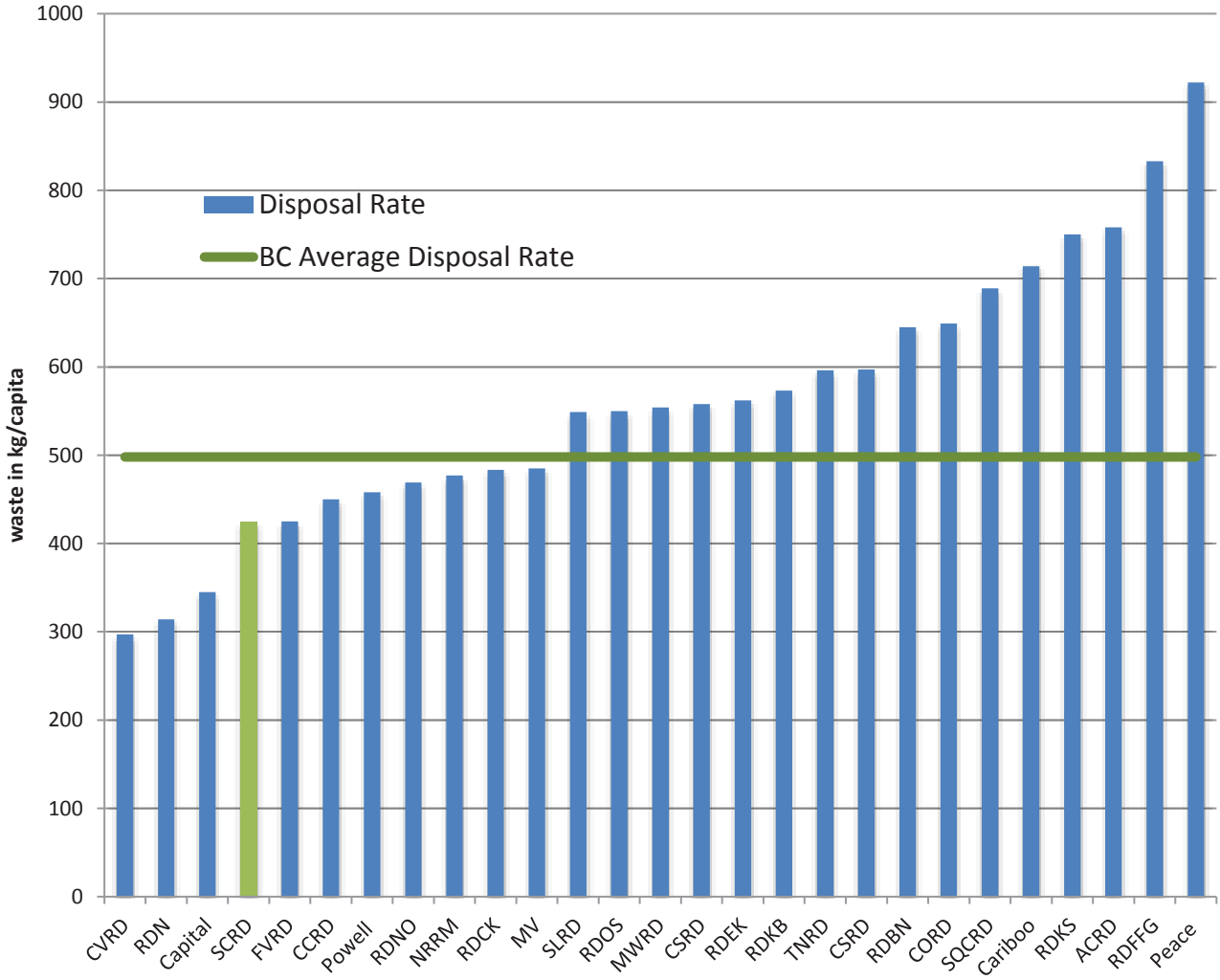
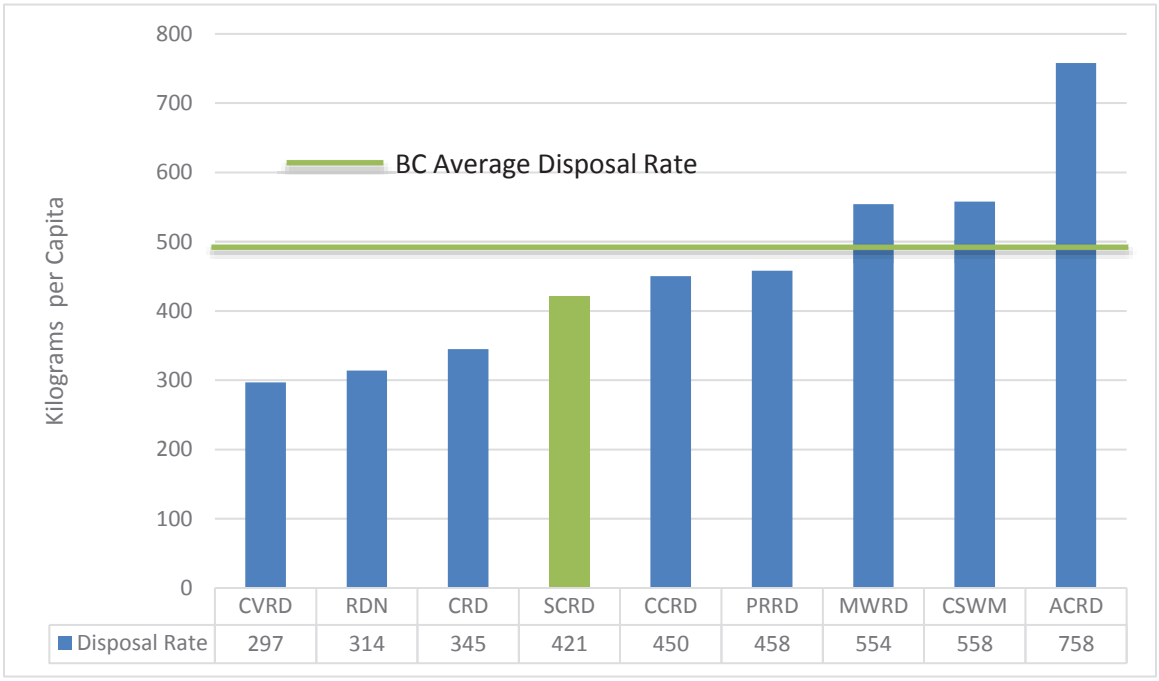


Figure 3-4 presents disposal rates for regional districts belonging to the Association of Vancouver Island Coastal Communities (AVICC) from lowest to highest. As indicated in Figure 3-4, the Cowichan Valley Regional District (CVRD), the Regional District of Nanaimo (RDN), and the Capital Regional District (CRD), all have significantly lower per capita disposal rates than the SCRD. The Central Coast Regional District (CCRD) and the Powell River Regional District (PRRD) have comparable rates while the Regional District of Mount Waddington (RDMW), the Comox Strathcona Waste Management (CSWM) service and the Alberni-Clayoquot Regional District (ACRD) all have disposal rates above the provincial average of 498 kilograms per capita.

Figure 3-4: Disposal Rates for AVICC Regional Districts 2015



	CVRD	RDN	CRD	SCRD	CCRD	PRRD	MWRD	CSWM	ACRD
Disposal Rate	297	314	345	421	450	458	554	558	758

The lower disposal rates in the CVRD, RDN and CRD can be attributed, in large part, to the implementation of organics diversion strategies in these three Vancouver Island regional districts. In 2006, both the CVRD and RDN introduced bans on the disposal of commercial organic wastes to reduce GHG emissions, preserve landfill capacity and reduce waste export disposal costs. Residential collection programs followed roughly 5-7 years later in both those regional districts. In 2015, the CRD introduced a ban on the disposal of both residential and commercial organics. More detailed information on programs and policies in comparable AVICC regional districts is provided in Appendix 2.

In 2015, Metro Vancouver also implemented a ban on the disposal of organics from both the commercial and residential sector. As a result, in 2015 roughly 66% of the population of BC was covered by an organic waste disposal ban. There are also numerous municipal curbside food waste collection programs in regional districts that have not implemented disposal bans (e.g. Grand Forks, Abbotsford, and Comox). Consequently, with respect to best practices in organic waste management, these BC local governments can provide practical and effective examples to other regional districts.

3.2 Best Management Practices and Innovations in BC

In 2014, on behalf of the MOE, Maura Walker & Associates (MWA), developed a set of case studies on innovative and effective best management practices by local governments in BC to reduce and recycle organic wastes. Applicable best practices with respect to reduction programs, disposal policies and collection programs are summarized below to provide input to the development of organic waste management options in the SCRD. Best management practices that have been introduced since the development of the MOE case studies are also included. More detailed information on each of the selected case studies is posted on the MOE website (http://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/organics/organics-case-studies)

3.2.1 Reduction Programs

Metro Vancouver Love Food Hate Waste

Based on research in Europe and North America, Canadians may be wasting approximately 25 percent of all the food and drinks that they purchase. Metro Vancouver's Love Food Hate Waste Program aims to change this behaviour by educating consumers about meal planning, and careful cooking and storage. This program is modelled on WRAP United Kingdom's initiatives of the same name, which has seen a 21% reduction in avoidable food waste since its launch in 2007. Metro Vancouver has stated publicly that they are willing to share this program with other regional districts. The BC Ministry of Environment will also provide the US EPA's "Food Too Good to Waste" toolkit to regional districts at no charge. The SCRD could implement either one of these programs at a relatively low cost.

North Shore Recycling Program Compost Coaching

The former North Shore Recycling Program (NSRP) focused on waste reduction, recycling and composting under contract for the three municipalities along the North Shore in Vancouver.

The Compost Coaching program was started in 2007 to reduce organics in the waste stream. A pilot program was conducted in 2008–2009 with full implementation in 2011–2013. The program was developed to address the Metro Vancouver goal of 70% diversion by 2015.

Compost Coaching is an outreach program that focuses on helping residents compost in their own backyards through at-home training which is a Community-Based Social Marketing (CBSM) approach. The program looked at how much material was composted before and after the training, as well as how much waste was produced per household. In the first year, 156 residents received at-home coaching. This coaching resulted in an additional 36 kg/capita/year of organic material composted on site for households that were already composting and 190 kg/capita/year for households that had not composted before. Households that participated in the program improved their composting skills, produced higher quality compost in a shorter time and reduced hazards from bears and pests. This program invests in sustainable behaviour change instead of the provision of free or subsidized composters.

3.2.2 Disposal Policies

Regional District of Nanaimo Commercial Food Waste Ban

A waste composition study completed in 2004 for the Regional District of Nanaimo (RDN) confirmed that 35% of total waste sent to landfill was compostable organic material. Consequently, in June 2005, in accordance with the RDN's Zero Waste Plan (2004) and the Organics Diversion Strategy (2005), the RDN introduced a landfill ban on the disposal of food waste from all commercial premises.

This ban was developed and implemented in collaboration with waste haulers, commercial food waste generators and composting companies. This collaborative approach ensured that all stakeholders had at least six months advanced notice.

In particular, waste haulers and their customers were encouraged to devise cost effective systems to comply with the ban that met their individual situation. The RDN's role was to facilitate communication, innovation, competition and compliance, but not get involved in direct program delivery. Enforcement consists of load inspections and surcharges at disposal facilities by RDN staff as well as on-site education and compliance checks by the RDN's Zero Waste compliance officer.

Program results have been positive and economical. In 2006 (the first year of the disposal ban on commercial food waste), over 4,200 tonnes of commercial food waste was diverted from disposal representing a reduction of 30 kg per capita. As a regulator, the RDN does not pay for collection or processing costs, consequently, at an in-house cost of $15 per tonne per year, the commercial organics ban has been an extremely cost-effective local government waste diversion initiative.

Diverting this waste from disposal also contributed to reducing the RDN disposal rate from 553 kg per capita in 2005 to 517 kg per capita in 2006. However, since then this amount has levelled off to an average of 3,400 tonnes annually, which represents a recovery rate of 33% and a reduction of 21 kg per capita per year. Nevertheless, the commercial food waste ban and the organics diversion strategy are recognized as one of the most significant contributors to the RDN's per capita disposal rate of 350 kg in 2012.

Capital Regional District Kitchen Scraps Diversion Strategy

In 2012, the Capital Regional District (CRD) approved a Kitchen Scraps Diversion Strategy that applied to both residential and commercial sectors. The strategy was phased-in over two years. From 2013-2014 the CRD offered a $20 per tonne incentive for haulers to deliver kitchen scraps to approved facilities. In January 2015, the strategy culminated with a full disposal ban on kitchen scraps delivered to the Hartland Landfill. For the ICI sector, private haulers are required to provide food scraps collection services while the residential sector is serviced by a mixture of municipal and private collection services.

Although the CRD had originally secured processing capacity at a private facility in the region, due to odour concerns this option was discontinued and instead food waste is currently transferred to several out-of-region processing facilities. In the meantime, the CRD is investigating options for processing food wastes at the Hartland Landfill. Due to the introduction of the CRD Kitchen Scraps Diversion Strategy, the disposal rate in the CRD declined from 394 kilograms per capita in 2012 to 345 kilograms per capita in 2015.

Metro Vancouver Organics Disposal Ban

Metro Vancouver (MV) also introduced a disposal ban on organics in 2015. From 2012 to 2013 MV staff undertook stakeholder engagement and readiness surveys to inform their detailed planning for an organics disposal ban. In 2014, they announced the Organics Ban Implementation Strategy and continued consultation initiatives prior to the ban effective date of January 2015.

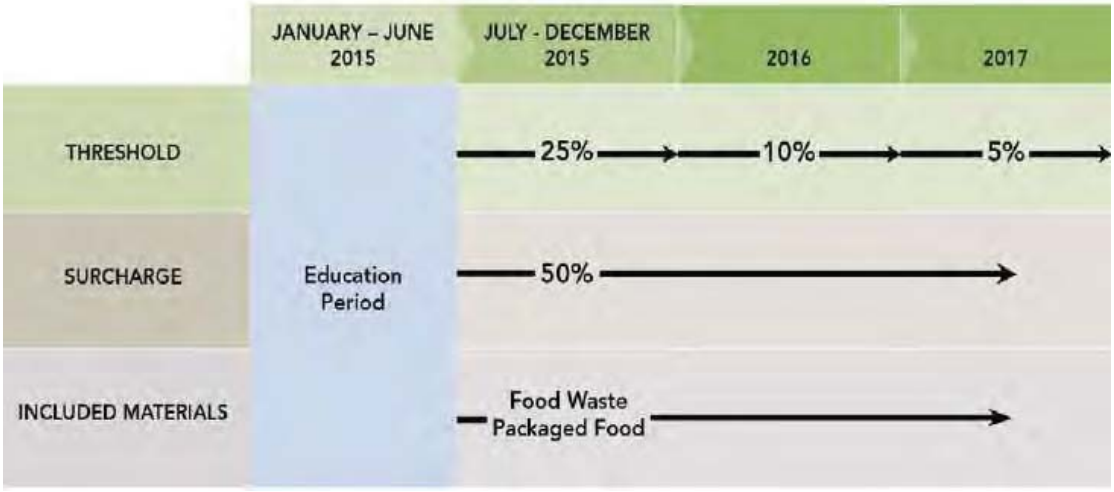
One of the successful components of the Metro Vancouver organics ban was the phased implementation schedule. As indicated in Figure 3-6, for the first six months after the ban was effective, there were no surcharges or penalties applied to loads containing any amount of food waste.

However, following this six-month education period, for the next six months of 2015 any loads containing more than 25 percent food waste were subject to a surcharge of 50% of the MSW tipping fee. The threshold was then reduced to 10 percent in 2016 and 5 percent in 2017.

This declining threshold concept was fully supported by private sector haulers in Metro Vancouver because it allowed them to market their food waste collection services as a “carrot” with the declining threshold as a “stick” to ensure that their customers added separate food waste collection to existing garbage collection service.

Because of the Organics Disposal Ban the per capita disposal rate in Metro Vancouver declined from 520 kilograms per capita in 2014 to 485 kilograms per capita in 2015.

Figure 3-5: Metro Vancouver Organics Disposal Ban Phased Implementation Schedule



3.2.3 Collection Programs

Regional District of Nanaimo Green Bin Collection Program

The Regional District of Nanaimo (RDN) 2004 Zero Waste Plan identified organics diversion as the primary means to reach the goal of 75% diversion from landfill. Commercial and residential food waste diversion programs were essential to achieving this target.

The Green Bin Program, a partnership of the RDN and its member municipalities, was launched in 2010 and provides curbside collection service for food scraps and food soiled paper to over 55,000 single-family households throughout the region, including urban and rural residents.

This was the first large scale residential food waste collection program implemented in BC. Under this program, residents receive weekly collection of food waste and bi-weekly collection of garbage and recyclables on alternating weeks. For garbage, residents can set out one can every other week. For more than one can, residents must purchase tags to set out up to two additional cans every other week.

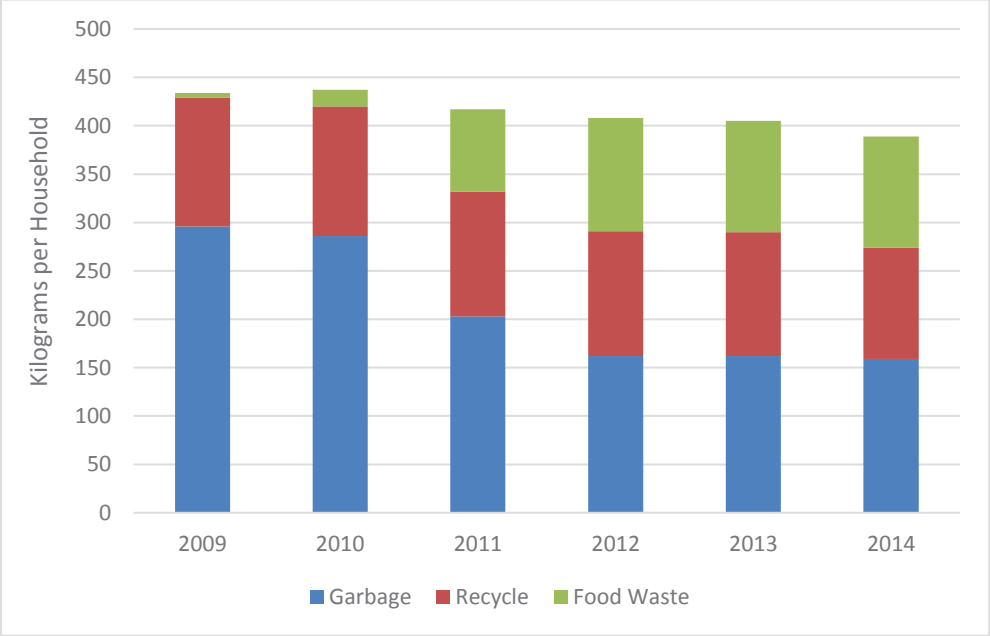
To save on collection costs as well as greenhouse gas emissions, garbage, food waste and recyclables are collected in split packer trucks, whereby food waste and garbage is collected in the same truck one week and food waste and recyclables are collected in the same truck the next week.

In 2012, the program collected 6,247 tonnes of kitchen scraps from 53,500 households. This represents 117 kg of food scraps per household or 43% reduction in waste sent to disposal. This material is processed at a privately owned and operated composting facility in Nanaimo under a long-term contract with the RDN.

With respect to total waste disposal, in 2012 the RDN Green Bin Program diverted 42 kg per capita from landfill, contributing to a region-wide disposal rate of 350 kg per capita.

Figure 3-6 illustrates the reduction in residential garbage disposal per household from 2009 before the program was introduced to 2014 as result of the Green Bin Program.

Figure 3-6: RDN Annual Curbside Tonnage Per Household 2009-2014



Grand Forks Food Scraps Collection Service

The City of Grand Forks and the Regional District of Kootenay Boundary (RDKB) were one of the first BC local governments outside of Lower Mainland/Vancouver Island to provide residents with a Green Bin Food Scraps curbside collection service. The weekly curbside collection service became available to 1,830 City of Grand Forks' households in October 2012. The organic materials are processed in open windrows at the Grand Forks Landfill.

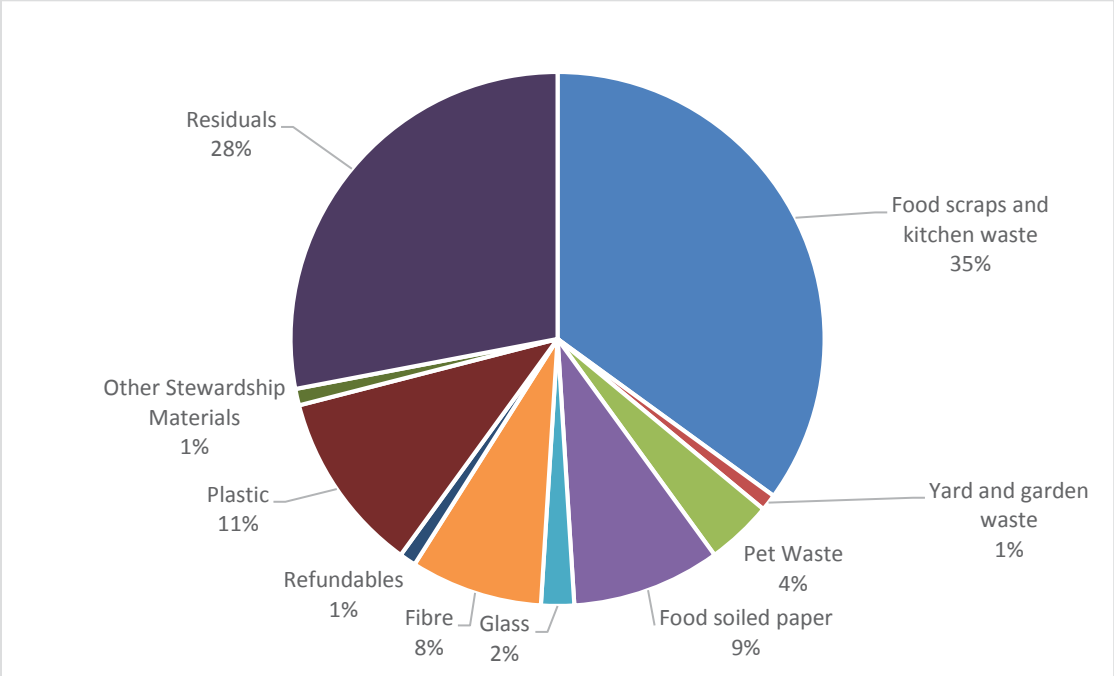
Prior to implementing the green bin program, Grand Forks collected an average of 264 kg of garbage per household per year. After implementation of the program, garbage collected at the curb decreased to 119 kg per household per year. This equates to a 55% reduction in waste sent to disposal. With the collection of 123 kg of food waste per household annually, the overall diversion rate increased from 18% with recycling collection only to 62% with recycling and food waste collection.

3.2.4 Food Waste Diversion Estimate and Impact to Sechelt Landfill

Prior to the implementation of the programs described in previous sections, program designers relied on waste composition data to estimate the quantity of organic waste that could be diverted from disposal. This method relies on two factors: the percentage of residential and ICI organics in the regional district waste stream and the potential recovery rate for both sectors.

While the SCRD has recent waste composition data for the residential waste stream, as illustrated in Figure 3.7, this 2014 study did not assess the composition of the ICI waste stream. This is important since ICI waste represents 50% of total waste disposal in the SCRD. Although ICI waste composition can be extrapolated from other similar regional district studies, actual diversion data from the programs and policies described in this section on best practices can provide a much more reliable estimate of diversion potential.

Figure 3-7: SCRD Residential Waste Composition All Areas 2014



Appendix 3 provides actual food waste data for residential curbside programs operating in the CVRD and RDN. As indicated in Figure 3-3, in 2015 these two regional districts on Vancouver Island had the lowest disposal rates in BC at 297 and 314 kilograms per capita respectively.

Both regional districts implemented disposal bans on commercial sector food waste in 2006, and all households in the RDN and most of the households in the CVRD have curbside food waste collection service. Based on this data it is reasonable to expect that curbside collection of residential organics in the SCRD would divert 52 kilograms per capita of food waste annually.

In lieu of curbside collection, a drop off depot for food waste can be provided. Using data from a pilot drop-off program in the Powell River Regional District, the recovery rate from a residential drop-off program is estimated to be 10 kilograms per capita per year.

With respect to food waste from the ICI sector, based on data from the RDN, it is reasonable to expect that implementation of a ban on disposal of food waste from this sector would divert an additional 30 kilograms per capita per year.

Table 3-1 applies the recovery rate of 52 kilograms per capita for curbside and 10 kilograms per capita for drop-off from the residential waste sector and 30 kilograms per capital from the ICI sector under three scenarios.

Scenario 1

Scenario 1 assumes that the municipalities will proceed with curbside collection service while all the SCRD Electoral Areas will use a drop-off facility. This equates to 877 tonnes of residential food waste and 899 tonnes of ICI food waste for total diversion of 1,776 tonne per year.

Scenario 2

Scenario 2 assumes that the municipalities will proceed with curbside collection service while the SCRD Service will expand to include food waste collection in Electoral Areas B and D, while Electoral Areas A, E, and F will rely on a food waste drop-off site. In this scenario, residential food waste diversion increases to 1,152 tonnes per year which combined with ICI food waste represents a total diversion of 2,051 tonnes of food waste annually.

Scenario 3

Scenario 3 assumes that the municipalities will proceed with curbside collection service while SCRD Service will expand to include food waste collection in Electoral Areas B, D, E and F while Electoral Area A relies on a food waste drop-off site. In this scenario, residential food waste diversion increases to 1,400 tonnes per year, which combined with ICI food waste represents a total diversion of 2,300 tonnes per year.

Consequently, the total amount of food waste that could be diverted as feedstock to the Salish Soils composting facility could range from between 1,776 tonnes per year for Scenario 1, to 2,050 for Scenario 2, an up to 2,300 tonnes per year for Scenario 3.

Impact to Sechelt Landfill

The SCRD's landfill engineers, XCG Environmental Consultants (XCG) project that the diversion estimates under these three scenarios would provide eleven, thirteen and fifteen months respectively of additional site life at the Sechelt Landfill.

Table 3-1: Food Waste Diversion Scenarios and Impact to Sechelt Landfill

Sector	Households	Persons/ HH	Est. Pop	Scenario 1 (tonnes)	Scenario 2 (tonnes)	Scenario 3 (tonnes)
Residential						
Municipal						
Sechelt District Municipality	4,305	2	9,041	470	470	470
Town of Gibsons	2,056	2	4,318	225	225	225
Sechelt Indian Government District	273	2	628	33	33	33
Municipal Sub-Total				727	727	727
Electoral Areas						
EA B - Halfmoon Bay	1,351	2	2,973	30	155	155
EA D - Roberts Creek	1,627	2	3,579	36	186	186
EA E - Elphinstone	1,675	2	3,686	37	37	192
EA F - West Howe Sound	1,022	2	2,247	22	22	117
EA A - Pender Harbour/Egmont	1,385	2	2,493	25	25	25
Electoral Area Sub-Total				*150*	*425*	*674*
Residential Total				**877**	**1,152**	**1,401**
ICI (@30 kg per capita)						
ICI Total			**29,970**	**899**	**899**	**899**
TOTAL All SECTORS				**1,776**	**2,051**	**2,301**

	Scenario 1 (Months)	Scenario 2 (Months)	Scenario 3 (Months)
Additional Site Life at the Sechelt Landfill	11	13	15

4 Community and Stakeholder Engagement Process

A successful regional organics diversion strategy requires input from all stakeholders including processors, haulers, local governments, and waste generators in the area. This section summarizes the results of the stakeholder engagement process undertaken to date to inform the development of the strategy.

4.1 Processors

As discussed in Section 2.5, Salish Soils operates a composting facility in Sechelt. The Project Team has visited the site and has had several conversations with the Chief Executive Officer, Aaron Joe. Salish Soils is currently operating under capacity and would welcome the additional feedstock that would be available as result of the final SCRD Regional Organics Diversion Strategy.

Although Salish Soils has adequate processing capacity for food and green waste from residential and commercial sources, they would appreciate the added support provided by disposal bans and long-term contracts for feedstock supply. This is the case with most private sector operators. Without adequate feedstocks to operate at design capacity, cash flows are insufficient to provide the necessary funds for equipment maintenance and repair let alone any return on investment. Without long-term processing contracts private facilities have difficulty borrowing funds required for facilities upgrades and improvements, particularly with respect to odour control. These concerns are shared by Salish Soils.

4.2 Haulers

The Project Team contacted three garbage hauling companies operating in the Sunshine Coast, Grayco, Direct Disposal and Harbour Disposal. Both Grayco Disposal and Direct Disposal expressed support for increased organics diversion programs and are confident that their firms could provide food waste collection services for both the residential and ICI sectors. However, Harbour Disposal advised that if commercial food waste was banned from disposal region-wide they would need to purchase a new truck and would require a drop-off option at the Pender Harbour Transfer Station, given their unwillingness at this point to haul food waste to Sechelt.

Although Direct Disposal voiced support for a ban on commercial food waste, they are concerned that any additional feedstock to the Salish Soils composting facility will exacerbate odour issues at the facility. This is a legitimate concern and will need to be addressed in the development of the regional organics diversion strategy. See Section 5.3 for more details.

4.3 Local Governments

In May 2017, the SCRD coordinated a meeting with staff from the District of Sechelt, the Town of Gibsons and the Sechelt Indian Government District to discuss the development of the regional organics diversion strategy. At this meeting, the Project Team provided a high-level overview of the strategy development process and timelines while the member municipalities provided an update on their plans to implement curbside collection of food waste in their respective jurisdictions.

At the meeting Town of Gibsons staff mentioned that they were drafting a survey for residents to obtain input on curbside or depot collection of food waste.

Since the meeting the Town has issued a residential survey and a request for proposals (RFP) for a residential organic waste diversion program. The survey closed on June 30, 2017. The RFP, which closes July 14, 2017, is for a turnkey collection program whereby the successful proponent provides: a communication strategy, an education awareness program, collection methods, equipment required including kitchen and curbside containers, hauling methods and costs, and identifies the permitted processing facilities.

The Town of Gibsons anticipates awarding a contract by September 1, 2017 with service to commence the first week of October 2017. The expiration of the contract arising from this RFP is to coincide with expiration of the Town's curbside garbage collection contract in February 28, 2018.

As discussed in Section 2.3, the District of Sechelt has been operating a food waste collection pilot in the Davis Bay area for several years. District staff present at the meeting advised that Davis Bay residents support the service but may not be willing to pay the extra costs associated with a full roll-out. Due to resource constraints, staff have not been able to proceed with developing a proposal for Council consideration on District-wide curbside organics collection. This should be addressed within the next year.

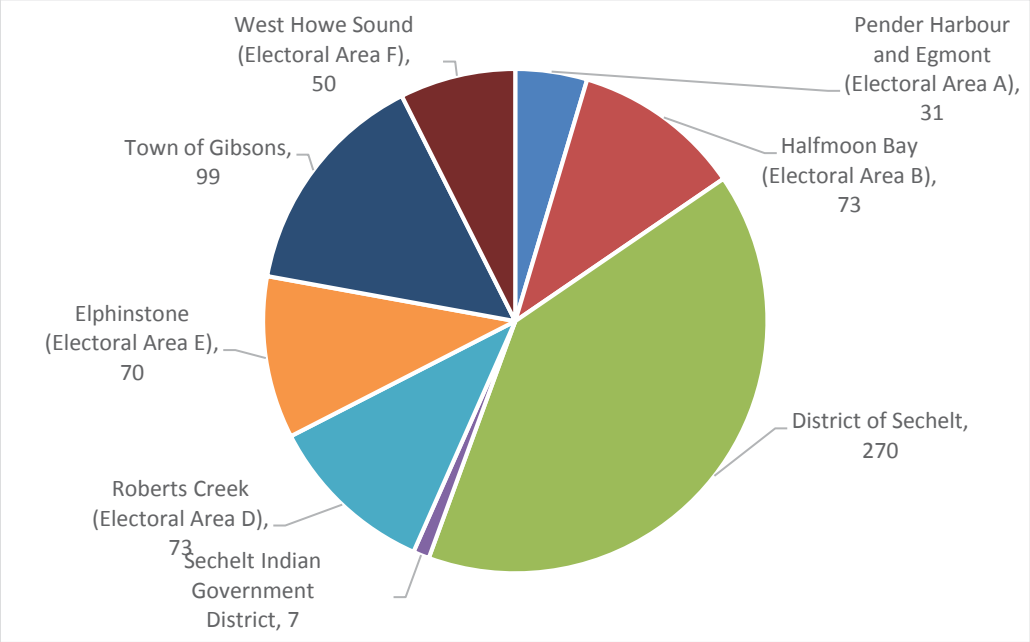
The Sechelt Indian Government District Council approved a Zero Waste plan last year and will be hiring an educator to support the initiative. The SIGD currently provides weekly garbage and weekly recycling services to their residents. However, SIGD staff are currently reviewing options for weekly collection of food waste and bi-weekly collection of garbage and recyclables.

Based on this meeting, municipalities within the SCRD are considering the provision of curbside collection of food waste to their residents. However, with respect to green waste, municipal partners have not expressed an interest in collecting this material at the curb and are content to continue the current system of self-haul to SCRD drop-off depots.

4.4 Residents

From May 8, 2017 to June 2, 2017, the SCRD asked residents to respond to a questionnaire about their current organic waste management practices, their willingness to participate in depot and curbside organic waste collection services, and their concerns about these collection methods. A total of 673 people responded. The distribution of responses by area is illustrated in Figure 4.1

Figure 4-1: Distribution of Questionnaire Response by Area



The questionnaire results indicate a high level of current participation in green waste diversion, including backyard composting and drop-off depots. Detailed information on the questionnaire is outlined in the Public Engagement Report – Organics Diversion Questionnaire.

For food waste management, a wide variety of solutions are used –ranging from backyard composting to feeding animals to using drop-off depots. Table 4.1 shows the prevalence of backyard composting of acceptable food scraps (fruits, vegetables, coffee grounds etc.) and depot use (all food scraps), by area, based on the responses to the questionnaire. There is a significant difference in the prevalence of backyard composting between the Electoral Area respondents (over 50%) and the municipal respondents (36% or less). Depot participation ranged from 3% in Electoral Area A (Pender Harbour) to 14% in the SIGD.

Table 4-1: Backyard Composting and Depot Use by Area

	Backyard Compost Food Scraps (% of area respondents)	**Take Food Scraps to Depot** (% of area respondents)	**Put Food Scraps in the Garbage** (% of area respondents)
Area A	55%	3%	65%
Area B	52%	11%	82%
Area D	55%	7%	77%
Area E	57%	6%	86%
Area F	54%	6%	66%
SIGD	0%	14%	86%
Gibsons	36%	6%	91%
Sechelt	32%	7%	82%

The respondents' willingness to participate in curbside organic waste collection services was high in all areas. Table 4.2 shows the percentage of respondents in each area that indicated that their participation would be "highly likely" or "maybe". Except for respondents in Areas A and F, there was generally a higher level of support for curbside collection over depot-based collection.

Table 4-2: Questionnaire Respondents Willingness to Participate in Organic Waste Collection

	Depot Collection			Curbside Collection		
	Highly likely	Maybe	Total	Highly likely	Maybe	Total
	% of respondents, by area					
Area A	61	26	87	55	16	71
Area B	27	36	63	75	14	89
Area D	36	30	66	67	14	81
Area E	46	33	79	66	19	85
Area F	52	24	76	56	16	72
SIGD	57	14	71	86	0	86
Gibsons	49	30	79	83	7	90
Sechelt	29	36	65	82	9	89

The most common concern expressed by respondents was the creation of animal attractants, particularly for bears. Many respondents suggested a willingness to participate in curbside collection if an animal-proof bin could be provided. The other commonly expressed concerns were the cost of the service and the potential for odour, although these concerns were identified with much less frequency than concerns related to attracting animals.

5 Considerations for Strategy Development

To ensure that a sustainable and robust organics diversion program is implemented in the SCRD, environmental, economic and social issues must be given full consideration in the development and selection of a regional organics diversion strategy. The following section outlines the Project Team's understanding of these issues in the SCRD as well as their implications on strategy development.

5.1 Sechelt Landfill Considerations

Landfill Capacity

According to the 2016 Annual Report prepared by XCG Consulting Limited, the Sechelt Landfill will reach capacity in 2027 based on current disposal rates, diversion initiatives, and population projections. If the SCRD fully implements all of the diversion initiatives outlined in the 2011 SWMP, landfill capacity could be extended another 5 years to early 2032. In either case, the SCRD will need to identify additional long-term disposal capacity and in the Project Team's experience this will be a challenging process that will inevitably result in higher disposal costs.

A lack of or shortage of landfill capacity was one of the main drivers for the CVRD and the RDN to implement their organics diversion programs. The CVRD currently exports their residual wastes in response to an unsuccessful landfill siting process. Given the high cost associated with waste export, the

CVRD has pursued a full range of diversion initiatives to reduce their residual disposal costs. The RDN also faced a landfill capacity crisis and after a controversial and failed landfill siting process, chose to conserve existing capacity by promoting maximum waste diversion.

Greenhouse Gas Emissions

As discussed in the 2011 SWMP, the Sunshine Coast Regional District, Town of Gibsons, District of Sechelt and the Sechelt Government District are committed to reducing greenhouse gas (GHG) emissions for the region. An emissions inventory completed in 2009 shows that the Sechelt Landfill contributes roughly 7% of GHG emissions on the Sunshine Coast. Since food waste generates methane, a potent greenhouse gas, during decomposition in a landfill, diverting this waste to a composting facility provides not only a significant reduction in GHG emissions, but also provides residents a low-cost and easy option to address climate change by reducing their household GHG emissions. Consequently, from an environmental perspective, the region wide organics diversion strategy should aim to maximize the diversion of food waste as an effective and efficient means to reduce GHG emissions.

5.2 Supporting Policy Considerations – Disposal Bans

Organic waste disposal bans have proven to be an effective and low-cost policy tool to divert waste and reduce GHG emissions in Metro Vancouver, Capital, Cowichan Valley and Nanaimo regional districts. However, the application of disposal bans for the ICI and residential sectors has varied between regional districts for the reasons discussed below.

In 2005 the RDN and CVRD were the first regional districts in BC to implement disposal bans on food wastes. In both cases the bans applied to commercial food waste and not food waste from the residential sector. This was due to two factors: the availability of privately owned and operated composting facilities and the fact that commercial food waste generators and private haulers could move faster to implement collection programs than local government service providers in the residential sector.

In the RDN, the commercial organics ban achieved significant and early diversion success while providing staff the opportunity to study collection options for the residential sector. This included implementation of a successful curbside collection pilot project. As a result, curbside collection services operated by the City of Nanaimo and the RDN expanded to include food waste in 2010. However, the commercial disposal ban has not been expanded to apply to residential waste since collection services were implemented voluntarily.

In Metro Vancouver and the CRD, the organics disposal bans, effective in 2015, apply to both the commercial and residential sectors. However, because these regional districts do not provide residential curbside garbage collection programs, they allowed for a two-year consultation process with their municipal partners and commercial generators to ensure support for their initiatives. Once municipal support was confirmed, the effective date for the ban was established and implemented in a phased process. In effect, these bans applied to commercial and residential organics because member municipalities were supportive and were given sufficient time to design and implement their collection systems.

5.3 Odour Management at Salish Soils

As discussed in Section 2.5, the Salish Soils composting facility meets the requirements of the Organic Matter Recycling Regulation (OMRR), which falls under the Environmental Management Act. The OMRR governs the production, quality and land application of certain types of organic matter. OMRR sets requirements for compost facilities with respect to:

- Construction and operation;
- Leachate management;
- Odour management;
- Capacity, and,
- Process and quality criteria.

For facilities that process less than 20,000 tonnes per year, OMRR requirements are not too stringent. For facilities that process more than that amount, requirements become more rigorous. Nevertheless, because OMRR requirements were not site specific at the time, the RDN, CVRD, Metro Vancouver and the CRD have all applied their Waste Stream Management Licensing Bylaws or Composting Code of Practice Bylaw to set higher performance standards than OMRR for composting facilities in their regions. This was primarily due to concerns over odour management, which is crucial to successful organic diversion.

In 2016, with more composting facilities expected to come online, OMRR was amended to ensure effective protection of the environment and public health. The amended OMRR requires all compost facilities that process food waste or biosolids, and have a production design capacity to produce 5,000 tonnes of compost or more per year to also apply for a Permit. These new permit requirements include completion by the applicant of an Environmental Impact Study, an Operating Plan, an Odour Management Plan, a Leachate Management and a Public Notification Process.

Although the Salish Soils facility is not subject to OMRR, the company has met all the requirements of the regulation for a facility of its size. And even though its production design capacity is less than 5,000 tonnes of compost per year, Salish Soils has advised the Project Team that they would be willing to apply for a permit under OMRR. Although this would be in the best interests of the SCRD, the permit requirements are expensive and Salish Soils would need to see a corresponding increase in feedstock and associated revenue. Consequently, the regional organics diversion strategy must consider due diligence requirements with respect to environment and public health protection as well ensuring that Salish Soils has the financial ability to meet these requirements.

With respect to processing costs, it is likely that the current Salish Soils tipping fee of $80 per tonne for large quantities will increase to meet permit requirements. The tipping fees at similar composting facilities in BC are closer to $100 per tonne to cover higher operating and maintenance and equipment replacement costs, particularly with respect to odour control.

5.4 Geography and Demographics

Communities and settlements in the SCRD are primarily strung out along a long and linear corridor that runs along the southern coastline. This has an impact on waste management infrastructure with respect to the need for drop-off and transfer facilities for communities outside of a reasonable hauling distance to the Sechelt Landfill or, for organics, to the Salish Soils composting facility in Sechelt. There is also the need to consider access to drop-off facilities for island residents as well as tourists and other seasonal visitors. Geography also dictates the need to mitigate bear human conflict with respect to garbage collection and disposal.

5.5 Community Support

Community support is essential to a successful organics diversion program. As discussed in Section 4.4, based on the results of the community questionnaire there is a high-level support for curbside collection of food waste in the SCRD. Nevertheless, residents have expressed concern over cost and wildlife concerns. The regional organics diversion strategy should take these concerns into consideration to ensure that most residents and businesses support food waste diversion.

6 Draft Regional Organics Diversion Strategy

Based on the considerations discussed above, the Project Team recommends the following strategy to divert food waste from the Sechelt Landfill. This strategy contains initiatives related to, commercial sector diversion, reduction and residential sector diversion. The estimated costs and implementation schedule is provided in Table 6-1.

Commercial Food Waste Ban

1. Implement a commercial food waste ban.
2. Implement food waste drop-off at the Pender Harbour Transfer Station.
3. Continue feasibility work on developing a South Coast site that includes food waste drop-off.

Reduction Programs

4. Implement a Food Waste Reduction Campaign.
5. Implement an at-home Compost Coaching Program.
6. Investigate a Backyard Composter Subsidy Program.

Residential Food Waste Collection

7. Implement curbside collection of food waste for all SCRD residences receiving garbage collection for a March 1, 2019 start.

Table 6-1: Regional Organics Diversion Strategy Costs and Implementation Schedule

	Action	Cost Estimate	Schedule
1.	Implement a commercial food waste ban.	Staff	2018
2.	Implement food waste drop-off at the Pender Harbour Transfer Station.	$10,000	2018/2019
3.	Continue feasibility work on developing a South Coast site that includes food waste drop-off.	TBD	2019
4.	Implement a Food Waste Reduction Campaign.	$10,000	2019
5.	Implement at-home Compost Coaching Program.	$10,000	2019
6.	Investigate a Backyard Composter Subsidy Program.	TBD	2019
7.	Implement curbside collection of food waste for all SCRD residences receiving curbside collection of garbage for a March 1, 2019 start.	TBD	2019

Appendix 1: Notes to the Financial Statements for the Years Ended December 31, 2016 and 2015.

Sunshine Coast Regional District

Notes To The Financial Statements
For the Years Ended December 31, 2016 and 2015

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9. Provision for Landfill Future Closure and Post-Closure Care Costs:

The Regional District is responsible for the closure and post-closure care costs related to two landfill sites - one in Sechelt and the other in Pender Harbour. The Regional District's estimated liability for these costs is recognized as the landfill site's capacity is used. The recorded liability of $5,245,705 (2015 - $4,803,825) represents the portion of the estimated total future costs recognized as at December 31, 2016. The Regional District has set aside funding for future landfill closure and post-closure care costs. The balance of this funding as at December 31, 2016 is $508,745 (2015 - $208,109) resulting in a current funding shortfall of $4,736,960 (2015 - $4,595,716).

The Sechelt landfill site is expected to reach its capacity in 2027 and the Pender Harbour landfill site reached its capacity and was converted to a transfer station in 2015. The remaining liability to be recognized for the Sechelt landfill site is estimated to be $1,534,086 (2015 - $1,632,509) based on the remaining capacity of 212,428 cubic meters, which is 24.17% of the total capacity. As the Pender Harbour landfill site reached its capacity in 2015, there is no remaining liability to be recognized.

The reported liability is based on estimates and assumptions with respect to events extending over the remaining life of the landfill. The liability and annual expense is calculated based on the ratio of usage to total capacity and the discounted estimated future cash flows associated with closure and post-closure activities. In 2016, the Regional District updated the basis for estimating future cash flows to reflect long-term average inflation and discount rates applicable to the Regional District. The impact of this change was a decrease to the recorded liability in 2016 of $225,382.

In 2016, the BC Ministry of Environment issued updated landfill criteria increasing the minimum post closure care period from 25 years to 30 years. As such, post closure care costs are now expected to continue for 30 years following the year of closure at both the Pender Harbour and Sechelt Landfill sites. The impact of this change was an increase to the recorded liability in 2016 of $247,426.

Appendix 2: Organics Diversion Programs in Comparable AVICC Regional Districts

A2 1: Organics Diversion Programs in Comparable AVICC Regional Districts

Program Characteristics	CRD	CVRD	RDN	SCRD	PRRD
2016 Population	382,645	84,014	157,599	29,243	20,328
Population Density (Pop/km^2)	154	23	72	8	4
2015 Per Capital Disposal (kg)	345	297	314	421	458
MSW Tipping Fee	$110	$140	$125	$150	$220
Green Waste Tipping Fee	$59	Free	$55	$0/$45	$45
Food Waste Tipping Fee	$120	$90	$110	$80	Pilot/Free
Curbside Collection Services:					
Garbage	Bi-Weekly	Bi-Weekly 1 can	Bi-Weekly 1 can	Weekly 1 can	Weekly Tag Based Powell River Only
Food Waste	Weekly/Bi-Weekly Varies by Municipality	Weekly	Weekly	Pilot Pick-up Sechelt only	Pilot Drop-Off
Green Waste	Varies by Municipality	Depot	Depot	Depot Pilot Pick-up Sechelt only	Depot
Recycle	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-weekly Sechelt & SIGD only	Bi-Weekly Powell River Only
Depot – recycle	Yes	Yes	Yes	Yes	Yes
In-region compost facility	No	Yes	Yes	Yes	No
Organics Ban – ICI	Yes	Yes	Yes	No	No
Organics Ban – Residential	Yes	No	No	No	No
Organics Strategy/Plan	Yes	Yes	Yes	In development	In development

Appendix 3: Food Waste Diversion Estimates

Table A3-1 provides actual food waste diversion data for residential curbside programs operating in the CVRD and the RDN. As indicated in Figure 3-3, these two regional districts on Vancouver Island have the lowest disposal rates in BC at 297 and 314 kilograms per capita respectively. Both regional districts implemented disposal bans on commercial sector food waste in 2006, and all households in the RDN and most of the households in the CVRD have curbside food waste collection service. Based on this data it is reasonable to expect that curbside collection of organics in the SCRD would result in similar diversion results.

Table A3 1: Residential Food Waste Diversion Data in the CVRD and RDN

Curbside Program	Households	Person/HH	Est. Pop	Food Waste		
				Tonnes/yr	kg/hh/yr	kg/cap/yr
RDN						
City of Nanaimo	27,600	2.3	63,480	3,505	127	55
RDN Service Area	28,130	2.2	61,886	3,151	112	51
Total	55,730		125,366	6,656	119	53
CVRD						
Town of Ladysmith	3,410	2.3	7,843	436	128	56
District of North Cowichan	10,640	2.3	24,472	1,075	101	44
Total	14,050		32,315	1,511	108	47
				Average	**117**	**52**

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – September 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **TIMELINE FOR THE DRAFT REGIONAL ORGANICS DIVERSION STRATEGY**

RECOMMENDATION(S)

THAT the report titled Timeline for the Draft Regional Organics Diversion Strategy be received;

AND THAT the Timeline for the Regional Organics Diversion Strategy be adopted.

BACKGROUND

Diversion of organics has been identified as a priority to extend the lifespan of the Sechelt Landfill and to meet the targets set out in the SCRD's 2011 Solid Waste Management Plan (SWMP).

A Draft Regional Organics Diversion Strategy was developed by Carey McIver and Associates Ltd. and presented at the July 20, 2017 Infrastructure Services Committee Meeting. The resulting recommendations were subsequently adopted at the July 27, 2017 Board Meeting as follows:

242/17 Recommendation No. 3

THAT staff report on a possible landfill ban on residential organics in 2020 and beyond.

242/17 Recommendation No. 4

THAT staff report on an Organics Strategy Implementation Plan in Q4 2017;

AND THAT Compost Coaching and Food Waste Reduction Programs be considered for inclusion in 2018 Budget deliberations;

AND FURTHER THAT consideration be given to partnerships with stakeholders for the implementation of on-site Compost Coaching.

242/17 Recommendation No. 5

THAT forthcoming staff reports and communication plans identify rural best practices with regards to wild animal welfare for both backyard composting and curbside pickup.

242/17 Recommendation No. 7

AND THAT the Draft Regional Organics Diversion Strategy be adopted;

AND THAT the strategy be maintained in draft form until an implementation plan is developed and approved;

AND FURTHER THAT recommendations from the Draft Regional Organics Diversion Strategy that require funding be brought forward to the 2018 and 2019 budgets.

The purpose of this report is to provide a Timeline for the Draft Regional Organics Diversion Strategy.

DISCUSSION

The timeline considers both the priorities identified in the Strategy and the 242/17 Board recommendations. It is intended to be a high-level guiding document that lists the main tasks required to fulfill each priority, with their associated timing and phases.

The timeline specifically addresses the Board recommendations regarding compost coaching, food waste reduction programs and a possible landfill ban on residential organics. After much consideration when reviewing the priority items of the Strategy and associated timelines, compost coaching and food waste reduction programs were placed in 2019 and a possible landfill ban on residential organics in 2020.

Although the Strategy recommends residential curbside collection for residences in Areas currently receiving curbside garbage collection, the timeline provides for interim drop-off at two locations while the planning process is underway for a potential 2019 curbside program. This also ensures equitable service for all residents as the recommended approach for organics diversion for Electoral Area A (Pender Harbour/Egmont) is drop-off.

The timeline is intended to be a living document and will be updated as required.

The timeline begins in Q4 2017. However, the timeline is reliant upon several process steps first being completed, and any delays in these initial steps will result in a corresponding delay in starting the Plan. The initial process is summarized in Table 1.

Table 1 – Process Required for Strategy Implementation

Process Required Prior for Strategy Implementation	Status	Date
Develop Regional Organics Diversion Strategy	Completed	Jul 2017
Board Adoption of Strategy	Adopted as Draft	Jul 27, 2017
Board direction to develop Timeline	Completed	Sep 2017
Board Adoption of Timeline	In Progress	Sep 21, 2017 ISC Oct 12, 2017 Board
Workshop with member municipal Councils and SCRD Board	Started	Oct 24, 2017
Board Adoption of Strategy	Not Started	Nov 16, 2017 ISC Nov 23, 2017 Board
Begin Implementation of Strategy	Not Started	Dec 2017

Financial Implications

Each component of the Draft Regional Organics Diversion Strategy will require a separate budget to be developed. Actual budgets are dependent on options and approaches selected and level of participation by Electoral Areas and member municipalities. Capital and operational budgets will be refined and finalized as the implementation plan proceeds and brought forward to the 2018 and 2019 Budgets as required.

Timeline for next steps

The next step after Board adoption of the timeline, and subsequently the Strategy, is to secure long-term legal contracts with a processor and a hauler. Any delay in securing contracts will shift the timeline as it the driver for most of the remaining actions of the Strategy.

Communications Strategy

A communication plan will be developed for each component of the Strategy and is identified in the Timeline.

STRATEGIC PLAN AND RELATED POLICIES

A Regional Organics Diversion Strategy supports the Strategic Priority of Embed Environmental Leadership.

The Strategy is in support of the SCRD's Solid Waste Management Plan's target of 65%-69% diversion and organics diversion is one of the SWMP's reduction initiatives.

CONCLUSION

The Draft Regional Organics Diversion Strategy was developed in response to a need to extend the lifespan of the Sechelt Landfill and help meet the targets in the SCRD's Solid Waste Management Plan.

The first step after Board adoption of the Draft Strategy was to develop a timeline. As such, a comprehensive timeline of high level tasks required to launch each priority of the Draft Strategy has been completed.

After Board adoption of the timeline, and subsequently the Strategy, the work will begin as identified in the Timeline.

ATTACHMENT – Timeline for the Draft Regional Organics Diversion Strategy

Reviewed by:			
Manager	X-R.Cooper	Finance	
GM	X-M. Day	Legislative	
CAO	X-J.Loveys	Other	

Draft Regional Organic Waste Diversion Strategy		2017		2018				2019				2020				2021			
Priority	Implementation Actions and Timeline	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
#1	**Establish Food Waste Contracts**																		
	Regulatory review																		
	Procurement process for processing																		
	Procurement process for hauling																		
	Board decision reports																		
#2	**Commercial Food Waste Drop-off at Pender Harbour Transfer Station**																		
	Establish and implement food waste drop-off																		
	Promote program as part of Commercial Food Waste Ban process																		
	Evaluate effectiveness (Waste Composition Study)																		
#3	**Commercial Food Waste Ban**																		
	Pre-ban consultation and education with haulers and ICI sector																		
	Develop communications materials																		
	Bylaw amendment, Board decision report																		
	Implement ban: Phase 1 Education and Awareness																		
	Implement ban: Phase 2 Enforcement																		
	Ongoing ban communications, enforcement																		
	Evaluate effectiveness (#Waste Composition Study)																		
#4a	**Residential Food Waste Drop-Off at Pender Harbour Transfer Station**																		
	Establish and implement food waste drop-off																		
	Ongoing communications, service delivery, continuous improvement																		
	Evaluate effectiveness (Waste Composition Study)																		
#4b	**Residential Food Waste Drop-Off in Sechelt – interim option**																		
	Develop options for drop-off																		
	Board decision report																		
	Promote and implement program																		
	Ongoing communications, service delivery, continuous improvement																		
	Evaluate effectiveness (Waste Composition Study)																		
#4c	**Residential Food Waste Drop-Off for South Coast – interim option**																		
	Develop options for drop-off																		
	Board decision report																		
	Promote and implement program																		
	Ongoing communications, service delivery, continuous improvement																		
	Evaluate effectiveness (Waste Composition Study)																		
	Undertake feasibility work on South Coast site to include food waste drop-off																		
#5	**Curbside Collection of Food Waste**																		
	Program planning and best practices including wildlife management																		
	RFP for curbside collection of garbage & food scraps* (bear resistant cart)																		
	Board decision report																		
	Bylaw amendment,* Board decision report																		
	Program promotion and launch*																		
	Ongoing communication, service delivery, enforcement, continuous improvement*																		
	Evaluate effectiveness (Waste Composition Study)																		

Draft Regional Organic Waste Diversion Strategy		2017		2018				2019				2020				2021			
Priority	Implementation Actions and Timeline	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
#6	**At-Home Compost Coaching Program**																		
	Program planning, including community based social marketing																		
	Board decision reports, including 2019 budget consideration																		
	Program promotion and launch																		
	Program evaluation and continuous improvement																		
	Ongoing communication and program delivery																		
#7	**Investigate Backyard Composter Subsidy**																		
	Best practice research, options and link to Compost Coaching																		
	Board decision reports, including 2019 budget consideration																		
	If approved, program promotion and launch																		
	Program evaluation and continuous improvement																		
	Ongoing communication and program delivery																		
# 8	**Food Waste Reduction Campaign**																		
	Program planning, including community based social marketing																		
	Board decision reports, including 2019 budget consideration																		
	Program promotion and launch																		
	Program evaluation and continuous improvement																		
	Ongoing program delivery																		
#9	**Waste Composition Study**																		
	Item included in 2020 financial process																		
	Procurement process for consultant services to complete study: Residential, ICI, drop-off bins																		
	Waste Audit #1																		
	Waste Audit #2																		
	Final Report received																		
	Board report for information																		
#10	**Residential Food Waste Ban**[1]																		
	Evaluate results of Waste Composition Study & implications of ban																		
	Board decision report																		

Timeline Legend

The timeline following uses these indicator colours to assist in understanding the nature and breakdown of each task.

Board Report	
Program Launch	
Planning and Design	
Conducting the Work	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **SOLID WASTE WORK PLAN – UPDATE FOR 2018**

RECOMMENDATION(S)

THAT the report titled Solid Waste Work Plan – Update for 2018 be received;

AND THAT the Solid Waste Work Plan be approved.

BACKGROUND

There is significant interest in solid waste on the Sunshine Coast, driven by the limited life span of the Sechelt Landfill, which is estimated to be ten to twelve years with business as usual.

Given that substantive decisions which need to be made by the Sunshine Coast Regional District (SCRD) Board soon on how to proceed with bans, bylaw updates and program delivery options, two solid waste workshops with local governments were held to listen, gather and discuss how to move forward. The first workshop was held on March 2, 2017 as a Special Infrastructure Services Committee (ISC) Meeting and the second was an Elected Officials Solid Waste Workshop held on October 24, 2017.

The Special ISC identified short-term and long-term Board priorities and the Elected Officials Solid Waste Workshop resulted in agreed upon direction for regional programming and services. Along with the SCRD's Solid Waste Management Plan, these priorities and direction guide the Solid Waste work plan.

The purpose of this report is to update the Board on the SCRD Solid Waste Work Plan and highlights key timelines and decisions required in 2018.

DISCUSSION

Staff have prepared an updated SCRD Solid Waste work plan for 2018 that incorporates the short-term priorities identified at the Special ISC and what was agreed upon at the Elected Officials Solid Waste Workshop.

The agreed upon top priority is to extend the life of the Sechelt Landfill. Work plan items include a regional disposal ban for recycling and commercial organics, implementation of the Regional Organics Diversion Strategy, as well as to investigate engineering options for increased capacity.

Also in 2018, decisions regarding contracted services for curbside collection, depot recycling and green waste are required to ensure service. As such, the work plan identifies when Board reports are expected to come forward concerning these programs and services.

The work plan is included as Attachment A.

Next Steps

The work plan will be updated as Board decisions are made as some decisions have a cascading effect on others. In addition, some of the work is concurrent and sequenced. Changes to the overall work plan has impacts on future decision points.

STRATEGIC PLAN AND RELATED POLICIES

This report is in support of the key strategic priority of Embed Environmental Leadership and the Solid Waste Management Plan.

CONCLUSION

A special Infrastructure Services Committee Meeting was held on March 2, 2017 and an Elected Officials Solid Waste Workshop was held on October 24, 2017.

Staff have prepared an updated SCRD Solid Waste work plan for 2018 that incorporates the short-term priorities identified at the Special ISC and what was agreed at the Elected Officials Solid Waste Workshop.

The work plan is included as Attachment A.

ATTACHMENTS

Attachment A – SCRD Solid Waste Work Plan - 2018

Reviewed by:			
Manager		Finance	
GM		Legislative	
CAO	X-J. Loveys	Other	

Date: December 13, 2017

ATTACHMENT A

SCRD Solid Waste Work Plan – 2018	2018												2019		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Solid Waste Management Plan															
5 Year Effectiveness Review															
Sechelt Landfill Capacity															
Install metal plates as alternate daily cover															
Tipping Fee Review Results – Report															
Bylaw 405 amendments - Report															
Investigate Engineering Options for Landfill Capacity	R1														
Implement bans as approved (see below)															
New landfill site preliminary investigation	R1														
Bans – Commercial Organics, Recycling															
Implementation Plan - Report															
Stakeholder Engagement															
Implementation Plan Revision - Report															
Bylaw 405 amendment - Report															
Launch: Phase 1 Education & Awareness															
Launch: Phase 2 Enforcement															
Curbside Collection Services															
Service level & type e.g pay-as-you-throw – Report															
Issue RFP															
Contract award - Report															
Bylaw 431 amendment (if applicable) - Report															
Develop Outreach and Education Materials															
Conduct Outreach and Education															
Launch															
Organics Diversion – as per Draft Strategy															
Adoption of Strategy as Final – Report															
Long-term legal contract with processor & regulatory review	Refer to Draft Regional Organics Diversion Strategy Implementation Actions & Timeline *(will be updated accordingly following adoption)*														
Commercial Ban															
Commercial drop-off at PHTS															
Residential drop-off at 3 locations															
Curbside collection of food waste in EA's B, D, E, F															
At-home Compost Coaching Program															
Investigate Backyard Composter Subsidy															
Food Waste Reduction Campaign															
Residential Food Waste Ban Investigation – 2020															

SCRD Solid Waste Work Plan – 2018 *continued*	**2018**												**2019**		
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Regional Recycling – Depots															
Recycle BC Update – Report															
Contract & Service Options - Report															
Green Waste															
Contract & Service Options – Report															
Illegal Dumping															
Illegal Dumping Update - Report															
Backroad Trash Bash, Pender Harbour															
Waste Reduction Initiatives Program															
2016 Project Outcomes – Report															
2018 Call for Applications, Close & Evaluate															
2018 Recipients Announcement – Report															
2017 Project Outcomes – Report															
2018 Project Outcomes - Report															
Islands Clean Up															
Islands Clean Up Service															

Timeline Legend

The timeline uses these indicator colours to assist in understanding the nature and breakdown of each task.

Board Report	
Planning & Design, Education & Outreach, Launch	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **GIBSONS LANDFILL LEASE AGREEMENT REPLACEMENT TENURE**

RECOMMENDATIONS

THAT the report titled Gibsons Landfill Lease Agreement Replacement Tenure be received;

AND THAT the lease agreement application for the Crown Land Replacement Tenure be endorsed;

AND FURTHER THAT the Delegated Authorities be authorized to execute the Management Plan and the Gibsons Closed Landfill Lease Agreement replacement tenure for a 30-year term for Blocks 3 and 4 of District Lot 1507.

BACKGROUND

On November 17, 2017, the Regional District received a letter from the Ministry of Forests, Land, Natural Resource Operations and Rural Development (FLNRO) regarding the upcoming lease agreement expiration for the closed Gibsons Landfill site. The letter states that the lease agreement between the SCRD and the Province for Blocks 3 and 4 of District Lot 1507 in Electoral Area F will expire on January 10, 2018 and asks the SCRD to apply for a replacement tenure by January 8, 2018.

The Province first issued a lease agreement for the site on October 1, 1978. The most recent agreement was issued on January 10, 2008 for a ten-year term.

A map showing the location of the Gibsons Landfill is included as Attachment A.

The purpose of this report is to obtain endorsement of the application and a Board Resolution approving of the purpose and term proposed for the lease agreement.

SCRD staff have received permission from FLNRO to submit the lease replacement application after the deadline in order to obtain a Board resolution at the January 11, 2018 Board meeting.

DISCUSSION

The current lease agreement term for the Gibsons Landfill was issued January 10, 2008 for a ten-year term, the maximum term available at that time.

The new lease agreement has the same conditions as its predecessor with the exception of an update to the term from 10 years to 30, recommended by FLNRO staff.

The agreement requires that the SCRD submit a site plan identifying the boundaries of the application area in relation to other legal boundaries and showing the location of all improvements. The application also requires a signed and dated Management Plan which describes the existing improvements shown on the site plan including size, layout and dimensions of the improvements, materials used and any scheduled development/maintenance.

The supporting documentation to be submitted as part of the Management Plan is the Gibsons Landfill Closure Plan, included as Attachment B.

Staff recommend that the Delegated Authorities be authorized to execute the Gibsons Landfill Lease Agreement replacement tenure for a 30-year term for District Lot 1507.

A Board Resolution is required to complete the lease agreement application.

Financial Implications

Other than the application fee of $210 (including GST), there are no additional financial implications related to the application.

Annual site monitoring costs are already included in the Financial Plan.

Timeline for next steps

The deadline for submitting the application package is January 8, 2018. SCRD staff contacted FLNRO on November 22, 2017 and confirmed with Ministry staff that the SCRD could submit the completed application after the submission deadline in order to receive a Board Resolution at the January 11, 2018 Board meeting.

STRATEGIC PLAN AND RELATED POLICIES

N/A

CONCLUSION

The Ministry of Forests, Land, Resource Operations and Rural Development has contacted the SCRD regarding a lease agreement replacement tenure for the use of District Lot 1507 for the closed Gibsons Landfill site.

Staff recommend that the Delegated Authorities be authorized to execute the Lease Agreement renewal for a 30-year term.

Reviewed by:			
Manager		Finance	
GM		Legislative	X-A.Legault
CAO	X-J.Loveys	Other	

Attachments

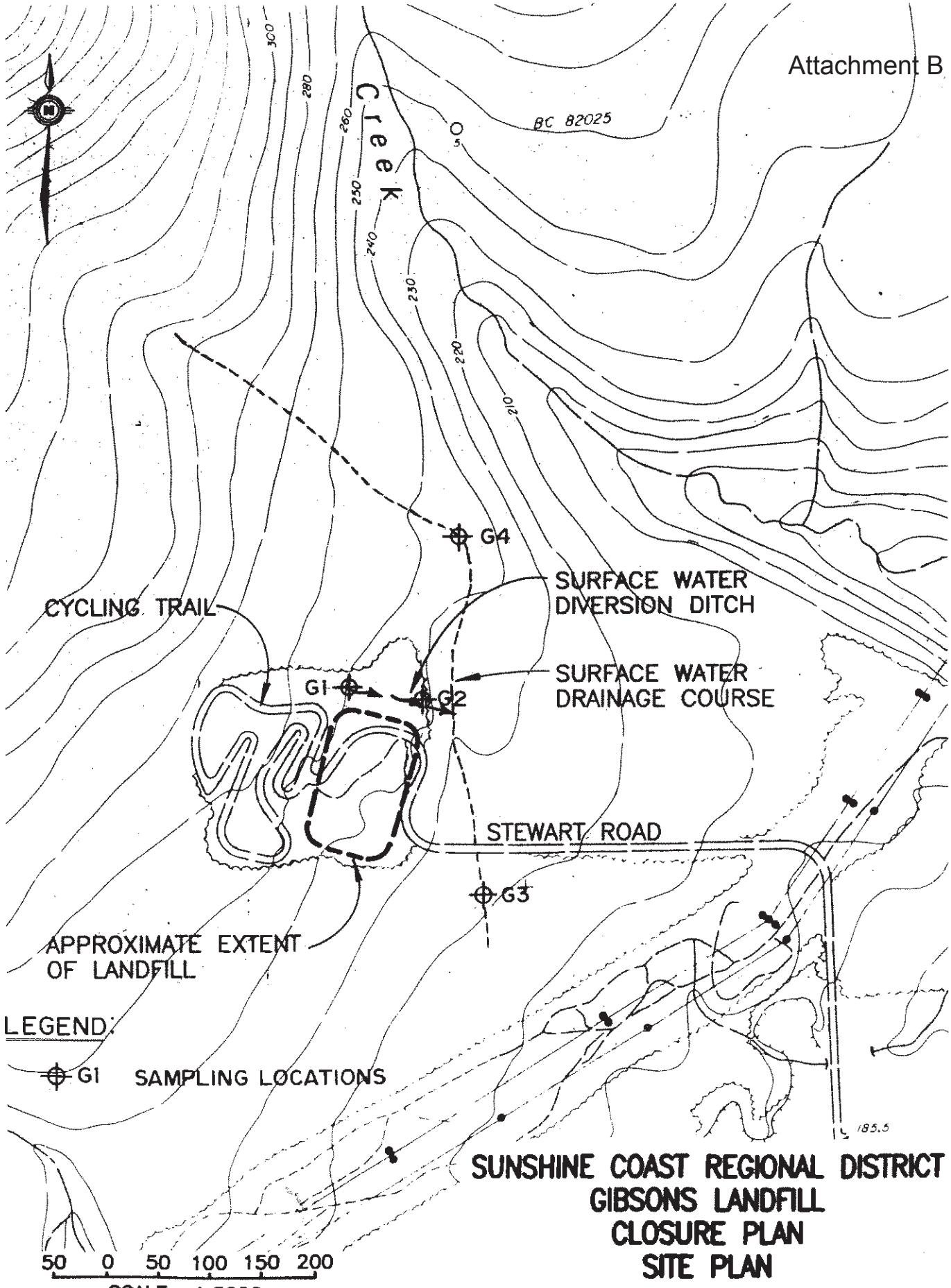
Attachment A – Closed Gibsons Landfill Site Location Map

Attachment B – Closed Gibsons Landfill Site Plan

Attachment A

Location Map

Attachment B



SUNSHINE COAST REGIONAL DISTRICT
GIBSONS LANDFILL
CLOSURE PLAN
SITE PLAN

FIGURE 2

DAYTON & KNIGHT LTD.
Consulting Engineers
DWG. No. 28.158

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – December 21, 2017

AUTHOR: Robyn Cooper, Manager, Solid Waste Services
Kara McDougall, Waste Reduction Coordinator

SUBJECT: **WASTE REDUCTION INITIATIVES PROGRAM (WRIP) 2017 RECIPIENTS**

RECOMMENDATION(S)

THAT the report titled Waste Reduction Initiatives Program (WRIP) 2017 Recipients be received.

BACKGROUND

The SCRD launched the Waste Reduction Initiatives Program (WRIP) in the fall of 2015.

The aim of the program is to provide seed funding to community groups, non-profit societies, charitable organizations and school groups to implement projects that contribute to waste reduction or diversion in the region. The WRIP is open to eligible organizations throughout the region.

The WRIP has been funded in 2015, 2016 and 2017 from the Eco-Fee Reserve in the amount of $5,000.

In 2015, five applications were received and the WRIP funded all five projects. In 2016, five applications were received and the WRIP provided funding for three projects.

The 2016 WRIP recipients have until December 31, 2017 to complete their projects. A report summarizing the outcomes of the 2016 projects will be presented to the Board in Q1 2018.

In 2017, a call for WRIP applications opened on Friday, August 25, 2017 and closed on October 20, 2017. Seven applications were received prior to the deadline and six projects received funding. These latest WRIP recipients will have until December 31, 2018 to complete their projects.

The purpose of this report is to inform the Committee with respect to the 2017 WRIP recipients.

DISCUSSION

In 2017, the WRIP continued to require that projects tangibly demonstrate and track the amount of waste reduced or diverted from landfill. A project that relied solely on qualitative data or that was indirectly related to waste reduction and diversion was given a lower score during the evaluation process.

In addition, funding preference was given to first-time applicants who met the funding criteria outlined in the WRIP Criteria and Guidelines. This is consistent with the prior years.

Seven applications were received prior to the deadline and the WRIP fully or partially funded six projects.

The total funding requested by the seven organizations totaled $8,722.50 out of the $5,000 available in 2017. The organizations have one year to implement their projects with a completion date by December 31, 2018.

A summary of projects awarded is included as Table 1.

Table 1 – 2017 WRIP Recipients

Organization	Project Name	Area Served	Funds Received	Full or Partial Funding
North Thormanby Community Association	North Thormanby community composting pilot project.	North Thormanby, Area B	$1,500.00	Full
Roberts Creek Community School	Roberts Creek Community School composting program for the school and nearby businesses.	Area D	$605.00	Partial
St. Bartholomew's Anglican Church	On-site composting program for the church and nearby organizations.	Town of Gibsons	$750.00	Full
Sunshine Coast Repair Cafe	Launch of repair cafes in Sechelt and Pender Harbour and enhancement of current repair cafes in Gibsons.	All	$840.00	Partial
West Sechelt Elementary	On-site school composting program.	District of Sechelt	$772.50	Full
West Howe Sound Community Association	Expansion of current community composting program to more residents and businesses.	Area F	$530.00	Partial
		Total	$4,997.50	

Financial Implications

The WRIP is funded annually from the Eco-Fee reserve in the amount of $5,000.

Timeline for next steps

The 2016 WRIP recipients have until December 31, 2017 to complete their projects. A staff report summarizing the 2016 project outcomes will be brought forward in Q1 2018.

The 2017 WRIP recipients have until December 31, 2018 to complete their projects.

The call for 2018 WRIP applications is anticipated to launch at the end of Q1 2018.

Communications Strategy

The WRIP call for applications was posted on the SCRD website, newspaper advertising and paid Facebook ads. The WRIP has a dedicated webpage on the SCRD website: http://www.scrd.ca/wrip

STRATEGIC PLAN AND RELATED POLICIES

The WRIP is aligned with the Strategic Priority of Embed Environmental Leadership.

The 2017 recipients and their projects will support five of the twenty-four Solid Waste Management Plan initiatives: residential waste reduction education, backyard composting, business waste diversion, yard waste composting and reuse.

CONCLUSION

The SCRD launched the Waste Reduction Initiatives Program in 2015 to assist community organizations in implementing projects that contribute to waste reduction or diversion in the region, supporting the Solid Waste Management Plan.

For the 2017 WRIP, seven applications were received prior to the deadline and six projects were funded. The project completion date is December 31, 2018.

This report is provided to Committee for information.

Reviewed by:			
Manager	X-R.Cooper	Finance	
GM		Legislative	
CAO	X-J.Loveys	Other	

SUNSHINE COAST REGIONAL DISTRICT
TRANSPORTATION ADVISORY COMMITTEE
October 19, 2017

RECOMMENDATIONS FROM THE TRANSPORTATION ADVISORY COMMITTEE MEETING HELD IN THE CEDAR ROOM OF THE SUNSHINE COAST REGIONAL DISTRICT AT 1975 FIELD ROAD, SECHELT, BC

PRESENT:	Director, Electoral Area E, Chair	Lorne Lewis
(Voting Members)	Director, Electoral Area A	Frank Mauro
	Director, Electoral Area B	Garry Nohr
	Director, Electoral Area D	Mark Lebbell
	Director, Electoral Area F	Ian Winn
	Director, Town of Gibsons	Jeremy Valeriote
	Director, District of Sechelt	Darren Inkster
	Trustee, School District No. 46	Dave Mewhort
	BC Ferries	Hanna Josephson
	Transportation Choices (TraC)	Alun Wooliams
ALSO PRESENT:	GM, Infrastructure Services/Regional Engineer	Michael Day
(Non-Voting)	Manager, Transit and Fleet	Gordon Dykstra
	Ministry of Transportation and Infrastructure	Don Legault
	Ministry of Transportation and Infrastructure	Colin Midgeley
	RCMP	Sgt. Mike Hacker
	Recorder	Diane Corbett
	Public	1
	Media	1

CALL TO ORDER 2:50 p.m.

AGENDA The agenda was adopted as amended:

- Defer item 5. ”Road Safety at Work” to next meeting

PETITIONS AND DELEGATIONS

Lesley Roberts regarding slow moving electric vehicles (golf carts) as a form of transportation in our localized communities

Ms. Lesley Roberts addressed the committee on the potential advantages of permitting slow moving electric vehicles (EV’s, e.g. golf carts) and other mobility devices as a form of transportation. For communities on the Sunshine Coast, this could enhance residents’ access to services and amenities and reduce social isolation.

Points raised in ensuing discussion included:

- *Experience of permitting golf carts on roads in Chase, BC and Qualicum Beach, which are pilot projects with a term attached.*
- *Public safety challenges presented by Highway 101 as well as lack of significant infrastructure for slow moving vehicles on the Sunshine Coast.*
- *Challenges and complexity of changing regulatory frameworks.*
- *Municipalities can pass bylaws to permit EV's, whereas rural areas (i.e. the SCRD) need provincial legislation changed to enable EV's on roads, including side roads.*
- *Motorized scooters on sidewalks must yield to pedestrians. Vehicles must be over 50cc and capable of minimum 50 km/h for travel on roadways.*
- *Further study would be required on the potential impacts of formally permitting electric vehicles on roadways.*
- *Regulations around transportation prioritize public safety, weighed against environmental considerations and access by the community. As the demographics change, regulations may change.*

The Chair thanked Ms. Roberts for her presentation.

MINUTES

Recommendation No. 1 *Transportation Advisory Committee Recommendations*

The Transportation Advisory Committee recommended that the recommendations of the July 20, 2017 Transportation Advisory Committee meeting be received, as corrected as follows:

- Page 1, third last entry on list of attendees should read *Sergeant* Mike Hacker, not C/O.

Recommendation No. 2 *Presentation Handout*

The Transportation Advisory Committee recommended receipt of the presentation handout on slow moving electric vehicles.

COMMUNICATIONS

Recommendation No. 3 *Communications*

The Transportation Advisory Committee recommended that the communication from Diana Mumford, Southern Sunshine Coast Ferry Advisory Committee regarding BC Ferries Update, be received.

Director Jeremy Valeriote reviewed the document in Ms. Mumford's absence, noting the responsiveness by BC Ferries to significant participation by residents. Also discussed were the repeated concerns of TransLink bus coordination and parking capacity.

ROUNDTABLE

- *Roadway maintenance contracts were discussed. Contract terms are posted on-line, and involve road classification which are based on projected traffic volume. Information on the maintenance requirements of specific roads can be requested from the Ministry of Transportation and Infrastructure (MoTI).*
- *Cycling lanes between Sunnycrest Mall and North Road will be completed this winter.*
- *MoTI has arranged to pave road depressions around Pender Harbour lakes, at Flume Road, and in the Gibsons area.*
- *Report on meetings at UBCM Convention with new Minister of Transportation and Infrastructure, Claire Trevena.*
- *MoTI to remind Capilano Highways to install signage for the blind intersection at Church, Central and Marine Drive in Grantham's Landing.*
- *Request that MoTI provide greater transparency regarding road classification and terms of the maintenance contract. Mr. Legault to bring information and an inventory of paving work to the next meeting.*
- *MoTI to follow-up on concerns about Redrooffs Road, especially around Coopers Green.*
- *Complaints about the road condition in the 1200 to 1300 block of Gower Point Road; MoTI to ask Capilano to install some riprap to stabilize the shoulder.*
- *Transit expansion is underway and running smoothly. Thanks to MoTI, the new Field Road stop is being paved. Buses will need to re-align with ferry schedule changes on January 2.*

NEXT MEETING To be announced

ADJOURNMENT 3:54 p.m.

November 28, 2017 File No: Tetrahedron Park/Chapman Lake

VIA EMAIL

Janette Loveys
Chief Administration Officer
Sunshine Coast Regional District
1975 Field Road
Sechelt, BC V0N 3A1

Dear Ms. Loveys:

RE: Tetrahedron Park – Sunshine Coast Regional District Community Water Supply

I am writing to provide an update on the status of the Tetrahedron Park file.

BC Parks is evaluating the options with respect to the water supply improvements proposed in Tetrahedron Park by the Sunshine Coast Regional District, including options for a public consultation process on the possible options. This is consistent with the Tetrahedron Provincial Park Management Plan (1997) which indicates that "[w]here regional water supply improvements are proposed, an impact assessment and comprehensive pubic consultation process will be developed."

At this point, we are seeking to confirm our direction and approach for the next steps in this process, including public and First Nations consultation. I anticipate I will have more information to share with you in the near future.

In the meantime, it would be helpful if you could provide a summary update on the Comprehensive Regional Water Plan, particularly initiatives related to source capacity including groundwater investigation and universal metering, so that we fully understand the Regional District's progress on this plan.

Sincerely,

Jennie Aikman
Regional Director

Ministry of Environment
BC Parks and Conservation Officer Service Division
South Coast Region

Mailing Address:
1610 Mount Seymour Road
North Vancouver BC V7G 2R9

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