INFRASTRUCTURE SERVICES COMMITTEE

Thursday, November 19, 2020
SCRD Boardroom, 1975 Field Road, Sechelt, B.C.

AGENDA

CALL TO ORDER 9:30 a.m.

AGENDA

1. Adoption of Agenda

PRESENTATIONS AND DELEGATIONS

REPORTS

2.	Woodcreek Park Wastewater Treatment Plant Replacement Update General Manager, Infrastructure Services / Manager, Capital Projects **(Voting – All)**	Annex A pp 1 - 80
3.	Contract for Church Road Well Field Project – Update General Manager, Infrastructure Services / Manager, Capital Projects **Regional Water (Voting – A, B, D, E, F and Sechelt)**	Annex B pp 81 - 82
4.	Drought Response Plan 2020 Summary Water Sustainability Coordinator **Regional Water (Voting – A, B, D, E, F and Sechelt)**	Annex C pp 83 - 90
5.	Preliminary Participation Summary - Green Bin Program Manager, Solid Waste Services **Regional Solid Waste (Voting – All)**	Annex D pp 91 - 113
6.	Diversion Materials Tipping Fee Review Manager, Solid Waste Services **Regional Solid Waste (Voting – All)**	Annex E pp 114-119
7.	South Coast Green Waste Drop-Off Depot Operations – Update Manager, Solid Waste Services **Regional Solid Waste (Voting – All)**	Annex F pp 120-122
8.	Request for Proposals 2035009 Contract Award Green Waste Container and Hauling Service Manager, Solid Waste Services **Regional Solid Waste (Voting – All)**	Annex G pp 123-125

9. Disposal for Boats and Recreation Vehicles Pilot Project - Update — Annex H
Manager, Solid Waste Services — pp 126-129
Regional Solid Waste (Voting – All)

10. Terms of Reference Sunshine Coast Transit Future Action Plan — Annex I
Manager, Transit and Fleet — pp 130-139
(Voting –B, D, E, F, Sechelt, Gibsons, SIGD)

11. Transportation Advisory Committee Meeting Minutes of October 15, 2020 — Annex J pp 140-144
(Voting – All)

12. Solid Waste Management Plan Monitoring Advisory Committee Meeting Minutes of October 20, 2020 — Annex K pp 145-147
Regional Solid Waste (Voting – All)

13. Water Supply Advisory Committee Meeting Minutes of November 2, 2020 — Annex L pp 148-150
Regional Water (Voting – A, B, D, E, F and Sechelt)

COMMUNICATIONS

14. Patrick Weiler, MP for West Vancouver – Sunshine Coast – Sea to Sky Country dated November 9, 2020 — Annex M pp 151-152
Regarding Universal Broadband Fund

NEW BUSINESS

IN CAMERA

ADJOURNMENT

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Stephen Misiurak, Manager, Capital Projects

SUBJECT: **WOODCREEK PARK WASTEWATER TREATMENT PLANT REPLACEMENT UPDATE**

RECOMMENDATION(S)

THAT the report titled Woodcreek Park Wastewater Treatment Plant Replacement Update be received.

BACKGROUND

Originally constructed in 1999, the Woodcreek Park Wastewater Treatment Plant (WWTP) provides treatment of liquid waste water to 73 properties within the Woodcreek Park subdivision, located in Electoral Area E.

The current treatment system is not functioning to original specifications and has numerous performance deficiencies related to both treatment and collection. The SCRD has received recent advisories from the Ministry of Environment and Climate Change Strategy (MOE) indicating compliance issues with our current effluent permit due to effluent quality and flow related results at the facility.

In 2020 the SCRD retained MSR Solutions Inc. (MSR) engineering consultants to assist with analyzing the current treatment system and to recommend cost-effective solutions to address the system deficiencies. MSR will also provide detailed design and a set of bid-ready tender construction documents. MSR submitted a final report to the SCRD in mid-October 2020 that provided technical analyses and a proposed budget for the replacement and remediation of the Woodcreek Park WWTP.

On October 22, 2020 the SCRD submitted an application for grant funding under the Investing in Canada Infrastructure Program – Rural and Northern Communities (ICIP-RNC) towards the capital construction of the replacement and remediation works for the Woodcreek Park WWTP.

The following resolution was adopted by the SCRD Board at its meeting on October 22, 2020:

350/20 **Recommendation No. 3** *Investing in Canada Infrastructure Program – Rural and Northern Communities 2020 Grant Application - Woodcreek Park Wastewater Treatment Plant System Upgrade and Ports Capital Renewal*

THAT the report titled Investing in Canada Infrastructure Program – Rural and Northern Communities 2020 Grant Application - Woodcreek Park Wastewater Treatment Plant System Upgrade and Ports Capital Renewal be received;

AND THAT staff submit applications for grant funding through the Investing in Canada Infrastructure Program – Rural and Northern Communities for:

a) the Woodcreek Park Wastewater Treatment Plant System Upgrade; and

b) the Ports Capital Renewal Project;

AND THAT the Board supports the Woodcreek Park Wastewater Treatment Plant System Upgrade project and commits to its share ($75,000) of the project, as well as cost overruns;

AND FURTHER THAT the Board supports the Ports Capital Renewal Project and commits to its share ($20,000) of the project as well as cost overruns.

The purpose of this report is to provide the Board with a summary of MSR's technical review of the Woodcreek Park WWTP and discuss the timelines and options for next steps.

DISCUSSION

Options and Analysis

The Woodcreek Park community is reliant on a functioning wastewater management facility in order to properly treat and dispose of the effluent produced in the neighborhood. The existing Woodcreek Park WWTP has been functioning poorly and the SCRD retained MSR to conduct a condition review and technical analysis of the existing wastewater treatment system. This study involved a collaborative approach between SCRD technical and engineering staff and the consultant team at MSR and resulted in the following report deliverables:

- Background and System Component Review
- System Performance Review
- Condition Assessment
    - Site inspection and finding(s);
    - Test pits for filter media condition inspection;
    - Desktop review of infrastructure age and/or useful life;
    - Review of 2018 Collection System CCTV assessment.
- Effluent Permit Considerations
- Design Considerations of Replacement/Remediation Options
- Treatment System Solutions Review
- Recommendations and Capital Cost and Life Cycle Cost Estimates
- Project Schedule and Timeline

MSR's full report titled, "Sunshine Coast Regional District Woodcreek Park Subdivision Sand Filter Replacement Options" is included as Attachment A to this report.

<u>Summary of Existing Issues/Condition</u>

Below is a brief summary of the notable issues identified in MSR's review of the Woodcreek Park WWTP treatment system:

- The secondary sand filter effluent treatment system is in failing condition and beyond its useful life; requires replacement due to accumulation of excess organic loading, saturation and pooling;

- Issues regarding excessive system flow rates and effluent quality issues have resulted in non-compliance infractions and warnings from MOE; numerous treatment and collection system repairs required to meet Permit requirements;
- Inadequate headworks for the facility is causing imbalanced flow between treatment tanks;
- The aeration system in the recirculating tank is not operating and is likely contributing to effluent quality issues;
- The recirculating filter is near the end of its life and has performance issues; alternatives are required to ensure secondary effluent quality can be maintained prior to disposal field discharge;
- The collection system has several locations of pipe joint separation, offset and/or breaks as well as service connection failures; a contributing factor to system infiltration.

Evaluation of Alternatives

As part of their review, MSR provided a thorough list of possible replacement and remediation options to address the various deficiencies identified above. In their review of options to replace the secondary sand filter treatment system, they considered media-based recirculating filters and prefabricated treatment units. Consideration of the existing site and feasible location options were incorporated in their evaluation of alternatives. A comparison of capital costs was provided for the alternatives considered and is included in summary form in Table 1 below.

Table 1: Estimated Capital Costs of Potential Treatment Options

Component	Gravel Filter	Media Filter	Advantex	Coco Filter
Construction Estimate	$218,750	$208,250	$272,250	$282,250
Engineering	$50,000	$50,000	$50,000	$50,000
MoE Registration	$10,000	$25,000	$25,000	$25,000
Taxes and Contingency	$98,000	$99,000	$122,000	$125,000
Estimated Construction Cost Total	**$376,750**	**$382,250**	**$469,250**	**$482,250**

Recommendations

The review of alternative options was a collaborative process between MSR and SCRD staff. The review process considered the estimated costs of construction as well as other important factors such as system redundancy, life cycle costs, operation and maintenance efficiencies, permit considerations and overall treatment system quality and reliability.

Based on an examination of the options available and the considerations of factors identified above, the following works were recommended to provide for the improvements to the treatment system:

- Installation of a new recirculating filter based on the Advantex cloth media system;
- Remediation of the existing gravel filter system to ensure compliance with Permit requirements and to remain in service as a backup solution;
- Replacement of existing headworks to remove the current screen area, and to improve flow splitting between the tanks;
- Replacement and connection of an aeration system to the recirculation tank helixors to enhance mixing and treatment efficiencies;
- Improvements to the inlet piping to minimize solids plugging and to improve flow distribution.

Although out of scope of MSR's detailed assessment, staff recommend that the deficiencies within the collection system be addressed as part of this project. Infiltration and inflow (I&I) are contributing factors to the excessive flow rates and treatment issues currently being experienced. Repairing severed conveyance piping and repairing leaking manholes and service laterals will have a beneficial impact on the current and future system performance and is a relatively low-cost addition to the overall scope of work.

Financial Implications

The recommendations identified above were detailed and provided along with a comprehensive project budget as part of the recent ICIP-RNC grant application. The project budget was included as part of the October 15, 2020 ISC report to the Committee and is detailed in Table 2, below. The project budget estimate identified in Table 2 incorporates the combined costs of remediating the existing sand filter, installation of the Advantex treatment system, remediation of the primary treatment system and associated infrastructure as well as other tangible expenditures anticipated to address the recommendations listed above. The estimated project costs identified in Table 2 were slightly amended from MSR's values to include collection system repairs, additional engineering related expenditures, internal salaries and wages and a modified contingency allowance.

Table 2: Woodcreek Park WWTP System Upgrade – Project Budget Estimate

Woodcreek Park WWTP Project Budget Estimate	
Treatment System Replacement and Remediation	$436,200
Collection System Repairs	$50,000
Engineering and Other	$85,000
Contingency @ 30%	$172,800
Taxes	$25,000
Subtotal	**$769,000**
Other Project Expenditures	
Internal Salaries, Benefits, Misc.	$75,000
Total	**$844,000**

This budget is inclusive of all related site works, material supply, primary construction and additional engineering and/or permitting associated with the replacement and remediation of treatment and collection systems included in the scope of work for this final phase. The budget estimate includes a 30% contingency to allow for unanticipated cost overruns and/or minor scope changes.

As stated earlier, the SCRD applied for grant funding under the ICIP-RNC program and if successful would receive 100% of the eligible costs for this project. The Board has previously committed to funding the ineligible project costs (i.e. $75,000) from uncommitted Woodcreek Park cash reserves. The uncommitted reserve balance as of September 30, 2020 is $162,049 and is inadequate to solely fund this project.

As part of 2021 Budget discussions, staff will be bring forward a Budget Proposal for this project to fund this project via long term debt, obtained through an Alternative Approval Process (AAP), initiated in the event that grant funding is not obtained.

Given the relatively small number of parcels and 'users' within the Woodcreek Park WWTP service area, funding this project with a long term-debt issuance would result in a considerable requirement to increase fees and charges. Per the October 15th Corporate and Administrative Services Committee staff report related to the Grant application, if total project costs were $844,000, the estimated increase in annual fees per parcel would be approximately $643/parcel. Upon further review of the project scope, project costs could be up to $835/parcel based on long-term borrowing at 3% for 20 years. In the event the grant funding is unsuccessful, staff will therefore review the scope of work to determine if a less capital-intensive solution could address the immediate system performance concerns and defer other improvements to a later date.

Timeline for next steps or estimated completion date

It is anticipated that funding announcements for approved ICIP-RNC projects will be made in the late spring or summer of 2021. According to the ICIP-RNC program guide, the SCRD is not permitted to commence with construction or construction procurement efforts (i.e. tendering or tender award) until after the date of program approval or else the project will be deemed ineligible.

Staff will continue to work with MSR during the grant application review period to advance detailed design coordination and preparation, preliminary permitting efforts and the preparation of bid-ready specifications and tender documents.

A preliminary project schedule has been included as part of this report. As per the schedule, it is anticipated that construction would begin in September 2021 with construction completion and commissioning occurring in January 2022 (Attachment B).

If the grant would be unsuccessful a report on the timing of an AAP would be brought forward at that time.

STRATEGIC PLAN AND RELATED POLICIES

This project supports the SCRD Strategic Plan's Strategic Focus Area 2: Asset Stewardship as well as the Corporate Financial Sustainability Policy Section 4.3.1 by making an effort to access alternative funding sources.

CONCLUSION

The Woodcreek Park WWTP has deficiencies to the primary and secondary treatment system as well as problems related to aeration, inflow/infiltration and a collection system in need of repairs. These issues prompted the SCRD to commission a condition assessment and preliminary engineering review of the system by MSR engineering consultants. The findings and recommendations of this review identify several infrastructure replacement and repairs required in order to ensure the ongoing functionality of this wastewater system and regulatory compliance.

Staff have applied for Provincial/Federal grant funding support, under the ICIP-RNC program, for this project, and anticipate funding announcements sometime in mid-2021. A 2021 Budget Proposal for this project will be brought forward as part of 2021 Budget discussions with recommendations to fund this project with long term debt (AAP) if the SCRD is unsuccessful in its grant application. Staff will continue to work with its engineering consultants to advance the design and planning stages of this project while the SCRD awaits the determination of its grant application.

ATTACHMENTS

A – MSR Solutions Inc. report dated October 13, 2020
B – MSR Solutions Inc. – Project Schedule

Reviewed by:			
Manager	X – S. Walkey	CFO/Finance	X-T.Perreault
GM	X – R. Rosenboom	Legislative	
CAO	X – D. McKinley	Other	X – S. Misiurak

Sunshine Coast Regional District
Woodcreek Park Subdivision
Sand Filter Replacement Options

Date: October 13, 2020

Prepared by:

MSR Solutions Inc.
125-662 Goldstream Avenue
Victoria, BC V9B 0N8
P: 1+(250)-479-5164
F: 1+(888)-277-2816

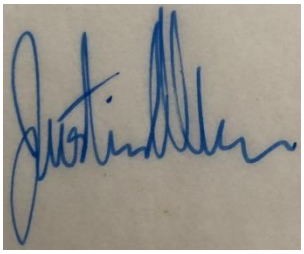
Submitted to:

Sunshine Coast Regional District
1975 Field Road
Sechelt, BC, V0N3A1
P: 1+(604)-885-6800
F: 1+(604)-885-7909

Prepared for:

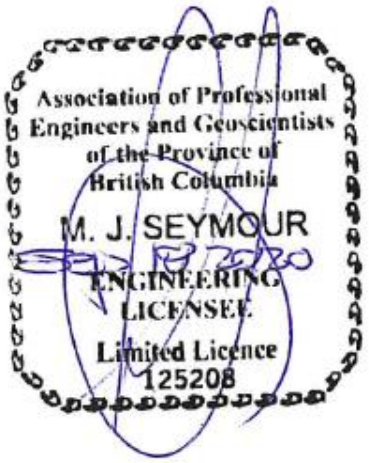
Sunshine Coast Regional District
1975 Field Road
Sechelt, BC, V0N3A1
P: 1+(604)-885-6800
F: 1+(604)-885-7909

Prepared by:



Justin Allen,
Engineering Co-op Student
Email: justin@msrsolutions.ca

Reviewed by:



Mike Seymour, AScT, Eng.L
Manager, Water and Wastewater Systems
Email: mike@msrsolutions.ca

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

The Sunshine Coast Regional District (SCRD) has retained MSR Solutions Inc. to design a system to replace the existing recirculating sand filter (RSF) due to apparent ineffectiveness of current performance. The system is located at the Woodcreek Park Wastewater Treatment Plant (WWTP) in the Woodcreek Park residential neighborhood of Electoral Area E, Sunshine Coast Regional District. The system serves 73 homes under Permit # PE-04183 issued under the Municipal Wastewater Regulation (MWR) by the Ministry of Environment (MoE). Under the permit, maximum daily discharge shall not exceed 75 m^3/day, TSS shall not exceed 45 mg/L, and BOD_5 shall not exceed 45 mg/L.

Figure 1 - WWTP and Disposal Aerial View

2.0 Background

Originally constructed in 1999 the existing WWTP consists of a coarse bar screen, septic tanks, a recirculation tank, a pumping tank, a recirculating sand filter, and effluent disposal fields. Some minor modifications have been made to the system over the last 20 years.

The bar screen was removed at some point due to the manual cleaning requirements, which could not be provided regularly. The split of flows to the septic tanks is uneven, resulting in Septic Tank #1 receiving most of the flow. Flow from the first chamber of the septic tanks to the second is by a tee in the pipe, and short circuiting can cause disproportionate solids loading to the second chamber. Aeration in the secondary chamber has not operated in several years with the blowers now disconnected.

The recirculating filter does not appear to be functioning to specifications due to a combination of short circuiting and plugging of the media. The ground water table around the disposal field to sand filter interface can rise to near the surface in wet weather conditions, raising concerns of inflow & infiltration (I&I). The various conditions have resulted in the engineering assessment. See section 6.0 for a detailed description of the current system and Appendix D for record drawings.

3.0 Ministry of Environment Permit PE-04183

The Woodcreek Wastewater Facility operates under permit PE-04183 which requires that maximum daily effluent discharge shall not exceed 75 m^3/day, TSS shall not exceed 45 mg/L, and BOD_5 shall not exceed 45 mg/L. Failure to comply with the permit was first addressed by the Ministry of Environment (MoE), Environmental Protection Division staff on September 12, 2017 following an inspection that took place on July 27, 2017. The report indicated the following issues:

- BOD_5 of 93 mg/L on July 4, 2017
- Failure to notify the MoE of non-compliance within 24 hours
- Failure to provide a written non-compliance report within 30 days of non-compliance

A second non-compliance advisory was reported on January 22, 2018 following an inspection which took place on January 08, 2018. The report indicated the following issues:

- Discharge of 85.2 m^3/day on December 29, 2017
- Discharge of 106.45 m^3/day on January 02, 2018

A warning letter was identified in the MoE inspection report dated March 02, 2020. The inspection report was based on the results of the MoE inspection conducted from July 01, 2018 to December 31, 2019 which indicated the following issues:

- Discharge ranging from 80.2 m^3/day to 109.3 m^3/day on five occasions
- Effluent TSS ranging from 52.8 mg/L to 191 mg/L on four occasions
- Failure to notify the MoE of non-compliance within 24 hours
- Failure to provide a written non-compliance report within 30 days of non-compliance

Failure to comply with the terms and conditions set out in an authorization permit is an offence under the Environmental Management Act (EMA). Non-compliance will incur costs to both the SCRD and residents of the Woodcreek Park subdivision and should be remedied as quickly as possible. As a result of non-compliance addressed by the MoE, the SCRD sought solutions resulting in MSRS being retained to analyse the system and recommend cost-effective solutions to bring effluent back in line with Permit requirements. The SCRD has requested that MSRS generate multiple treatment options to correct, or replace the failing sand filter and provide a cost-estimate that details both upfront capital costs and annual maintenance costs. Once the most cost-effective solution has been determined and agreed upon by the SCRD, MSRS will provide a detailed cost estimate and a set of bid-ready tender documents.

4.0 System Performance Review

4.1 General

A review of the system's treatment performance over its lifetime will provide insight as to when the system first failed and the potential causes for failure. A review of the historical precipitation as it relates to recorded flow discharge rates will help to determine whether I&I is a significant contributor to flow exceedances. Furthermore, an analysis of the changes in effluent quality over time will be useful for determining potential causes of failure. This will be beneficial when considering the expected lifetime and maintenance requirements of a new system.

4.2 Treatment System Flow Information

The service area for Woodcreek Park wastewater treatment plant consists of a gravity collection system serving 73 homes. Flow into the system occurs from the homes as well as any inflow and infiltration (I&I) that reaches the collection system.

Measurement of flow is based on records from measurement taken by the SCRD at the facilities. A summary of effluent flow values from 2017-2019 can be seen in Appendix A - Table 3, Table 4, and Table 5, respectively. Earlier flow data is inconsistent yet indicates similar trends.

As seen in Table 3, Table 4, and Table 5, most of the daily effluent flow produced by the WWTP in 2017, 2018, and 2019 was within the permit regulations of 75 m^3/day. Data presented in Appendix B – Daily

Flow and Inflow Estimation suggests that inflow to the sand filter is not the sole contributor of excess flow, however; infiltration may still be a factor as the historical flow data shows a correlation between rain events and days of excess flow.

Historical flow data summarizing treated effluent flow and rainfall precipitation (PPT) for 2017, 2018, and 2019, can be seen in Figure 1, Figure 2, and Figure 3, respectively.

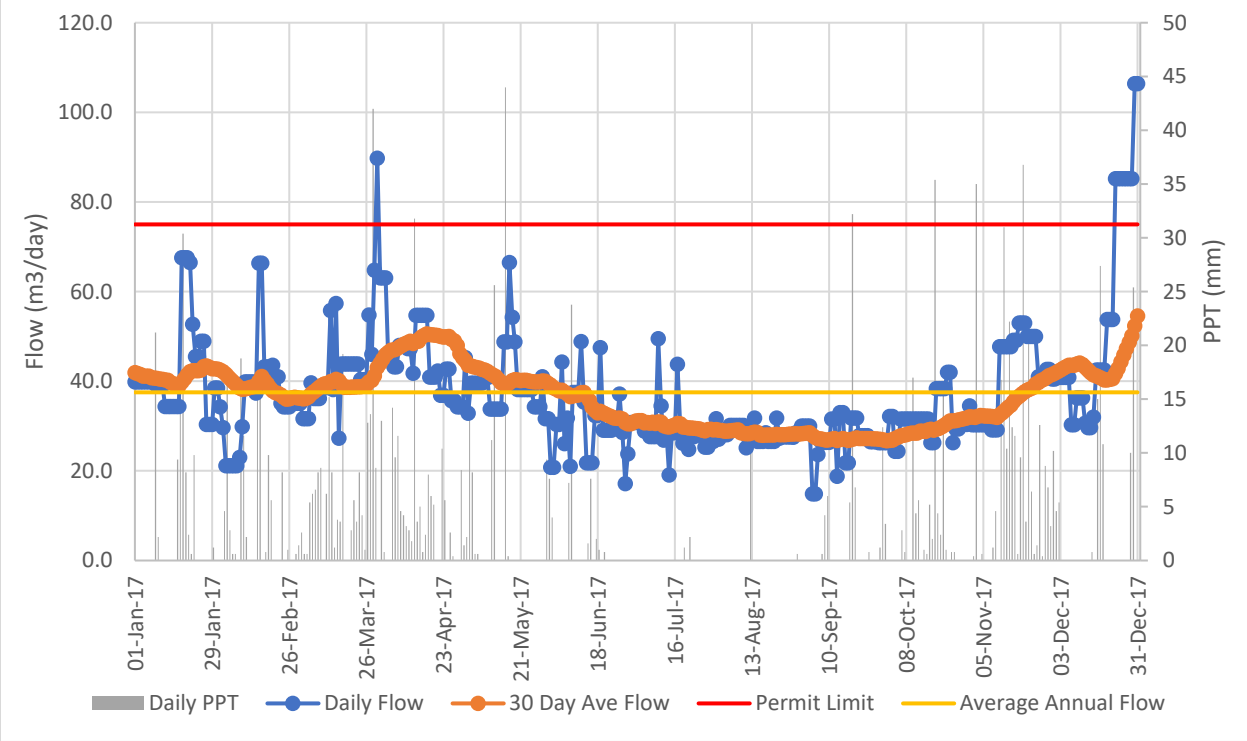


Figure 2 – Woodcreek Park WWTP 2017 Effluent Flow and Daily Rainfall

As seen in Figure 1, the maximum 30-day average flow in 2017 was approximately 55 m^3/day. Many of the highest daily flow rates are observed on days with rain events and days following rain events, suggesting that infiltration may be a contributing factor. Furthermore, the days with the lowest flow rates were observed when there were no rain events. The average annual flow in 2017 was approximately 38 m^3/day. A similar pattern occurred in 2018 and can be seen in Figure 2.

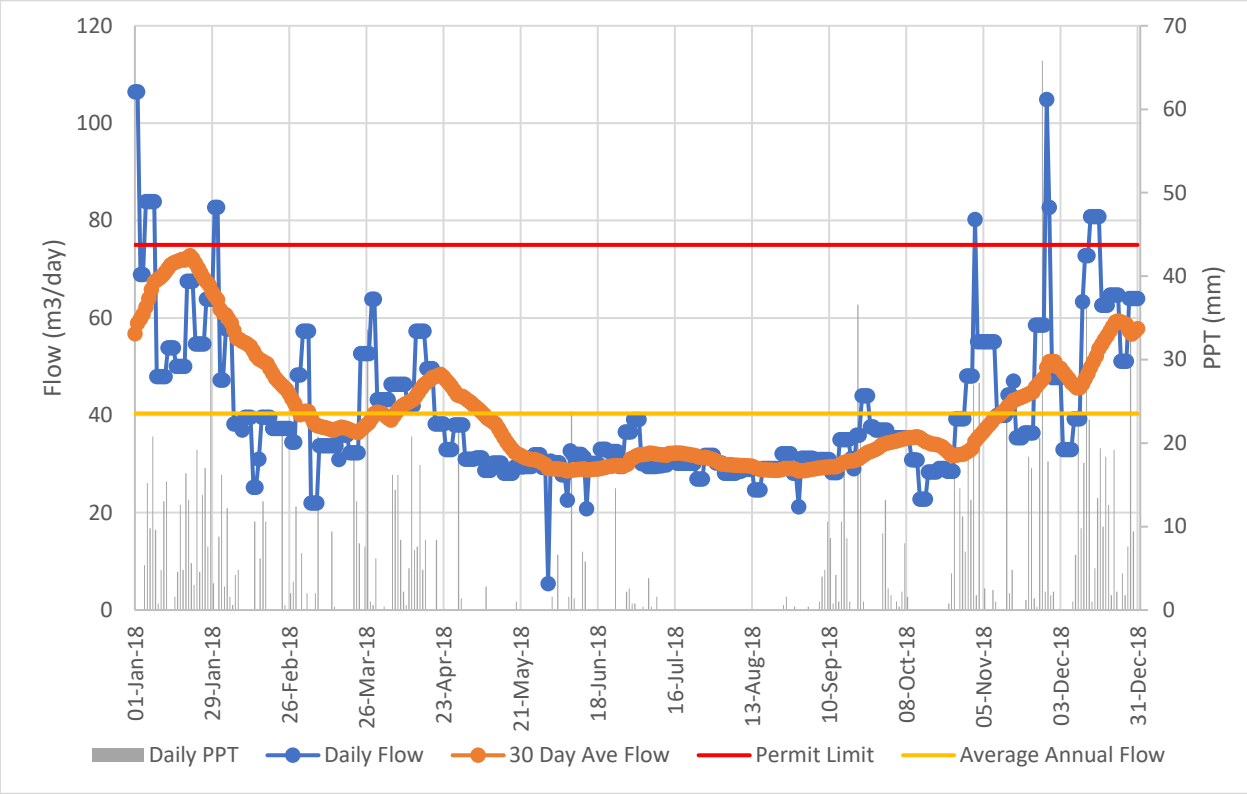


Figure 3 – Woodcreek Park WWTP 2018 Effluent Flow and Daily Rainfall

As seen in Figure 2, the maximum 30-day average flow in 2018 was 73 m^3/day due to high flow rates through December 2017 and into January 2018.Similar to 2017, many of the highest daily flow rates seen over this time period are observed on days with rain events and days following rain events, while many of the lower daily flow rates were seen on days without rain events. This trend continued in 2019 and can be seen in Figure 3.

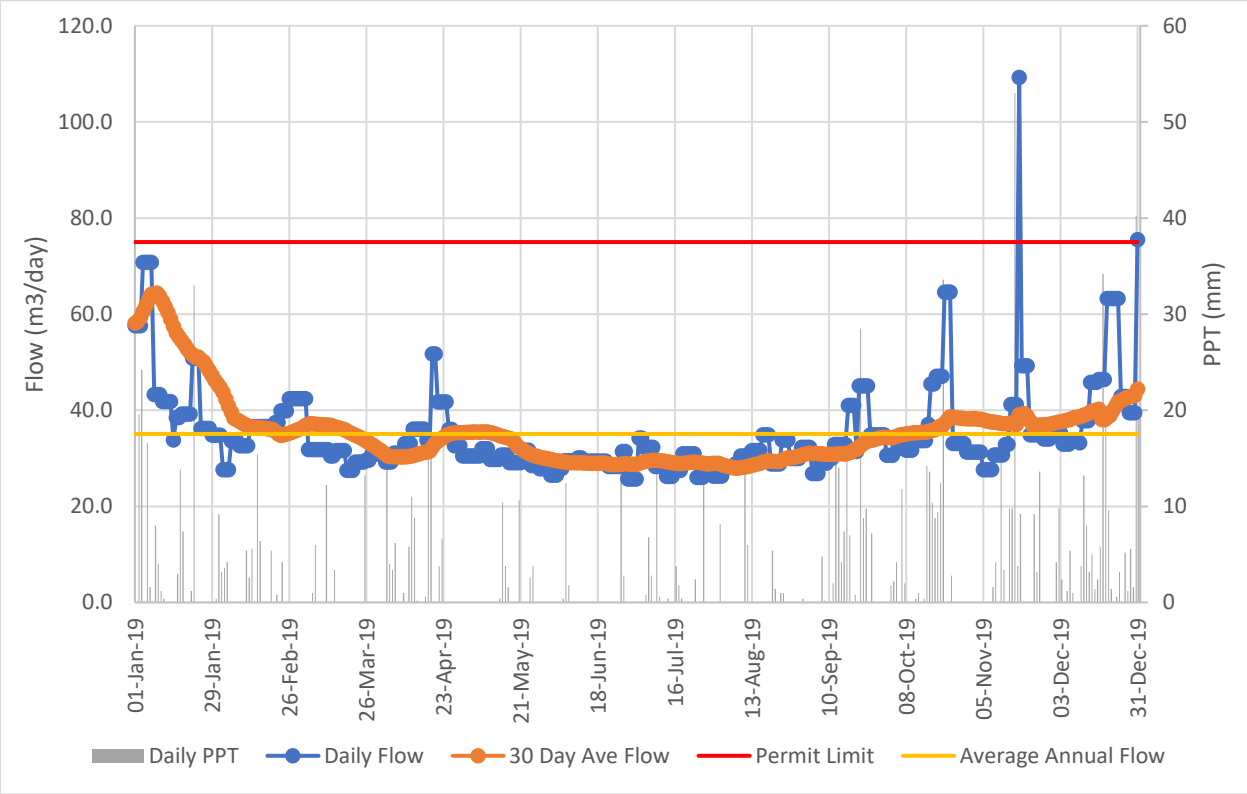


Figure 4 – Woodcreek Park WWTP 2019 Effluent Flow and Daily Rainfall

As seen in Figure 3, maximum 30-day average flow in 2019 was approximately 64 m^3/day, while average annual flow for 2019 was approximately 35 m^3/day. Similar to 2017 and 2018, many of the highest daily flow rates are observed on days with rain events and days following rain events, and many of lowest daily flow rates occurred on days without rain events, suggesting that infiltration may be a contributing factor.

4.3 Effluent Quality

Operations and maintenance are provided by SCRD staff who reported that the sand filter was taken out of service and bypassed between 2016 and May 30, 2018. The filter was briefly taken out of service and by-passed again between June 1, 2018 and June 6, 2018. Poor effluent quality was first noted by the MoE to be periodically compromised in 2017. Effluent quality continued to fluctuate leading the MoE to issue non-compliance advisories in 2018 and 2020. An analysis of effluent quality from 2017-2019 is

important for understanding recent treatment performance of the current system. Performance reports from earlier years are less pertinent but will provide insight into potential causes of failure and may reveal patterns in performance changes that have occurred over a longer timescale.

As seen in Appendix A, Table 6, BOD exceeded 45 mg/L for all of 2017 and much of 2018, although limited data was available for 2018. There were no reports of BOD greater than 45 mg/L in 2019. The reported TSS values were less than 45 mg/L for all of 2017 except June, and September through December. TSS in 2018 was greater than 45 mg/L in January, February, and September. Notes from the SCRD log suggest that a poorly functioning sand filter was to blame for the poor effluent quality.

According to notes from the SCRD, a plant pump-out of both septic tanks and the recirculation tank was completed on May 30th, 2018. Further cleaning and maintenance procedures were undertaken from May 31st to June 6th. Although BOD data is limited for 2018, the available data suggests that the cleaning and maintenance contributed to improved performance of the WWTP. BOD and TSS values in 2019 were all below 45 mg/L except in January, March, and April where TSS was reported as 52.9 mg/L, 61 mg/L, and 53.5 mg/L, respectively. Reports from the SCRD logs indicate that a clogged filter was the cause. After the filter was cleaned, BOD and TSS values were below 45 mg/L for the rest of the year.

A summary of effluent quality from 2005-2019 can be seen in Appendix A, Table 6. Issues with effluent quality began in 2012 and became a consistent problem in 2014. From 2014-2016 the reported BOD value was greater than 45 mg/L for every month, with some months reporting values over 4 times the permit allowance. Maintenance reports for this time were not available.

A summary of the number of months where effluent exceeded permit allowances in terms of flow, BOD, and TSS, can be seen in Figure 4.

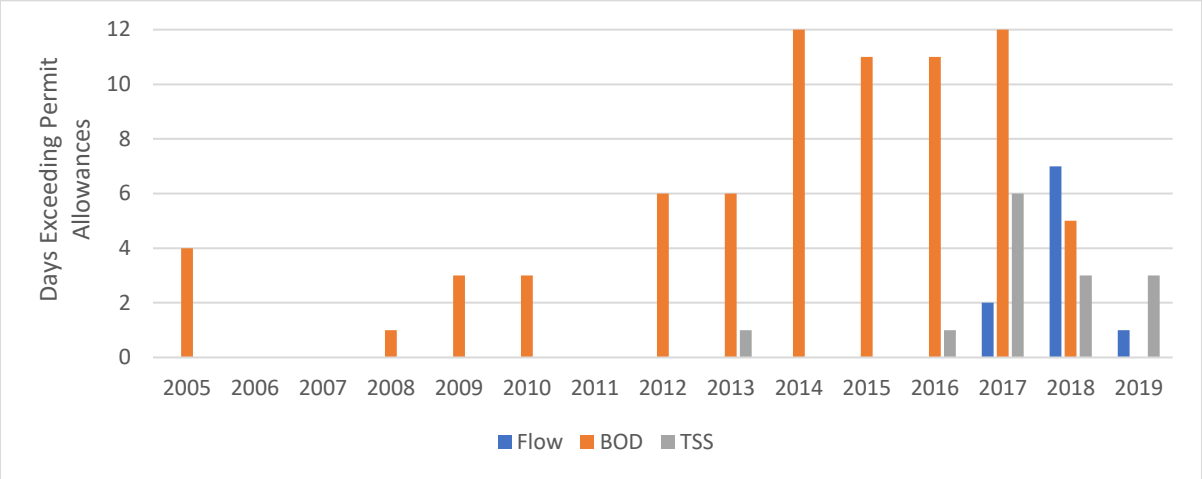


Figure 5 – Days Exceeding Flow, BOD, and TSS Permit Allowances, 2005-2019

As seen in Figure 4, issues with effluent quality were consistently an issue beginning in 2014 and continued until a plant pump-out was conducted in 2018. Flow data was unavailable from 2005-2016, however we suspect exceedances in the 1% range.

4.4 Additional Factors to the Treatment and Disposal Operations

Based on log reports, the installation of gas services over the lifetime of the subdivision purportedly resulted in several directional drilling connections piercing the gravity sewer pipe (material not known). This was not noticed until abnormal flows were seen in late 2017 and early 2018. An infiltration study was started in early 2018 and later resumed once the wet weather returned.

The collection system was assessed on December 26, 2018 using closed circuit television camera methods which revealed several locations of pipe joint separation, pipe joint offset, breaks, and service connection failures in the system. The SCRD has reported that at least some of the damage has been repaired. It is possible that the damage observed in the collection system contributed to high flows which were observed and reported.

5.0 June 18th, 2020 Site Inspection

On June 18th, 2020, MSR Solutions staff inspected the existing WWTP and RSF along with SCRD staff, to better understand the system and to investigate some of the potential concerns with regards to operations and performance of the system. Discussions with the facility operator revealed that sewage flows via gravity and passes through a coarse screen area (bar screen since removed) before splitting into two septic tanks that operate in parallel. The operator explained that flow to each of the septic tanks is unequal, resulting in Septic Tank #1 receiving most of the flow. Generally, the cause of this issue can be attributed to solids attaching to sharp edges and pipe inlets acting as temporary flow dams until surge flows resuspend the solids. This is a factor in increased maintenance requirements.

An inspection of the various components noted aging equipment, non-functioning blowers, and concerns with solids accumulations in the second chamber and equalization chamber. A visual inspection of the existing sand filter, as seen in Figure 5 and Figure 6, showed that much of the surface of the sand filter is covered in vegetation.

Figure 6 – Surface of Zone 1 of the RSF

Figure 7 – Surface of Zone 2 of the RSF

In general, it is recommended that the surface of an RSF is kept free of vegetation to facilitate proper air circulation and re-aeration of the field, as well as to minimize additional organic loading.

As shown in Figure 7 and Figure 8 below, test pits were dug into the surface of the sand filter to inspect the filter media. The media was found to be saturated and showed evidence of uneven distribution and pooling. As shown in Figure 8, water mounding in Zone 2 was higher than in Zone 1, with heavy particulate build-up occurring around the roots of the vegetation. In general, the root zone was extending below the distribution laterals. The plugging interface where the solids were accumulating appeared thickest at 0.3 to 0.45 m below the top of the filter.

The clogged media has impeded the rate of drainage through the system which requires a slight driving head of the mounded water to effectively circulate the effluent.

Figure 8 – Test Pit #1, located in Zone 1 of the RSF

During the inspection, it was possible to hear when the field was receiving a dose. After listening to several doses, it became evident that at least one of the Orenco distributing valve assemblies in the distribution boxes was broken, resulting in continuous discharge to only one of the cells instead of alternating doses between cells.

Figure 9 – Test Pit #2, located in Zone 2 of the RSF

Figure 10 – Distribution Box to Zone 1 of the RSF

The purpose of the distribution box is to alternate flow between sets of laterals in the respective zones. The damaged flow valve has resulted in portions of the zone receiving constant flow which disturbs the cycle of flooding and draining. Resting time between doses is important to allow for aeration and to allow effluent to freely pass through void spaces. The aerobic bacteria within the sand filter need oxygen to metabolize waste – without it they essentially suffocate, resulting in solids accumulation throughout the void spaces. This results in performance issues for multiple reasons. With void spaces now filled with waste, the bacteria have less space to live and no access to oxygen. The population of aerobic bacteria within the sand filter will die off and may be replaced with anaerobic bacteria, resulting in foul odours. This illustrates the important balance that must be achieved through a well-regulated dosing cycle. Enough wastewater must be delivered to the sand filter to feed the aerobic bacteria and maintain a large population, but not to the point that clogging occurs.

In addition to the age of the existing sand filter, that is the accumulation of organic loading over the many years of operation, the combination of the issues seen during the site inspection verify the system is failing, and no longer able to maintain the design loading rate without the potential of ponding of partially treated effluent on the surface.

6.0 Treatment System and Disposal as Installed

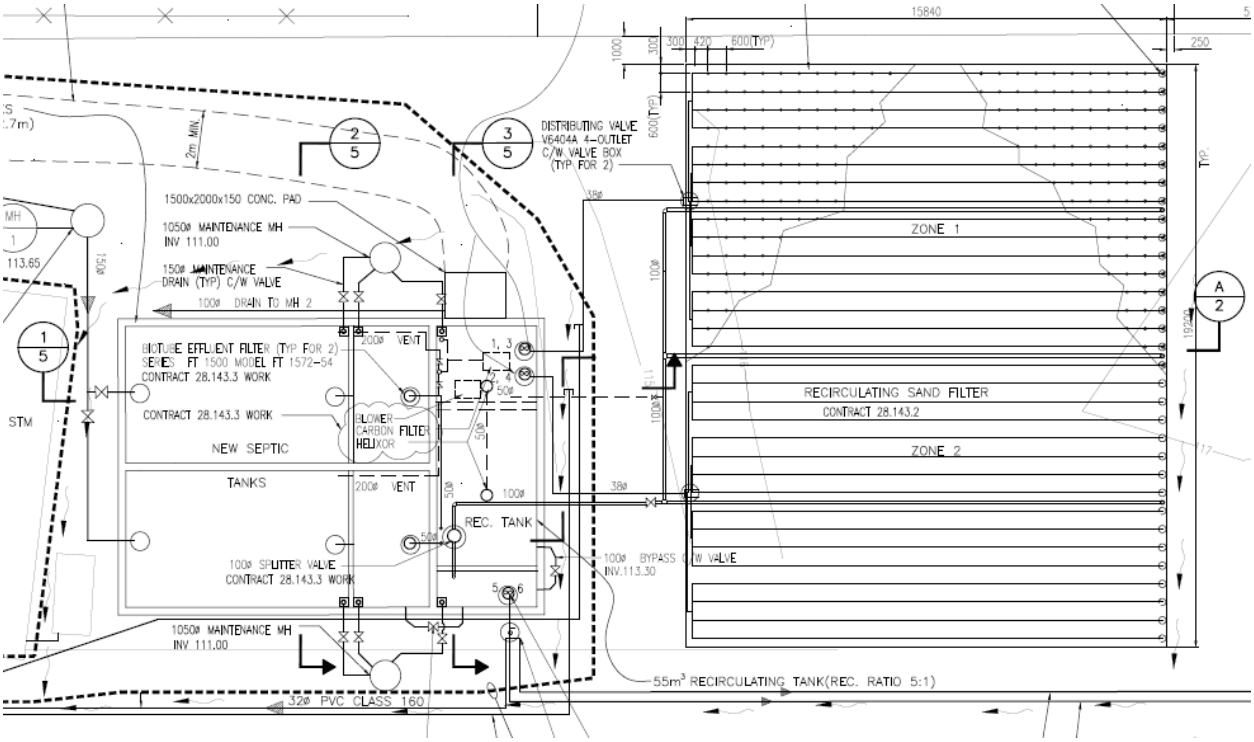


Figure 11 - Record drawings of the existing system can be seen in Appendix D for reference to the descriptions below.

6.1 Septic Tank

An equivalent 244 m^3 (54,000 Imp.gallon) septic tank is composed of two 122 m^3 cast-in place concrete tanks each with two chambers. The first chambers receive incoming sewage and begin primary treatment via settlement, where suspended solids sink to the bottom of the tank and fats, oils, and greases (FOG) rise to the top. The second chambers are equipped with Biotube Effluent Filters which further reduce particle flow enhancing further settling of solids before effluent flows to the recirculation tank.

6.2 Recirculation Tank

The recirculation tank is 55 m^3 (12,000 Imp.gallon) and is equipped with two sets of Duplex P50 OSI 07 HHF – 3 Stage ¾ HP 230VAC, single phase, 60 Hz pumps, referred to as pumps 1 & 2 and pumps 3 & 4, which deliver effluent to the recirculating sand filter via the distribution network on a cycle. Pumps 1 & 2 are activated and run for 2.7 minutes and then shut off. After 2.3 minutes of rest, pumps 3 & 4 are activated and run for 2.3 minutes. After 2.7 minutes of rest, the cycle is started over again, beginning with pumps 1 & 2. It is assumed that Pumps 1 & 2 deliver waste to Zone 1 and that pumps 3 & 4 deliver waste to Zone 2. This cycle repeats continuously, and the pumps are operated at 46.3 US gpm and 39 total dynamic head (TDH), equally distributing flow across the network. According to the SCRD, the dosing schedule can been modified so the current dosing schedule may be slightly different than described above.

6.3 Recirculating Sand Filter

The recirculating sand filter has an area of 15.8 m x 19.2 m, totalling 304 m^2, and is approximately 1 m deep. The sand filter media is noted in design drawings to be four layers composed of 150 mm of 19 mm (¾") crush gravel, followed by 600 mm of filter media that has an effective size of 1.5-3.0 mm, followed by 75 mm of 6 mm (¼") pea gravel, followed by 175 mm of 19 mm (3/4") crush gravel for the drainage media. Site conditions appeared to note that a pea gravel 5-9 mm is used full depth. A cross-section of the sand filter as described and installed by Opus can be seen in Appendix D, Figure 12.

The upper distribution network consists of 32 160 PVC laterals each with 25 – 3 mm diameter orifices, spaced 160 mm apart, for a total of 800 orifices. Each orifice is pointed upward and is equipped with a PVC orifice shield for better distribution across the sand filter.

A PVC underdrain is located within the 19 mm gravel and returns effluent to the flow splitter box. The system operates with a recirculation ratio of 5:1 which means that for every 5 parts of effluent that enters the splitter box, 1 part is delivered to the pumping tank, and 4 parts are delivered back to the recirculation tank. A cross section of the sand filter is shown below.

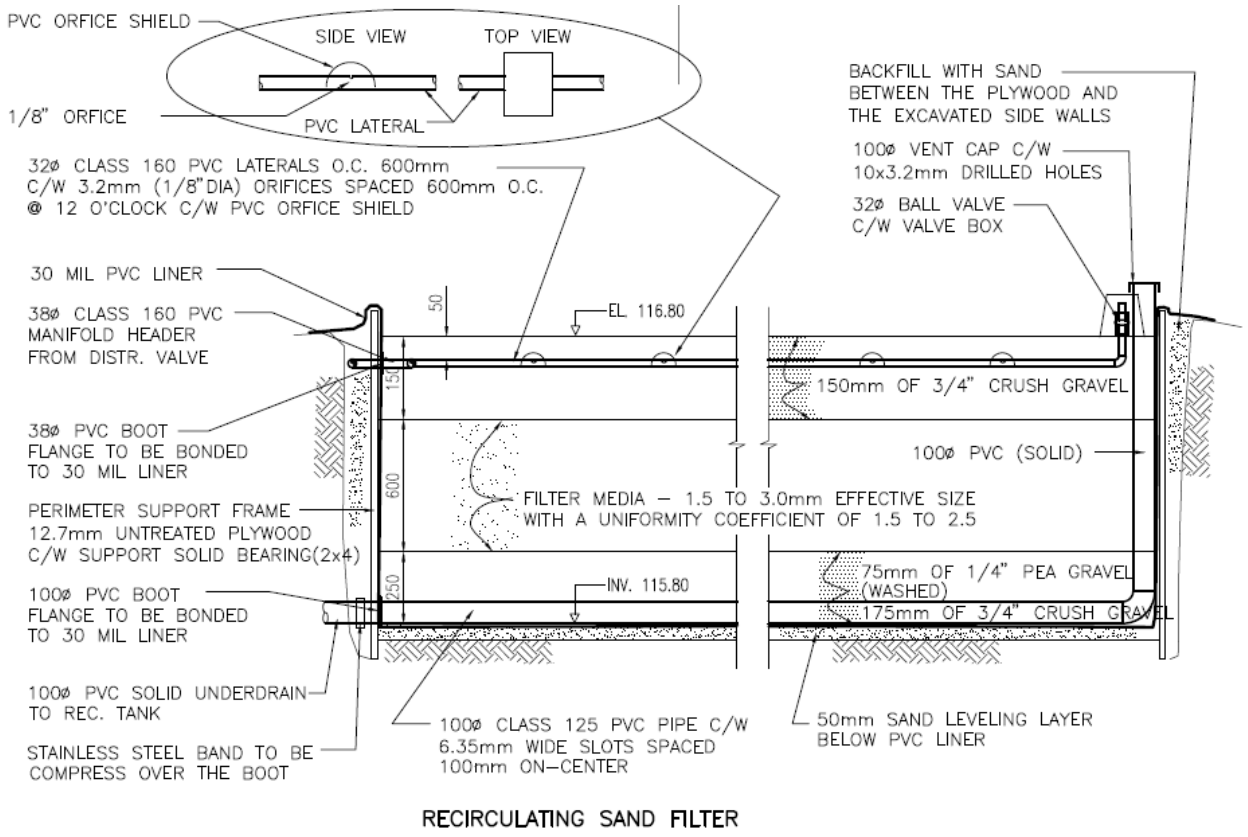


Figure 12 - Cross Section of Existing Filter

6.4 Pumping Tank

The pumping tank is located adjacent the recirculating tank. Treated effluent that is received in the pumping tank is delivered to the soil absorption system via one of two P50 OSI 07 HHF – 3 Stage ¾ HP 230VAC, single phase, 60 Hz, pumps, referred to as pump 5 and pump 6, which are run on a cycle. Each pump operates on an adjustable pump and rest time, allowing for adjustments as required. Delivery to the effluent disposal system drain fields is rotated monthly.

It is noted on the drawings that each field receives 55 m^3/day flow, during its monthly cycle, which is not in keeping with either the Permit, or actual measured flows.

6.5 Effluent Disposal System

Disposal fields 1 and 2 each consist of four sets of laterals fed by a 4-outlet V4404A distributing valve housed within a valve box. The laterals are each covered with eight 36" infiltrator chambers lined up in a row. A monitoring well is located at every other set of laterals. A third disposal field, titled Ocean View Disposal Field, is on standby. Use or discharge to the Ocean View Disposal Field is at the Operator's decision based on site observations and maintenance requirements.

7.0 Findings

In general, there are several factors which have an impact on the operations of the facilities and compliance with the Permit. Based on the review of information, we find the following key points:

- There were 10 periods where flow exceeds 75 m^3/day over one or more days, the past three years. This was most noticed during a period from December 23, 2017 until January 8, 2018 when the maximum discharge was exceeded 15 out of 17 days, at an average of 88 m^3/day. This was specifically during the holidays, and potentially maximum occupancy, as precipitation was not a factor.
- In 2018 and 2019, there were 8 other days of exceedances, and inflow and infiltration were again minor contributing flows.
- The Permit is based on about 1,000 Litres per home per day. Under the Municipal Wastewater Regulation, historical consideration has been based on about 1,300 Litres/home and an allowance for Inflow and Infiltration over the sand filter, or about 106 m^3/day, which would have negated most flow exceedances.
- The Permitted maximum discharge is inadequate to account for inflow over the filter in wet weather operation, or for infiltration because of a damaged collection system. This can be addressed longer term with the MoE as part of system modifications and updating the Permit.
- Following the plant pump-out in May 2018 and the introduction of regularly cleaning and maintenance procedures there were notable improvements in effluent quality.
- Headworks for the facility are inadequate for a proper balance of flow between the two cells.

- The septic tank volume is 244 m^3, or approximately 2.5 days of design flow, less solids accumulations. The recirculation tank has an additional 55 m^3 of storage, although it is smaller than recommended for recirculation. The pump chamber is 13.3 m^3 in capacity. There is opportunity to adjust for equalization of flows over a day to shave peak day flows through adjustment of float levels and pump timers.
- The aeration system in the recirculating tank is not operating and may be a factor in effluent quality or mixing of solids for circulation in the filter.
- The recirculating filter is a single cell that operates in zones. Individual zones cannot be isolated for maintenance purposes, meaning that the entire system must be taken offline when repairs are needed.
- The recirculating filter is near end of life, and alternatives are required to ensure secondary effluent quality can be maintained prior to discharge to the disposal fields.

8.0 Design Considerations

8.1 Sewage Flows and Permit Limits

Design considerations for the current system is 73 homes with an average of three bedrooms each at 1,360 L/home/day or 1.36 m^3/home/day, for a total of 100,640 L/day (100.6 m^3/day). Alternatively, Canada census data notes approximately 2.5 people per household, totalling 185 people for the neighbourhood. Using an average of 140 litres per capita per day (LPCD) for indoor use, this totals 25,900 L/day or 25.9 m^3/day. Doubling this value to estimate a maximum flow for the day results in 51, 800 L/day or 51.9 m^3/day, with the remainder of the Permit flow an allowance for inflow and infiltration.

As seen in section 2.2, daily discharge exceeding 75 m^3/day from 2017-2019 occurred a total of 10 times generally because of inflow and infiltration following rain events. Equalizing the flow between the recirculation tank and pump chamber can shave peak day flows, by storing flows over one day.

Adjusting timers on the effluent pumps to operate at a maximum discharge of 75 m^3/day will cause excess flows to go into storage. However, due to the likely maximum 50 m^3 of storage available in the tank, the peak flow period between December 2017 and January 2018 would still have occurred. A minor Permit Amendment to increase the allowable discharge by 10% to 82.5 m^3/day is a feasible option

to address regulatory or administrative aspects with the Ministry of Environment. It is not a consideration to add additional homes.

8.2 Headworks Improvements and Septic Tank Performance

The manual bar screen has been removed, leaving a trough and lip edge. This creates intermittent catching and clogging of solids to accumulate in the screen trough, allowing for intermittent dams, and flow redirection between the two outlet pipes discharging to the septic tanks.

Replacement of this infrastructure to remove barriers and evenly split the flow will be beneficial. The installation of a new coarse bar screen would require a continuous maintenance schedule to remove accumulated debris such as plastics, disposable wipes, and hygiene products. This would result in increased solids handling by operators; increase disposal risks; and increase operational costs.

Flow splitting is not easy with raw sewage due to solids settling or hanging up on any edges. Ideally, a sump would be provided with a higher inlet pipe, and two outlet pipes. This option is restricted on the existing setup as elevation differentials are not generally sufficient to allow the elevation changes desired.

From record drawings, we note the septic tank inlets are at 113.50 m, and the upstream manhole is at 113.65 m, and 11.5 m to the second tank inlet. Minimum grade on a 150 mm PVC pipe is 0.5%, allowing for a pipe drop of 9 cm at the manhole, which could support improved distribution at lower flows. A belled pipe entry (specialty) fitting would reduce debris holding to the pipe inlets.

An alternative would be to convert the tanks to series with one inlet, and new piping within the tanks. This option requires working in a confined space, yet offers benefits of a longer settling distance, and eliminates short circuiting. It is the more costly, and less desirable option.

8.3 Recirculation Tank Mixing

The absence of an aeration blower in the recirculation tank has likely contributed to solids build-up within the tank corners, which can lead to effluent quality issues. The two Helixor units have a bottom air inlet from the blower. As air rises, it draws in effluent and is designed to burp air, and the liquid, spraying it over the upper surface for mixing and suspending of solids, which are captured in the sand

filter. Without the blower, the solids can settle in corners and cause anaerobic zones, and incomplete effluent treatment.

8.4 Retaining the Existing Sand Filter

SCRD staff have expressed interest in the idea of keeping the current sand filter as a backup which can be used if the new system fails. This is an interesting idea that may add some peace of mind and flexibility, however; the current sand filter should be partially remediated before it is considered a reliable backup. Suggested maintenance includes but is not limited to inspecting and repairing distribution boxes, inspecting, and repairing the current distribution network, removing all vegetation from the surface of the sand filter, and replacing about 0.5 m of the media. As such, consideration for a whole replacement is considered in cost estimates

The extent of repairs will determine the capacity of the sand filter to treat wastewater on a continual basis as opposed to a backup to an alternative treatment system. The cost for repairing the existing sand filter will need to be considered with any option that includes keeping the existing filter as a backup. Additional costs will include new piping infrastructure that can accommodate two systems, allowing the operator to redirect flow to and from the recirculation tank as required.

9.0 Alternative Treatment System Options

9.1 General

The two types of systems that will be considered for this project are media-based recirculating filters and prefabricated treatment units. Media-based recirculating filters should generally be considered like-for-like by the Ministry of Environment and will likely require a minor permit amendment, while prefabricated treatment units will require a more costly new permit registration.

9.2 New Media-based Recirculating Filter

Appendix E details typical requirements of a recirculating media filter system. Recirculating sand filters have existed since the early 1900s, and although the primary principles have remained the same, minor improvements have been made throughout their iterations. Many of these improvements have made RSFs easier to inspect and maintain using well positioned inspection ports and clean-outs and a regular

maintenance schedule. The new RSF will aim to incorporate these improvements in the design to prolong the life of the filter while ensuring a high-quality effluent over its lifetime. Perhaps the most significant change is the emergence of new engineered media which is designed to have a higher void-ratio than sand or gravel, allowing greater surface area for biomass attachment and an increased capacity for air exchange.

9.3 Media-based Recirculating Filter Considerations

9.3.1 Location

There are two options regarding the location of a new filter. First, the existing sand filter can be removed, and a new filter can be built in its place. Second, it may be possible to build a new filter in the restricted area available on-site, located north of the pump hut. This would allow the existing sand filter to remain as a temporary use backup. The area is constrained by the access driveway, setbacks to property, buildings and the slopes of the existing media filter as shown below.

Figure 13 - Potential Area for Filter

The existing filter constrains the remaining available area to approximately 100 m^2. Any new filter must consider the hydraulic loading rate and biological loading rate of the selected media and the associate surface area limitations, as well as any regulatory requirements.

9.3.2 Hydraulic Loading

A hydraulic loading of at least 82.5 m^3/day forward flow will be considered for this system. This rate offers a basis for design which dictates the size of media that can be used for a given available area. Fine media has a lower hydraulic loading rate compared to coarse media. Media with a lower hydraulic loading rate consequently has a higher retention time, resulting in increased treatment potential with each pass, meaning a lower recirculation ratio is needed to produce the same quality effluent, provided there is sufficient wetting of the media to assure continued aerobic activity. This also means that fields composed of fine media need a longer resting time between doses compared to those with coarser media.

9.3.3 Dose

As described in Appendix E, standard dosing practice for a recirculating filter is 48-96 doses per day. Using a recirculation ratio of 4:1 with a forward flow of 82.5 m^3/day, the dose volume will be between 4.3 – 8.6 m^3/dose. At 100 Litres/min (26 USgpm), the existing 4 pumps would have an ON time of about 11 – 22 minutes, and an OFF time of about 4 – 8 minutes. This is higher than current pump times and will be an increase in energy costs.

Effluent quality is noted to increase with decreased dose volume and a subsequent increase in doses [3]. A higher dosing frequency will also reduce the surface area requirements; however, a balance must be achieved where the media is kept moist but not oversaturated, which is a factor of the surface area per volume.

9.3.4 Filter Media

The filter media provides an environment for bacteria to live and to aerobically digest waste found in the effluent. For this process to be successful, several key variables must be in balance. Bacteria attach

to the surface of the media and live and grow within the void-spaces that are found between adjacent media. The void-spaces provide channels for aeration and for effluent to travel through. The effluent provides the food supply for the bacteria who clean the effluent as they consume suspended and dissolved particulate. The distribution must be effective across the entire surface area to evenly saturate the surface and allow it to drain for drawing back in air around the media. This is provided by the pumps and the cycle between flooding and resting.

Potential media options that can be used to create a new filter are sand, gravel, rigid plastic media (Brentwood Industries structured-sheet plastic media), and plastic pieces (SuperBiomedia). Brentwood Industries structured-sheet plastic media is typically used in large trickling filter towers but the CFS-3000 cross flow media units can be used to retrofit shallow rock filters, making it a viable option for small projects due to its large hydraulic loading capacity [5]. A summary of the characteristics of each media option can be seen in the Table below.

Table 1 – Characteristics of Potential Media for New Media-based Recirculating Filter (Excluding Housing and Site Preparation)

Loading Characterization	Sand Media	Gravel Media	Plastic Media (Rigid)	Plastic Media (Pieces)
Hydraulic (m3/m2/day)	0.12 – 0.2	0.4 – 0.6	15 – 20	15 – 60
Organic (g/m3/day)	8 – 24	25 – 50	50 – 200	150 – 300
Media Surface Area (m2/m3)	280	69	157	600
Sloughing of Biomass	Poor	Fair	Very Good	Good
Depth of Media (m)	0.6 – 1	1-2	2-3	1-2
Filter Area (m2)	300	225	65	40
Volume of Media (m3)	300	225	120	48
Unit Rate ($/m3)	$90	$90	$360	$2,000
Material Cost	$27,000	$20,250	$43,200	$96,000

Regulatory requirements are a factor in the determination of selected media for the filter. The Ministry of Environment should generally consider plastic media as an alternative to a gravel filter based on modern practice for media selection. Of importance is the impact of the media on the environment. Small plastic media can blow away, so would require a cover. As this type of media is flexible, there is little structural integrity, requiring a fully supported cover. The rigid media will not blow away but is recommended to have a grating over top to allow for walking over to protect the edges of the media.

For gravel choices, smaller particle size will have an increased retention time, meaning that waste passes through it more slowly. A greater retention time is desirable as it allows more time for bacteria to digest waste as is passes through the media and will require a smaller recirculation ratio. As the size of media increases, retention time decreases and so more passes may be required to achieve the desired effluent quality – i.e. a higher recirculation ratio is needed. Furthermore, as media size increases, time to fouling is extended, maintenance decreases, and allowable hydraulic loading rate increases. Media life may be extended, and the field is less prone to freezing. Rigid plastic media offers the smallest footprint to accommodate site constraints, and will requires the lowest recirculation ratio, with typical ratios ranging between 1:1 and 3:1 [5].

9.3.5 Underdrain Media

The underdrain media functions to protect return piping, provide porous flow through of effluent, and provide structural support for the granular pieces of filter media. For all sand and gravel filter materials, this will typically be 25 – 50 mm drain rock. An example of a gravel filter can be seen in Appendix E.

The plastic media options do not require underdrain media but will require an underdrain collection system. Brentwood Industries structured-sheet plastic media trickling filters make use of their AccuPier Support System. An example of a structured-sheet plastic filter can be seen in Appendix H.

9.4 Orenco's AdvanTex AX100

The AdvanTex treatment was previously considered by the SCRD in other consultant reports. The system offers an alternative to traditional recirculating sand filters with a pre-built recirculating packed-bed cloth filter. The AX100 units are housed within fiberglass basins that are filled with a lightweight, engineered textile media [6]. The media is assembled in sheets that are slotted into the basins, providing a large amount of surface area for treatment, and allowing for removal for replacement. The AdvanTex system treats wastewater in the same way as a recirculating sand filter – receiving initial flow from primary treatment and recirculating treated flow through a recirculating chamber multiple times before delivering it to a disposal field.

Each AX100 unit can treat up to 18.9 m^3/day and can be installed above ground or partially buried. To meet the design flow of 82.5 m^3/day, a minimum of five AX100 units will need to be plumbed in parallel. The AX100 pods measure 4.87 x 2.43 m and require 1.0 m of space between adjacent units. In total the footprint required for this set-up would be approximately 4.87 x 17.15 m, resulting in an area of 84 m^2. The units will fit within the additional 100 m^2 available on site, or on top of the existing sand filter such that it can remain as a backup.

The primary advantage of these units is that they are pre-plumbed for easy hook-up, meaning that they can directly replace the existing filter by hooking up to the recirculation tank and flow splitting device. Additionally, the units are easy to service and maintain as the filters can be hosed off when saturated and replaced when worn out. It is expected that the filters will need to be replace approximately once every ten years.

The cost of each unit is approximately $28,700, totalling $143,500 for five units. Additional costs will include freight, site preparation, piping, installation, and registration for the new system.

Example drawings of AdvanTex units installed over the current sand filter have been provided by Opus and can be seen in Appendix F, Figure 16.

As the AdvanTex AX100 units are a modular treatment system, we have raised concerns that the change to this option would result in a significant change to the Permit, and result in a requirement to convert to the MWR Registration process. This is additional to the construction cost.

9.5 PremierTech Aqua's Ecoflo Coco Filter

The Ecoflo Coco filter is a pre-built secondary treatment unit that operates like a single-pass sand filter but makes use of a filter media derived from coconut husks instead of sand. The media has an average life expectancy of 10-15 years [7]. The SCRD has an operational example of this unit currently in operation at the Grantham's Hall septic system.

The Ecoflo Coco filters are designed to receive wastewater from an equalization tank that follows the septic tanks. The equalization tank accumulates wastewater during the daily peaks, regulating the flow supplied to the filters. A tipping bucket within the unit receives wastewater and, once full, tips over and splits the flow equally across the surface area of the filter. Wastewater is captured in the coconut husks and the organic material is consumed by bacteria. Once the filtrate reaches the bottom of the filter, it is delivered to the soil absorption system [7].

When considering a maximum daily design flow of 75 m^3/day, eighteen Ecoflo Coco Filters, model EC-7.3-P-G (polyethylene model with 7.3 m^2 of filtering media and gravity outlet), will be required to produce the desired effluent quality. A daily design flow of 75 m^3/day is considered for this approach due to the absence of recirculation.

The eighteen units will be divided into two clusters of 9 which will be fed by two pressurized flow dividers (model PFS-900C). Each cluster will receive half of the flow and each of the 9 units within the cluster will act in parallel, receiving equal volumes of wastewater. Each unit is 4.2 m long and 2.2 m wide and will require a minimum distance of 0.6 m between one another. In total the footprint required for this set-up would be approximately 19.0 m x 13.4 m, resulting in an area of 255 m^2. This would fit within the footprint of the existing sand filter.

Due to the single-pass design of these units, minor modifications to the current primary treatment system will be required. The system requires an equalization tank with a minimum volume of 25 m^3 and does not make use of recirculation. The existing 55 m^3 recirculation tank could be repurposed and used as an equalization tank. Flow from the units will drain via gravity back to the existing pump station for discharge to the disposal fields.

Wastewater characteristics are an important factor in specifying these treatment units and this system has been suggested based on the following assumed septic tank influent concentrations: 250 mg/L BOD_5; 300 mg/L TSS; 50 mg/L Total Kjeldahl Nitrogen (TKN); and 10 mg/L Total Phosphorous. The actual influent qualities are unknown.

Since this unit operates like a single pass sand filter, the MoE will not consider the replacement of the existing RSF with an Ecoflo Coco Filter system as like for like, meaning that a new registration application may be required.

An example of an Ecoflo Coco Filter system cluster can be seen in Appendix G, Figure 17. Due to the large surface area requirement for the Ecoflo Coco Filter system, it would need to be installed on top of the existing sand filter.

As noted previously, the surface of a recirculating sand filter should be free of vegetation and debris to allow for proper aeration. This raises concerns since the Ecoflo Coco Filter system would cover much of the surface of the existing filter. Furthermore, the additional weight of the units may result in compaction and a loss of void space, meaning that the treatment potential of the existing system may be compromised.

10.0 Operations and Maintenance

10.1 Primary Treatment O&M

Regular maintenance to preserve the health of the primary treatment system is important to ensure the effective treatment of wastewater. Preliminary treatment occurs in the septic tanks through settlement or sedimentation in the first chambers. Improved flow equalization to minimize solids settling will

reduce short circuiting and preferential flow to one tank over the other, as well as the potential for odours at the headworks.

During the June 18 site inspection, the operator noted that the coarse bar screen would fill with debris regularly, limiting flow to the septic tanks. Removing the bar screen is an appropriate fix but contributes to the varying flow paths to the septic tank inlets. Improvements should be considered.

Septic tank settling and the use of the BioTube effluent filter drastically reduce TSS and prepare the effluent for secondary treatment. A regular cleaning schedule can be established so that tanks and filters are cleaned before they clog. It is a potential in addition to the lack of the aerators, that long wait times in-between pump-outs allowed excess suspended solids into the recirculating tank which were then pumped into the sand filter. The cost for this maintenance will be roughly the same across all potential treatment options.

10.2 Media-based Recirculating Filter O&M

As mentioned previously, when comparing traditional media such as sand and gravel; as media size increases, time to fouling intervals extends; maintenance decreases; and allowable hydraulic loading rate increases. Furthermore, media life may be extended, and the field is less prone to freezing.

Basic maintenance requirements for a sand filter include the following:

- Measure the pressure head of the distribution network to check for clogging. If clogged, the caps at the end of each lateral can be removed one at a time while the pumps are running. This will flush the line. High pressure jetting can be used if needed [2].
- Regularly inspect the surface of the sand filter for ponding. If ponding is occurring, the dose may be too high, or the media has started to foul. Changes to the dose volume and/or recirculation ratio may remedy the situation [2].
- During inspection, remove any weeds by either hand pulling or raking. Vegetation build-up on the surface should be avoided to allow for aeration and to protect the distribution network.

Any solutions that include maintaining the existing filter should consider the cost associated with these maintenance activities. Cost will vary depending on the time required by the operator but should be limited if maintained regularly.

Alternative media options such as rigid plastic media (Brentwood Industries structured-sheet plastic media) and plastic pieces (SuperBiomedia) will have fewer maintenance requirements. The surface of these systems does not generally provide a medium for weeds to grow and the distribution networks are exposed. The increased void volume compared to sand and gravel means that effluent can travel more freely, greatly reducing the chances of clogging. Maintenance for the structured-sheet plastic media is limited to the distribution system and pumps.

10.3 Prefabricated Systems O&M

10.3.1 Orenco's AdvanTex AX100

A maintenance schedule described by AdvanTex includes monthly, quarterly, semi-annual, annual, and biannual maintenance. Subscribing to this schedule will ensure the long-term health of the system but comes at a cost.

10.3.2 PremierTech Aqua's Ecoflo Coco Filter

Annual maintenance and inspection are recommended to verify that the system is operating correctly. Annual cleaning is not generally required for these systems, as the media is sacrificial and requires periodic removal and replacement typically at 6-9 year intervals depending on loading.

10.4 Recirculation Ratio and Dosing

Costs for pumping will change depending on the recirculation ratio and dosing schedule. In general, systems that require a higher recirculation ratio will have greater costs associated with pumping. Recirculation ratios may need to be adjusted after installation depending on system performance. The following recirculation rates are expected for the systems described:

- Sand Filter: 3:1- 5:1
- Gravel Filter: 5:1-7:1

- SuperBiomeda Filter: 0.25:1-1:1
- Structured-sheet Filter: 1:1-1:3
- AdvanTex AX100: 2:1-4:1
- Ecoflo Coco Filter: N/A

10.5 Cost Comparison Summary

All potential systems will share similar costs associated with preliminary and primary treatment operations and maintenance. Maintenance costs associated with the described secondary treatment options are expected to be the greatest for the AdvanTex system and the least for the Brentwood Industries structured-sheet plastic filter. Costs associated with pumping are expected to be the greatest for a simple gravel filter and the least for the SuperBiomedia.

11.0 Recommended System Improvements

As mentioned in section 7.1, some improvements to the primary treatment system are recommended. These improvements are recommended for all treatment options if the budget allows.

Septic Tank

Woodcreek park wastewater treatment plant currently has two 122 m^3 cast-in place concrete tanks operating in parallel which perform primary treatment via settlement. It is recommended that improvements/repairs are made to ensure that flow is evenly distributed between the two tanks to allow for longer holding time, increased settlement, and slower loading of the recirculation tank.

Recirculation Tank

The aeration system is required to be operational for mixing and minimizing solids deposition, which can impact effluent quality.

12.0 Capital Costs and Life Cycle Costs

Table 2 summarizes the estimated costs of the various treatment options. These estimates are to provide grounds for comparison between potential treatment systems.

Table 2 – Estimate Capital Costs of Potential Treatment Options

Component	Gravel Filter	Media Filter	Advantex	Coco Filter
Mobilization Demobilization	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Demolition and Removal Works	$ 65,500			
Influent Headworks	$ 11,250	$ 11,250	$ 11,250	$ 11,250
Blower and Aeration	$ 19,000	$ 19,000	$ 19,000	$ 19,000
Site Preparation and Formwork	$ 76,000	$ 46,000	$ 46,000	$ 46,000
Media/Equipment Supply	$ 27,000	$ 96,000	$ 160,000	$ 170,000
Installation Piping	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Backfill and Landscaping	$ -	$ 16,000	$ 16,000	$ 16,000
Subtotal of Construction	$ 218,750	$ 208,250	$ 272,250	$ 282,250
Engineering Design and Tender	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Construction Engineering Service	$ 35,000	$ 35,000	$ 35,000	$ 35,000
MoE Registration Application	$ 10,000	$ 25,000	$ 25,000	$ 25,000
Taxes and Contingency (35%)	$ 98,000	$ 99,000	$ 122,000	$ 125,000
Estimated Construction Costs	$ 376,750	$ 382,250	$ 469,250	$ 482,250

Table 3 Life Cycle Costs of Replacement at 20 Years

Component	Gravel Filter	Media Filter	Advantex	Coco Filter
Mobilization Demobilization	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Media Replace 10 Yr	$ -	$ -	$ 10,000	$ 25,000
Media Replace 20 Yr	$ 93,000	$ -	$ 10,000	$ 25,000
Subtotal	$ 103,000	$ 10,000	$ 30,000	$ 60,000
Engineering (15%)	$ 15,450	$ 1,500	$ 4,500	$ 9,000
Taxes and Contingency (35%)	$ 41,458	$ 4,025	$ 12,075	$ 24,150
Estimated Construction Costs	$ 159,908	$ 15,525	$ 46,575	$ 93,150

Costs include an allowance for media replacement for comparative purposes in that the Coco Filter media requires replacement every ten years, and it is anticipated the gravel filter option would approach end of life at 20 years based on current experience and known ability to flush biomass from the system. Based on discussions with the SCRD Operations Staff, there is a desire to both remediate the gravel filter to ensure compliance with the existing Permit from the MoE, and to enhance the

treatment options with the installation of the Advantex cloth filter media due to operations comfort compared to the Brentwood media filter installation. Costs for this combined solution are below.

Table 4 - Combined Costs for Current Replacement and Advantex

Description	Units	Quantity	Rate	Total
Mobilization/Demobilization	lump sum	1	$ 10,000	$ 10,000
Demolition Works	lump sum	1	$ 10,000	$ 10,000
Hydrovac Gravel Removal	hourly	80	$ 225	$ 18,000
Disposal to Landfill	cu.m	300	$ 125	$ 37,500
Drain Rock	cu.m	50	$ 90	$ 4,500
Pea Gravel	cu.m	260	$ 100	$ 26,000
Base Collection Piping	lineal metre	100	$ 60	$ 6,000
Top Distribution Piping	lineal metre	530	$ 65	$ 34,450
Blower Installed	each	2	$ 9,500	$ 19,000
Headworks Manhole	each	1	$ 5,000	$ 5,000
Headworks Piping (150 dia)	lineal metre	25	$ 250	$ 6,250
Existing Liner Repairs	lump sump	1	$ 5,000	$ 5,000
Excavation for New Filter	cu.m	80	$ 75	$ 6,000
Advantex Media Filters Installed	each	5	$ 40,000	$ 200,000
Gravity Block Wall	square foot	250	$ 50	$ 12,500
TCOM Panel and electrical	lump sum	1	$ 20,000	$ 20,000
Backfill of Advantex Area	cu.m	60	$ 100	$ 6,000
Landscaping	lump sum	1	$ 10,000	$ 10,000
Subtotal of Construction				$ 436,200
Engineering Design and Tender	lump sum			$ 15,000
Construction Engineering Service	lump sum			$ 35,000
MoE Registration Application	lump sum			$ 25,000
Taxes and Contingency (35%)				$ 179,000
Estimated Construction Costs				$ 690,200

13.0 Summary

The Sunshine Coast Regional District has requested options to replace the existing recirculating filter at the Woodcreek Treatment facilities near Gibsons, BC. The works are Permitted under the Ministry of Environment, Municipal Wastewater Regulation for 75 m^3/day.

Investigations of available data and a site inspection note the recirculating filter is effectively plugged and in need of remediation or replacement. Other works were noted as either in need of improvement

(headworks) or replacement (recirculation tank mixers/aerators), and site constraints leave little area available for replacement of a similar structure without removal of the filter.

MSR examined alternative systems included replacement of the filter with the same, and secondary treatment options previously reviewed by the SCRD.

- The gravel filter replacement requires a total replacement and no redundancy in the system. It falls within the current Permit and is easily replaced.
- The option of using rigid plastic for the media filter can provide for a new location adjacent the septic tanks in the driveway area, with a footprint of about 65 m^2. For safety and to allow for foot traffic only, a grid grating is placed on top. This option is a minor change from the Permit and should be acceptable to the MoE as part of a minor Permit Amendment. It also provides for keeping the existing filter in place as a backup module.
- The Advantex media cloth filter system is very similar to the rigid media treatment polishing process using a sprayer over cloth, in an already fabricated housing. It is more costly and provides a simple operation and proven effluent quality.
- The PremierTechAqua treatment modules were considered as alternative options. Being a proprietary system with sacrificial media (peat), they are expensive and have future maintenance costs for media replacement. We believe this option will require a conversion of the Permit to the Registration process.

In addition to the treatment options prior to disposal, we have recommended improvements to the inlet piping to minimize solids plugging and to improve flow distribution.

The existing Permit is not sufficient for maximum day flows from the site. A minor Permit Amendment to increase the flow by 10%, along with minor changes to the pump circulation options to provide for flow equalization will support a reduction in flow exceedances.

Treatment options range from an estimated cost of $380,000 to provide a plastic media filter, to over $480,000 for alternative treatment systems, including engineering fees, taxes, and contingencies.

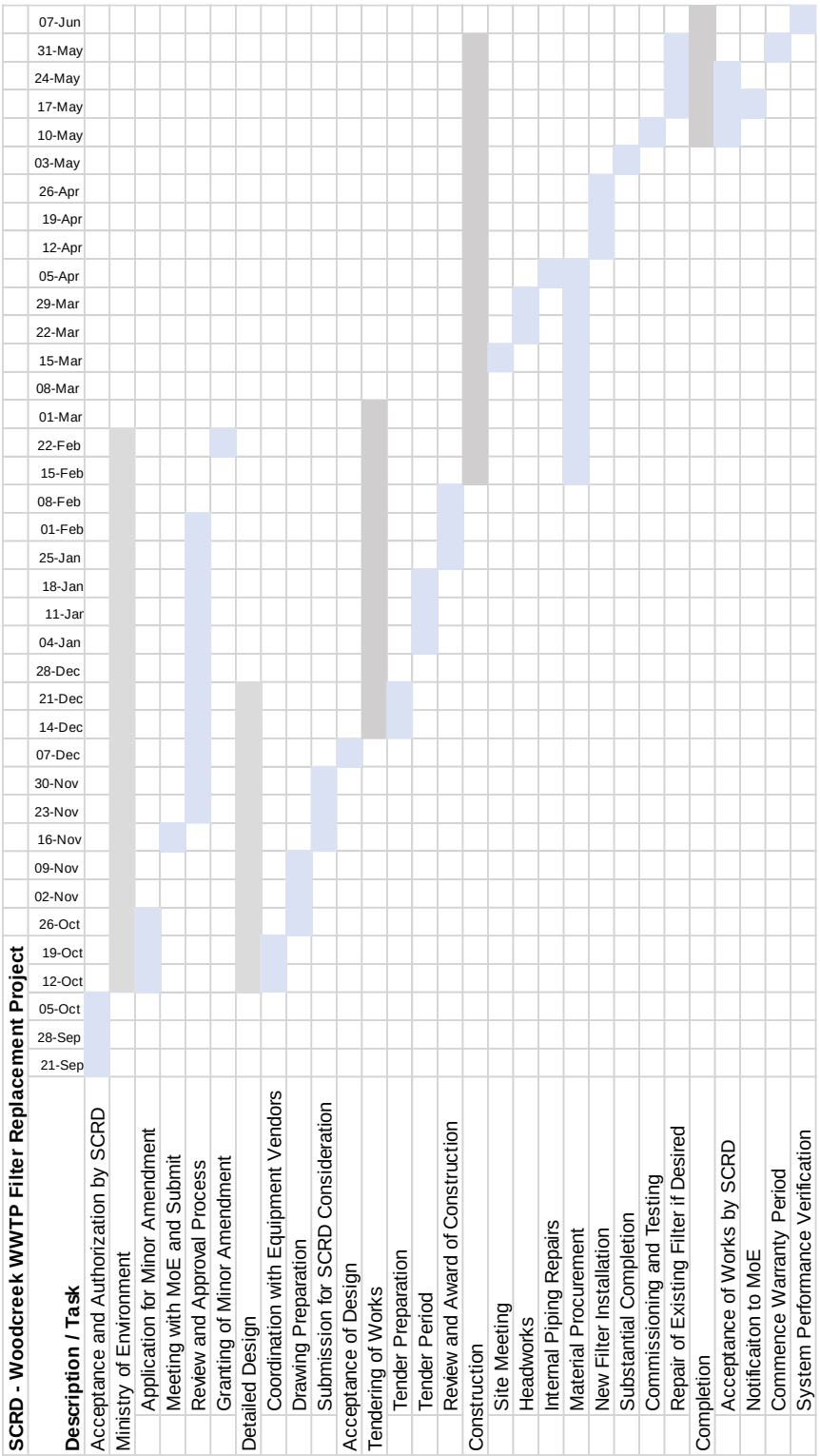
14.0 Recommendations

Based on an examination of the options available to the SCRD, the following works are recommended to provide for the improvements to the treatment system.

- Submit an Application for a Minor Permit Amendment to the Ministry of Environment to 82.5 m^3/day.
- Replace the existing headworks to remove the current screen area, and to improve flow splitting between the tanks.
- Replace and connect the air compressors to the recirculation tank Helixors to enhance mixing and treatment efficiencies.
- Complete replacement and repairs to the existing gravel filter to ensure it can remain in service as a backup system.
- Install a new recirculating filter based on the Advantex package plant cloth filter solution.

15.0 Schedule Upon Acceptance by the SCRD

Should the SCRD concur with the above steps, or as amended, MSRS will proceed with detailed design of the accepted solution, and submission of a Permit Amendment to the Ministry of Environment. The following schedule is shown for discussion purposes and can be shortened as discussed further with staff. It is ideal to have works completed in late spring, outside of the wet weather periods.


SCRD - Woodcreek WWTP Filter Replacement Project
Description / Task
07-Jun
31-May
24-May
17-May
10-May
03-May
26-Apr
19-Apr
12-Apr
05-Apr
29-Mar
22-Mar
15-Mar
08-Mar
01-Mar
22-Feb
15-Feb
08-Feb
01-Feb
25-Jan
18-Jan
11-Jar
04-Jan
28-Dec
21-Dec
14-Dec
07-Dec
30-Nov
23-Nov
16-Nov
09-Nov
02-Nov
26-Oct
19-Oct
12-Oct
05-Oct
28-Sep
21-Sep
Acceptance and Authorization by SCRD
Ministry of Environment
Application for Minor Amendment
Meeting with MoE and Submit
Review and Approval Process
Granting of Minor Amendment
Detailed Design
Coordination with Equipment Vendors
Drawing Preparation
Submission for SCRD Consideration
Acceptance of Design
Tendering of Works
Tender Preparation
Tender Period
Review and Award of Construction
Construction
Site Meeting
Headworks
Internal Piping Repairs
Material Procurement
New Filter Installation
Substantial Completion
Commissioning and Testing
Repair of Existing Filter if Desired
Completion
Acceptance of Works by SCRD
Notificaiton to MoE
Commence Warranty Period
System Performance Verification

16.0 References

[1] Onsite Wastewater Treatment Systems Technology Fact Sheet 11 - Recirculating Sand/Media Filters. pp. TFS-61-69.

[2] Minnesota Pollution Control Agency. 2013. Advance Designs for Subsurface Sewage Treatment Systems Recommended Standards and Guidance Document.

[3] Z. Hu and G. A. Gagnon, "Factors affecting recirculating biofilters (RBFs) for treating municipal wastewater," *Journal of Environmental Engineering and Science,* vol. 5, *(4),* pp. 349-357, 2006.

[4] Environment and Climate Change Canada, (2020-27-05). Daily Data Report 2017-2019 Gibsons Gower Point Station Data.

[5] Brentwood Industries, "Trickling Filters: System Components & Applications," Brentwood Industries, Morgantown, 2009.

[6] Orenco Systems, "Orenco," Orenco Systems, 1 May 2018. [Online]. Available: https://odl.orenco.com/documents/ABR-ATX-AX100-1.pdf. [Accessed 18 August 2020].

[7] Premier Tech Aqua, "Premier Tech Aqua," Premier Tech Aqua, 1 January 2020. [Online]. Available: https://www.premiertechaqua.com/wastewater-sewer-treatment-plants/ecoflo-sustainable-septic-solution. [Accessed 18 August 2020].

Appendix A – Historical Flow and Effluent Quality

Table 5 – 2017 Treated Effluent Flow

Month	Average Daily Flow (m^3/day)	Minimum Daily Flow (m^3/day)	Maximum Daily Flow (m^3/day)	Days Exceeding 75 m^3/day
January	46.3	30.4	67.6	0
February	36.8	21.2	66.4	0
March	46.6	27.3	89.8	1
April	44.4	34.3	63.1	0
May	42.7	31.7	66.5	0
June	30.2	10	48.9	0
July	29.7	19.1	49.5	0
August	28.0	25.2	31.8	0
September	26.1	14.9	33	0
October	31.0	24.4	42	0
November	42.9	29.2	53	0
December	42.2	29.7	85.2	1

Table 6 – 2018 Treated Effluent Flow

Month	Average Daily Flow (m^3/day)	Minimum Daily Flow (m^3/day)	Maximum Daily Flow (m^3/day)	Days Exceeding 75 m^3/day
January	68.0	48.0	106.5	3
February	38.7	25.2	57.7	0
March	41.9	22.0	63.9	0
April	43.5	33.0	57.3	0
May	27.5	5.4	31.9	0
June	30.0	20.8	36.6	0
July	30.9	26.9	39.1	0
August	28.0	21.2	32.1	0
September	33.1	28.2	44.0	0
October	31.7	22.8	39.3	0
November	57.5	35.4	104.9	3
December	57.9	33.0	80.8	1

Table 7 – 2019 Treated Effluent Flow

Month	Average Daily Flow (m^3/day)	Minimum Daily Flow (m^3/day)	Maximum Daily Flow (m^3/day)	Days Exceeding 75 m^3/day
January	45.8	33.8	70.8	0
February	34.7	27.6	39.9	0
March	31.8	27.5	42.4	0
April	35.6	29.2	51.8	0
May	30.0	27.9	32.0	0
June	29.1	26.5	31.4	0
July	28.9	25.7	34.2	0
August	30.3	26.3	34.9	0
September	33.7	26.8	45.1	0
October	39.0	30.6	64.6	0
November	43.5	27.6	109.3	1
December	41.1	33.0	63.2	0

Table 8 – 2005-2019 Effluent Quality

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
2005	January	N/A	N/A
	February 1	**47**	29
	March 1	38	13
	April 1	34	7
	May 1	31	10
	June 1	**113**	20
	July	N/A	N/A
	August 1	**137**	18
	September	N/A	N/A
	October 1	**95**	37
	November	N/A	N/A
	December	N/A	N/A
2006	January	N/A	N/A
	February	N/A	N/A
	March 1	31	13
	April	N/A	N/A
	May 1	26	17

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
	June 1	24	11
	July	N/A	N/A
	August	N/A	N/A
	September	N/A	N/A
	October 1	18	6
	November 1	21	9
	December 1	44	11
2007	January	N/A	N/A
	February 19	36	19
	March 27	29	8
	April 25	41	13
	May 28	30	20
	June 25	20	12
	July 17	24	9
	August 15	18	12
	September 26	20	16
	October 29	27	13
	November 27	29	16
	December 11	29	41
2008	January	N/A	N/A
	February 21	**66**	15
	March 26	45	18
	April 16	33	16
	May 21	37	12
	June 9	38	10
	July 23	26	16
	August 28	23	10
	September 29	24	7
	October 27	37	10
	November 17	32	13
	December 9	31	12
2009	January 27	45	12
	February 11	42	18
	March 17	**47**	20
	April 27	35	29

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
	May 20	36	13
	June 10	22	9
	July 28	29	7
	August 26	25	14
	September 16	27	8
	October 1	35	11
	October 28	36	13
	November 12	38	19
	December 8	**50**	15
	December 17	**49**	18
	December 29	35	11
2010	January 14	36	13
	February 10	**46**	23
	March 11	43	12
	April 8	39	7
	May 6	43	14
	June 3	**56**	14
	July 14	27	15
	August 12	32	8
	September 8	30	14
	October 7	35	14
	October 20	22	11
	November 3	32	10
	December 1	**67**	30
	December 15	34	12
2011	January 6	40	14
	February 14	39	14
	March 8	37	13
	April 20	35	7
	May 5	40	11
	June 16	25	8
	July 19	33	12
	August 17	26	9
	September 15	20	6
	October 26	32	10

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
	November 23	29	9.8
	December 8	32	8.8
2012	January	N/A	N/A
	February 2	45	15
	February 16	**55**	14
	March 27	**49**	18
	April 12	**80**	18
	May 23	31.2	20.5
	June 7	**52.9**	12.5
	July 12	**176**	21
	August 7	**167**	26
	September 5	25	28.5
	October 3	26.2	8.5
	November 14	22.9	10
	December 11	19.9	10
2013	January	N/A	N/A
	February	N/A	N/A
	March 21	**56.9**	16
	April 30	38.1	16
	May 16	**191**	**66**
	June 12	36.6	15.5
	July 30	**169**	33.3
	August 26	**114**	N/A
	September 19	44	19.5
	October 23	0	17.5
	November 27	**92.4**	22
	December 12	**99.3**	22.7
2014	January 14	**73**	31.4
	February 12	**78**	28
	March 10	**88.2**	20
	April 23	**181**	25.3
	May 21	**182**	27
	June 19	**84.3**	22
	July 16	**99.8**	0
	August 27	**71.4**	0

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
	September 25	**77.7**	24
	October 21	**56.1**	35
	November 18	**68.2**	19
	December 2	**67**	14.5
2015	January 28	**87.3**	22
	February 26	**75**	19.7
	March 26	**94.2**	21
	April 29	**172**	32
	May 28	**213**	41
	June 24	**189**	41.5
	July	N/A	N/A
	August 13	**179**	59
	September 23	**156**	40
	October 22	**182**	42
	November 25	**124**	28
	December 9	**90.2**	21.5
2016	January 28	**75.9**	25
	February 25	**163**	30.4
	March 14	**77.9**	26
	April 21	**211**	**49**
	May 30	**143**	38
	June	N/A	N/A
	July 4	**120**	38
	August 31	**53.7**	26
	September 15	**59.3**	18.3
	October 27	**52.1**	17
	November 28	**54**	28.5
	December 14	**81.4**	36.8
2017	January 26	**102**	38
	February 20	**131**	30.4
	March 16	**202**	34
	April 27	**187**	42
	May 29	**198**	**47**
	June 28	**247**	**79**
	July 26	**93**	41

Year	Sampling Date	BOD (mg/L)	TSS (mg/L)
	August 23	**71.4**	22
	September 20	**55.1**	**131**
	October 18	**58.2**	**152**
	November 15	**49.3**	**172**
	December 6	**131**	**124**
2018	January 8	**80.2**	**61**
	February 14	**214**	**371**
	March 13	**131**	31
	April 16	**139**	25
	May 7	**124**	36.6
	June 12	8.4	10.5
	July 11	N/A	14
	August 16	N/A	38.5
	September 12	N/A	**191**
	September 26	N/A	17.5
	October 25	N/A	13.3
	November 15	10	18.3
	December 10	N/A	22.3
2019	January 10	17	**52.8**
	February 11	23	33.2
	March 12	17.8	**61**
	April 16	14	**53.5**
	May 10	13	30
	June 10	14	13
	July 10	8	7
	August 6	7	9
	September 11	11	20
	October 9	10	7.5
	November 12	14	13
	December 3	12	26

Appendix B – Gibsons Gower Point Station Precipitation Data [4]

The Gibsons Gower Point precipitation (PPT) data for 2017-2019 is summarized in Table 7 – 9. Average daily PPT was determined by summing all daily PPT values for the month and then dividing by the number of days. Total monthly PPT was determined by summing all daily PPT values for the month.

Table 9 – Gibsons Gower Point 2017 PPT Data

Month	Average Daily PPT (mm)	Min Daily PPT (mm)	Max Daily PPT (mm)	Total Monthly PPT (mm)
January	3.7	0.0	30.4	114.0
February	4.5	0.0	26.2	126.0
March	6.9	0.0	42.0	213.0
April	4.8	0.0	31.8	144.4
May	4.3	0.0	44.0	125.6
June	1.6	0.0	23.8	48.0
July	0.1	0.0	2.2	3.4
August	0.4	0.0	10.6	11.2
September	2.4	0.0	32.2	73.0
October	3.2	0.0	35.4	99.8
November	8.9	0.0	36.8	267.6
December	3.4	0.0	27.4	99.4

Table 10 – Gibsons Gower Point 2018 PPT Data

Month	Average Daily PPT (mm)	Min Daily PPT (mm)	Max Daily PPT (mm)	Total Monthly PPT (mm)
January	8.7	0.0	39.6	270.4
February	4.4	0.0	21.0	122.2
March	4.2	0.0	33.6	130.4
April	5.4	0.0	22.6	162.0
May	0.1	0.0	2.8	3.8
June	2.4	0.0	23.8	68.0
July	0.2	0.0	3.8	7.0
August	0.1	0.0	1.6	2.6
September	5.2	0.0	36.6	156.0
October	3.5	0.0	20.6	107.6
November	8.0	0.0	65.8	240.8
December	9.3	0.0	36.4	279.0

Table 11 – Gibsons Gower Point 2019 PPT Data

Month	Average Daily PPT (mm)	Min Daily PPT (mm)	Max Daily PPT (mm)	Total Monthly PPT (mm)
January	4.8	0.0	33.0	143.6
February	2.1	0.0	15.4	56.8
March	1.2	0.0	13.2	35.8
April	3.4	0.0	18.4	99.2
May	1.1	0.0	10.6	33.2
June	1.4	0.0	15.2	32.6
July	1.5	0.0	13.6	45.6
August	1.3	0.0	16.2	39.6
September	4.3	0.0	28.5	127.9
October	4.3	0.0	33.6	129.0
November	4.6	0.0	53.0	137.6
December	6.7	0.0	40.2	208.2

Appendix C – Daily Flow and Sand Filter Inflow Estimation

The daily flow as reported by in the SCRD logs, daily precipitation data from Gibsons Gower Point Station [4], and an estimate of possible inflow to the sand filter, for 2017-2019 can be seen in Table 10, Table 11, and Table 12, respectively. The comparison of daily flow and possible daily inflow is useful for determining if flows that exceeded the 75 m^3/day permit limit could be solely the result of direct inflow into the sand filter. Days with excess flow have been bolded.

Example Calculation of Daily Inflow

1) Daily PPT converted from mm to m

   Daily PPT: $21.2\ mm\ x\ \frac{1\ m}{1000\ mm} = 0.0212\ m$

2) Using a surface area of 304 m^2 and assuming 100% of daily PPT enters the field:

   Daily Inflow: $0.0212\ m\ x\ 304\ m^2 = 6.4\ m^3$

Table 12 – 2017 Daily Flow and Inflow Estimate

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
January	8	39.9	21.2	6.4
	11	39.0	0.0	0.0
	17	34.4	28.6	8.7
	20	67.6	2.4	0.7
	21	66.5	0.6	0.2
	22	52.7	9.8	3.0
	24	45.5	0.0	0.0
	26	49.0	0.0	0.0
	29	30.4	1.2	0.4
	31	38.5	0.0	0.0
February	1	34.3	0.0	0.0
	2	29.7	4.6	1.4
	7	21.2	0.0	0.0
	8	23.0	18.8	5.7
	9	29.9	11.6	3.5
	13	39.9	0.0	0.0
	14	37.4	26.2	8.0
	16	66.4	0.0	0.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	19	43.2	5.6	1.7
	20	43.6	0.0	0.0
	22	41.0	0.0	0.0
	23	35.1	8.2	2.5
	26	34.3	0.0	0.0
March	2	35.1	2.6	0.8
	5	31.7	5.4	1.6
	6	39.7	6.2	1.9
	9	36.2	8.6	2.6
	12	38.6	15.2	4.6
	13	55.8	8.2	2.5
	14	38.2	1.2	0.4
	15	57.4	3.8	1.2
	16	27.3	3.6	1.1
	23	43.9	8.2	2.5
	26	40.4	12.8	3.9
	27	54.8	13.6	4.1
	28	46.0	42.0	12.8
	29	64.8	8.6	2.6
	30	**89.8**	**0.0**	**0.0**
April	2	63.1	0.0	0.0
	4	45.7	14.2	4.3
	6	43.2	11.6	3.5
	9	48.0	3.2	1.0
	11	47.3	1.8	0.5
	12	41.8	31.8	9.7
	17	54.7	8.0	2.4
	20	41.0	0.0	0.0
	21	42.3	0.0	0.0
	23	36.9	5.6	1.7
	25	42.7	2.6	0.8
	27	35.7	0.0	0.0
	30	34.3	1.4	0.4
May	1	45.3	2.2	0.7
	2	32.9	15.8	4.8

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	7	39.6	8.2	2.5
	8	41.9	0.0	0.0
	9	40.8	0.0	0.0
	14	33.8	0.0	0.0
	16	48.8	0.4	0.1
	17	66.5	0.0	0.0
	18	54.3	0.0	0.0
	19	48.8	0.0	0.0
	25	38.2	0.0	0.0
	28	34.3	0.0	0.0
	29	41.0	0.0	0.0
	31	31.7	7.6	2.3
June	2	20.8	0.0	0.0
	4	30.4	0.0	0.0
	5	44.3	0.0	0.0
	6	26.1	0.0	0.0
	7	31.8	7.2	2.2
	8	21.0	23.8	7.2
	11	37.5	0.0	0.0
	12	48.9	0.0	0.0
	13	35.4	0.0	0.0
	16	21.8	0.0	0.0
	18	32.4	1.0	0.3
	19	47.5	0.0	0.0
	23	29.1	0.0	0.0
	25	30.9	0.0	0.0
	26	37.2	0.0	0.0
	26	10.0	0.0	0.0
	27	28.6	0.0	0.0
	28	17.2	0.0	0.0
	29	23.8	0.0	0.0
July	4	30.8	0.0	0.0
	6	28.9	0.0	0.0
	9	27.7	0.0	0.0
	10	49.5	0.0	0.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	11	34.5	0.0	0.0
	12	26.9	0.0	0.0
	13	28.3	0.0	0.0
	14	19.1	0.0	0.0
	16	28.5	0.0	0.0
	17	43.8	0.0	0.0
	18	29.5	0.0	0.0
	19	26.2	1.2	0.4
	20	27.0	0.0	0.0
	21	24.8	2.2	0.7
	23	27.7	0.0	0.0
	24	29.3	0.0	0.0
	26	28.1	0.0	0.0
	28	25.3	0.0	0.0
	30	26.6	0.0	0.0
	31	31.7	0.0	0.0
August	1	27.1	0.0	0.0
	4	28.1	0.0	0.0
	10	30.2	0.0	0.0
	11	25.2	0.0	0.0
	13	27.1	0.0	0.0
	14	31.8	0.0	0.0
	16	26.6	0.0	0.0
	17	26.6	0.0	0.0
	18	28.5	0.0	0.0
	21	26.6	0.0	0.0
	22	31.8	0.0	0.0
	23	27.3	0.0	0.0
	24	27.9	0.0	0.0
	27	27.6	0.0	0.0
	28	27.5	0.0	0.0
	30	28.5	0.0	0.0
September	3	30.0	0.0	0.0
	5	14.9	0.0	0.0
	6	23.7	0.0	0.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	7	26.6	0.6	0.2
	10	26.4	0.0	0.0
	12	31.6	0.0	0.0
	13	18.8	0.0	0.0
	15	33.0	0.0	0.0
	17	21.8	5.4	1.6
	20	31.8	0.0	0.0
	24	27.9	0.8	0.2
	27	26.5	0.0	0.0
October	1	26.3	0.0	0.0
	3	32.2	0.0	0.0
	5	24.4	0.0	0.0
	16	31.6	5.2	1.6
	18	26.3	35.4	10.8
	22	38.4	1.0	0.3
	24	42.0	0.8	0.2
	25	26.3	0.8	0.2
	27	29.4	0.0	0.0
	29	30.9	0.0	0.0
	30	30.4	0.0	0.0
	31	34.5	0.0	0.0
November	7	30.3	0.0	0.0
	10	29.2	0.0	0.0
	15	47.7	12.4	3.8
	17	49.1	0.6	0.2
	20	53.0	3.6	1.1
	24	50.0	1.4	0.4
	27	41.0	8.8	2.7
	29	42.7	3.2	1.0
December	1	40.5	4.6	1.4
	6	40.9	0.0	0.0
	8	30.3	0.0	0.0
	11	36.3	0.0	0.0
	12	30.7	0.0	0.0
	14	29.7	0.8	0.2

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	15	32.0	0.0	0.0
	19	42.5	0.0	0.0
	22	53.8	0.0	0.0
	29	**85.2**	**25.4**	**7.7**

As seen in Table 10, daily flows that were more than 75 m^3/day in 2017 occurred on March 30 (89.9 m^3) and December 29 (85.2 m^3) with estimated daily inflows of 0.0 m^3 and 7.7 m^3, respectively. The data presented here does not support the hypothesis that direct inflow through the surface of the sand filter is the sole contributor to excess flow, as the flow exceeding 75 m^3/day is not balanced by estimated inflow, suggesting that infiltration may be an issue.

Table 13 – 2018 Daily Flow and Inflow Estimate

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
January	**2**	**106.5**	**0.0**	**0.0**
	4	68.9	5.4	1.6
	8	**83.9**	**9.6**	**2.9**
	12	48.0	15.4	4.7
	15	53.9	1.6	0.5
	19	50.1	16.4	5.0
	22	67.5	3.0	0.9
	26	54.7	17.0	5.2
	29	63.9	3.2	1.0
	31	**82.7**	**8.8**	**2.7**
February	2	47.3	2.8	0.9
	5	57.7	0.6	0.2
	8	38.2	0.0	0.0
	9	37.0	0.0	0.0
	12	39.6	0.0	0.0
	14	25.2	0.0	0.0
	15	31.0	6.2	1.9
	19	39.6	0.0	0.0
	26	37.3	2.0	0.6
	28	34.5	12.4	3.8
March	2	48.3	6.8	2.1

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	5	57.3	0.0	0.0
	8	22.0	20.8	6.3
	15	33.8	0.0	0.0
	16	30.9	0.0	0.0
	19	35.9	0.0	0.0
	23	32.3	8.0	2.4
	27	52.7	1.0	0.3
	29	63.9	6.2	1.9
April	3	43.2	0.0	0.0
	9	46.4	0.6	0.2
	12	42.0	7.2	2.2
	16	57.3	8.4	2.6
	19	49.6	0.0	0.0
	23	38.3	0.0	0.0
	26	33.0	0.0	0.0
	30	38.0	0.0	0.0
May	4	31.0	0.0	0.0
	7	31.2	0.0	0.0
	10	28.7	0.0	0.0
	14	30.2	0.0	0.0
	18	28.1	0.0	0.0
	22	29.4	0.0	0.0
	25	29.5	0.0	0.0
	28	31.9	0.0	0.0
	30	29.3	0.0	0.0
	31	5.4	0.0	0.0
June	1	30.6	1.6	0.5
	4	30.3	0.0	0.0
	6	27.8	0.0	0.0
	7	22.6	1.6	0.5
	8	32.7	23.8	7.2
	12	32.0	7.0	2.1
	13	31.4	5.8	1.8
	14	20.8	0.0	0.0
	18	30.2	0.0	0.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	21	33.0	0.0	0.0
	25	32.6	0.0	0.0
	27	29.5	0.0	0.0
	30	36.6	0.8	0.2
July	3	39.1	0.0	0.0
	5	30.1	0.0	0.0
	9	29.5	1.6	0.5
	11	29.6	0.0	0.0
	13	29.8	0.0	0.0
	16	31.6	0.0	0.0
	23	30.2	0.0	0.0
	26	26.9	0.0	0.0
	30	31.8	0.0	0.0
August	2	30.2	0.0	0.0
	7	28.1	0.0	0.0
	9	28.5	0.0	0.0
	13	28.9	0.0	0.0
	16	24.7	0.0	0.0
	20	29.1	0.0	0.0
	23	29.1	0.0	0.0
	27	32.1	0.0	0.0
	29	28.1	0.0	0.0
	30	21.2	0.0	0.0
September	4	31.2	0.0	0.0
	10	31.0	8.6	2.6
	12	28.2	4.2	1.3
	13	28.2	1.0	0.3
	17	35.0	1.0	0.3
	18	31.1	0.0	0.0
	19	29.0	0.0	0.0
	21	35.9	24.0	7.3
	24	44.0	0.0	0.0
	26	37.7	0.0	0.0
October	1	36.9	2.6	0.8
	5	35.4	0.4	0.1

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	9	35.4	0.0	0.0
	11	30.9	0.0	0.0
	12	30.8	0.0	0.0
	15	22.8	0.0	0.0
	19	28.3	0.0	0.0
	22	29.1	0.0	0.0
	25	28.5	18.2	5.5
	29	39.3	7.0	2.1
November	1	48.1	27.0	8.2
	2	**80.2**	**1.8**	**0.5**
	9	55.1	1.0	0.3
	13	40.0	23.2	7.1
	15	44.2	4.8	1.5
	16	47.0	0.0	0.0
	19	35.4	0.0	0.0
	23	36.4	1.4	0.4
	27	58.5	2.2	0.7
	28	**104.9**	**17.8**	**5.4**
	29	**82.7**	**1.8**	**0.5**
December	3	47.7	0.0	0.0
	7	33.0	1.0	0.3
	10	39.3	9.8	3.0
	11	63.3	17.6	5.4
	13	72.8	22.8	6.9
	17	**80.8**	**19.4**	**5.9**
	20	62.6	12.6	3.8
	24	64.7	0.0	0.0
	27	51.1	7.6	2.3
	31	64.0	0.0	0.0

As seen in Table 11, daily flows that were more than 75 m^3/day in 2018 occurred on January 2 (106.5 m^3), January 8 (83.9 m^3), January 31 (82.7 m^3), November 2 (80.2), November 28 (104.9), November 29 (82.7), and December 17 (80.8) with estimated daily inflows of 0.0 m^3, 2.9 m^3, 2.7 m^3, 0.5 m^3, 5.4 m^3, 0.5 m^3, and 5.9 m^3, respectively. The data presented here does not support the hypothesis that direct inflow through the surface of the sand filter is the sole contributor to excess flow, as the flow exceeding 75

m^3/day is not balanced by estimated inflow for all dates. December 17, 2018 is the exception, where daily flow was 80.8 m^3 and inflow was estimated as 5.9 m^3. Here, subtracting inflow from daily flow results in a flow of 74.9 m^3.

Table 14 – 2019 Daily Flow and Inflow Estimate

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
January	3	57.6	24.2	7.4
	7	70.8	0.0	0.0
	10	43.3	1.2	0.4
	14	41.8	0.0	0.0
	15	33.8	0.0	0.0
	17	38.5	13.8	4.2
	21	39.2	1.2	0.4
	24	50.8	0.0	0.0
	28	36.2	0.0	0.0
February	1	34.8	3.2	1.0
	4	27.6	0.0	0.0
	7	33.6	0.0	0.0
	11	32.6	2.6	0.8
	20	36.6	0.0	0.0
	22	37.5	0.0	0.0
	25	39.9	0.0	0.0
March	4	42.4	0.0	0.0
	12	31.8	0.0	0.0
	14	30.5	3.4	1.0
	18	31.6	0.0	0.0
	21	27.5	0.0	0.0
	25	29.2	13.2	4.0
	27	29.6	0.0	0.0
April	1	30.9	0.0	0.0
	4	29.2	3.4	1.0
	8	31.1	1.0	0.3
	11	33.1	11.0	3.3
	16	36.1	0.6	0.2
	18	33.8	15.4	4.7
	20	51.8	0.0	0.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	24	41.8	0.0	0.0
	26	36.0	0.0	0.0
	29	32.6	0.0	0.0
May	6	30.5	0.0	0.0
	9	32.0	0.0	0.0
	13	29.8	0.4	0.1
	16	30.7	1.6	0.5
	21	29.1	0.0	0.0
	24	31.7	2.6	0.8
	27	28.5	0.0	0.0
	31	27.9	0.0	0.0
June	3	26.5	0.0	0.0
	5	27.9	0.4	0.1
	10	29.5	0.0	0.0
	12	30.1	0.0	0.0
	18	29.4	0.0	0.0
	21	29.4	0.0	0.0
	26	28.3	15.2	4.6
	28	31.4	0.0	0.0
July	2	25.7	0.0	0.0
	4	34.2	0.0	0.0
	8	32.3	0.0	0.0
	12	28.3	0.0	0.0
	15	26.2	0.0	0.0
	18	27.5	0.4	0.1
	23	30.9	2.4	0.7
	26	26.0	12.2	3.7
	29	28.6	0.0	0.0
August	2	26.3	0.0	0.0
	6	28.1	0.0	0.0
	8	28.8	0.0	0.0
	12	30.5	0.0	0.0
	16	31.6	0.0	0.0
	19	34.9	0.0	0.0
	23	28.8	1.0	0.3

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	26	33.8	0.0	0.0
	30	30.0	0.0	0.0
September	3	32.3	0.0	0.0
	6	26.8	0.0	0.0
	9	29.0	0.0	0.0
	11	30.0	2.0	0.6
	16	32.9	16.6	5.0
	19	41.0	0.8	0.2
	20	31.4	0.0	0.0
	24	45.1	0.0	0.0
	30	34.9	0.0	0.0
October	3	30.6	2.2	0.7
	4	34.2	0.0	0.0
	7	32.1	2.0	0.6
	10	31.7	0.0	0.0
	15	33.7	14.2	4.3
	16	37.1	13.6	4.1
	18	45.5	8.8	2.7
	21	47.1	33.6	10.2
	24	64.6	2.8	0.9
	29	33.1	0.0	0.0
November	4	31.3	0.0	0.0
	8	27.6	1.6	0.5
	12	30.7	3.4	1.0
	14	32.9	9.8	3.0
	17	41.2	3.8	1.2
	18	**109.3**	**9.2**	**2.8**
	21	49.3	0.0	0.0
	26	34.9	0.0	0.0
	29	34.0	0.0	0.0
December	3	35.3	2.4	0.7
	6	33.0	5.4	1.6
	9	33.8	0.0	0.0
	10	33.2	3.8	1.2
	13	37.8	3.2	1.0

Month	Date	Daily Flow (m^3/day)	Daily PTT (mm)	Daily Inflow (m^3/day)
	16	45.8	2.4	0.7
	19	46.4	19.4	5.9
	24	63.2	3.2	1.0
	27	42.9	1.2	0.4
	30	39.5	40.2	12.2

As seen in Table 12, daily flows that were more than 75 m^3/day in 2019 occurred on November 18 (109.3 m^3) with an estimated daily inflow of 2.8 m^3. The data presented here does not support the hypothesis that direct inflow through the surface of the sand filter is the sole contributor to excess flow, as the flow exceeding 75 m^3/day is not balanced by estimated inflow. Studies into other sources of inflow and infiltration may be beneficial if flow issues persist.

Appendix D – Record Drawings of Current System

Appendix E – General Design Parameters for Recirculating Sand Filters

A recirculating sand filter system consists of a standard septic tank, a recirculation tank, a pumping tank, a sand filter, a flow splitter, and an effluent disposal system.

Septic Tank

The septic tank acts as a receiving chamber for the raw wastewater coming from the community and works to separate the suspended solids from the wastewater through the process of settlement. During this process, solids are separated from waste and settle to the bottom of the tank while the remaining wastewater travels through an outlet toward the pump chamber. This is a very important step in the process as it is imperative that as many solids are removed as possible before the wastewater enters the sand filter. Failure to remove the bulk of the solids before the sand filter can quickly result in ponding and a failed system. Regular inspections of the septic tank and a consistent clean out schedule will help to keep the system running properly. Final septic tank should be equipped with effluent screens and a high-water alarm. Effluent screens must be sized smaller than the pressure distribution perforation diameter.

Recirculation/Pumping Tank

The recirculation/pumping tank receives septic tank effluent and treated effluent from the sand filter. Treated effluent from the sand filter will have significantly less TSS and BOD than septic tank effluent and acts to dilute the wastewater, reducing odours. Depending on the requirements of the system, the tanks are designed to either remain full or to be pumped down during periods of low wastewater flows [1].

Systems which have tight treatment performance parameters, such as those that treat single-family home systems, are designed to remain full and are typically sized to be 1.5 times the design peak daily flow. Depending on the existing volume of waste in the tank, filtrate exiting the sand filter will either re-enter the recirculation chamber or be discharged to the effluent disposal system. If the tank is full, filtrate will be discharged to the effluent disposal system. This is commonly controlled by a ball float valve, seen in Figure 1, which acts to seal entry to the tank if it is full. If the tank is not full, the filtrate re-enters the tank and mixes with waste received from the septic tank.

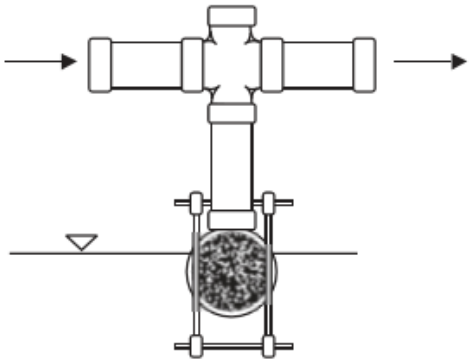


Figure 14 – Float Ball Valve Flow Splitter

Systems with large, more continuous flows, such as those that treat small communities, are designed to continuously split flow leaving the sand filter via an external flow splitting structure according to a recirculation ratio ranging from 3:1-7:1. This means that for every one part of filtrate that is delivered directly to the effluent disposal system, 3-7 parts re-enter the pump chamber to be delivered back to the sand filter. An of external flow splitting structures can be seen in Figure 2. The recirculation ratio of this flow splitter could be modified by capping unneeded pipes.

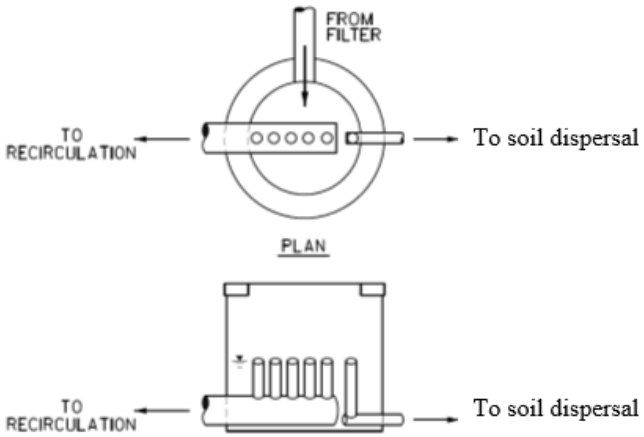


Figure 15 – External Flow Splitter

A higher recirculation ratio generally provides higher treatment, although it requires more energy to pump the wastewater through the filter each time. Ratios that exceed 7:1 can deplete alkalinity due to

complete nitrification and drop pH below acceptable levels. A low pH can allow filamentous organisms to form, which can lead to clogging in the distribution system [2].

Determining the appropriate recirculation ratio to meet the desired effluent quality is an iterative process and requires careful monitoring. For this reason, a flow splitting structure that can allow for adjustments of the recirculation ratio is desirable [2].

In both designs it is always important to have control over the volume of fluid entering and exiting the chamber to maintain the dosing cycle. For this reason, it is imperative that the system is tightly sealed and not susceptible to infiltration due to rain or other events.

Dose

A set dose is delivered from the pump chamber to the sand filter at a pre-determined frequency. The dose is determined based on the design flow, recirculation ratio, and the desired frequency. Typical dose frequencies are 48 times/day but can be as high as 96 times/day. Research suggests that higher dose frequency, with subsequently lower dose volume, will increase the BOD and TSS reductions of the system [3].

Small dose volumes allow the system to work more effectively because the wastewater can flow through the media at unsaturated conditions with higher moisture tensions. It is important to achieve a balance that keeps the media moist and provides enough food to maintain the bacteria populations, while keeping the media in an unsaturated state. Lastly, since this is an aerobic process, reaeration between doses is important to allow bacteria access to air to digest the waste.

Mass Loading

Media filters are typically designed based on hydraulic loading with the following parameters [1]:

Sand (1.0 – 5.0 mm): 3-5 gpd/ft^2 or 0.12-0.2 m^3/m^2

Gravel (3.0 – 20.0 mm): 10-15 gpd/ft^2 or 0.4-0.6 m^3/m^2

Alternatively, if influent qualities are known, design can be based on organic loadings:

Sand (1.0 – 5.0 mm): Up to 5 lb BOD_5/1000ft^2 or 0.02275 kg/m^2

Gravel (3.0 – 20.0 mm): Up to 15 lb BOD_5/1000ft^2 or 0.06825 kg/m^2

Distribution Network

The distribution network's primary function is to evenly distribute the dose across the media surface of the sand filter. Even distribution is important for effective effluent polishing as most bacteria will exist within the upper 9-15 inches of the sand filter. The distribution network can be pressure or gravity driven using orifices, spray nozzles, or drip emitters. If using orifices, it is recommended to use upward facing orifices with shields to minimize the potential for blockage and to allow air back into the pipe. In this case, a few downward facing orifices will be required to drain the pipe.

The system should maintain a minimum head that can be monitored at the end of laterals. An increase in head over time could indicate clogging. Inspection ports and cleanouts should be included for regular monitoring and maintenance.

Sand Filter

The sand filter provides an environment for bacteria to aerobically digest waste found in the effluent. For this process to be successful, several key variables must be in balance. The sand filter is composed of a filter liner, inspection pipes, distribution media, filter media, underdrain media, and an underdrain system.

Filter Liner

An impervious liner, such as 30 mil PVC, is recommended to line the sand filter. The liner will act to contain the filtrate and allow it to be collected by the underdrain system while also preventing infiltration. The liner should be watertight, defined as maintaining water for 24 hours with a loss of less than 1.6 mm. To ensure the selected liner is watertight, a 24-hour water balance test should be conducted after the underdrain system and media have been installed. It is also recommended to install a geotextile fabric liner in between the impervious liner and the underdrain media to prevent puncturing [2]. Pipe connections for the underdrain system must be fitted with a watertight boot. An alternative to an impervious liner is a watertight concrete tank [2].

Inspection Pipes

Inspection pipes allow operators to monitor the sand filter for ponding at different depths. Typical systems have inspection pipes made of 100 mm PVC pipe located at the following three depths:

- Just above the filter liner, with perforations that span the depth of the underdrain rock
- At the bottom of the filter media, with perforations that span 150-200 mm of the lower portion of the filter media
- At the top of the filter media, with perforations that run from the bottom of the distribution media up to the distribution network

Inspection pipes should be fitted with an elbow, tee, or cross at the bottom to secure the pipe and should be capped about the surface [2].

Distribution Media

The distribution media is typically composed of 200 mm of coarse drainfield rock and houses the distribution network in the middle of it. The distribution media helps to distribute wastewater evenly, provides some insulation to limit freezing, and allows air to reach the filter media.

Filter Media

The filter media of a sand filter serves two purposes – to provide a space for bacteria to live and to provide channels for waste to pass through. The bacteria exist on the surface of the media and within the voids located between individual grains. Typical media used for an RSF includes graded sand (1.0-5.0 mm diameter) and gravel. Crushed glass can also be used if it is available and has the benefit of being a recycled product. In all cases, the media should durable, rounded, washed, and fine particles passing the No. 200 sieve should be limited to less than 3%. Media that is too small or filled with fines will be susceptible to clogging and have limited space for bacteria. Lastly, the media should be uniform with a maximum uniformity coefficient of 4. Lower values indicate a more uniform media and are more desirable. A uniform media limits the chances of voids between media particles being filled by other smaller media particles, limiting clogging.

The media used can be selected based on availability and will be a primary factor in determining the recirculation ratio. Smaller media will have an increased retention time, meaning that waste passes through it more slowly. A greater retention time is desirable as it allows more time for bacteria to digest

waste as is passes through the media and will require a smaller recirculation ratio. As the size of media increases, retention time decreases and so more passes may be required to achieve the desired effluent quality – i.e. a higher recirculation ratio is needed. Furthermore, as media size increases, time to fouling increases, maintenance decreases, allowable hydraulic loading rate increases. Media life may be extended, and the field is less prone to freezing.

Underdrain Media

The underdrain media must be deep enough to cover the underdrain system and should be made of clean, hard, durable stone. It is recommended that underdrain media totals 305 mm of depth and is composed of 51 mm of 3/8" pea gravel followed by 254 mm of coarse media. The pea gravel is used to prevent the filter media from passing into the underdrain media.

Underdrain System

The underdrain system serves two purposes: to transfer filtrate to the flow splitter; and to provide a passage for air to enter the underdrain. To allow air to reach the underdrain, the upstream end of the underdrain should be directed upwards using two 45-degree bends and should terminate above the surface to allow access for cleaning. Typical underdrain systems are made of 100 mm PVC pipe slotted with 6 mm wide slots. It is important that the slots are large enough to allow free movement of water, but small enough to prevent underdrain media from entering the pipe. The bottom of the sand filter should be sloped at least one percent to the underdrain system. For sand filters with multiple zones, one underdrain system should be installed in each zone [2].

Example RSF Media Layering

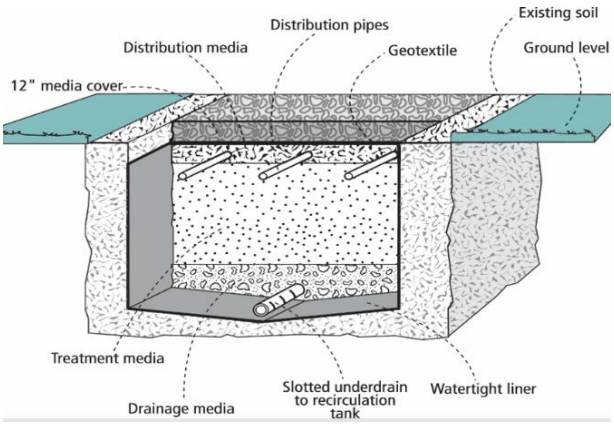


Figure 16 – Example of RSF Media Layering

An example of the multi-tiered media used in an RSF can be seen in Figure 12. The watertight liner can be seen spanning the bottom and sides of the RSF, acting to contain the filter and prevent infiltration. In this example, a geotextile fabric is placed above the distribution network to limit inflow. The distribution network can be seen within the coarse distribution media which allows for drainage and aeration. The treatment media makes up most of the sand filter, sitting below the distribution media and above a coarse drainage media. The coarse drainage media, pictured here as a single layer, allows the filtrate to pass freely towards the underdrain and back to the recirculation tank.

Appendix F – AdvanTex System Example Drawings

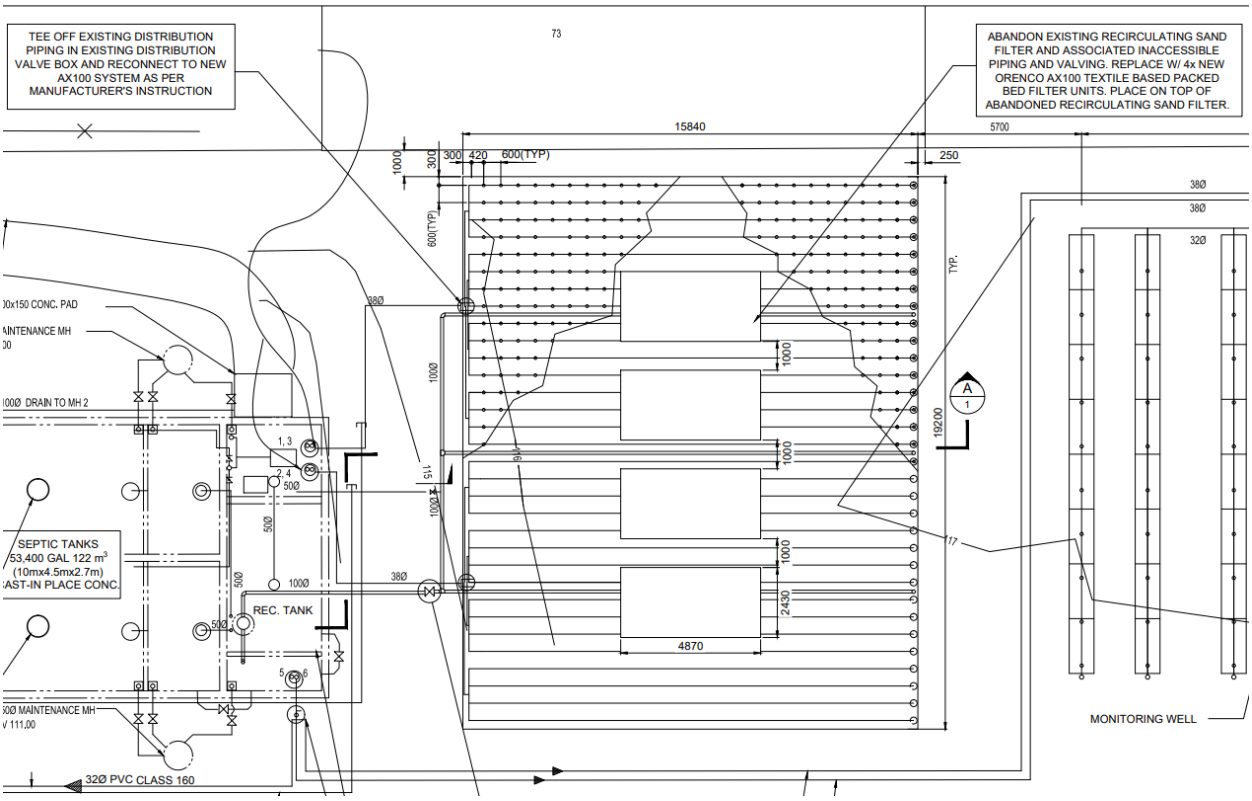


Figure 17 – AdvanTex System Example

Appendix G – Ecoflo Coco Filter Example

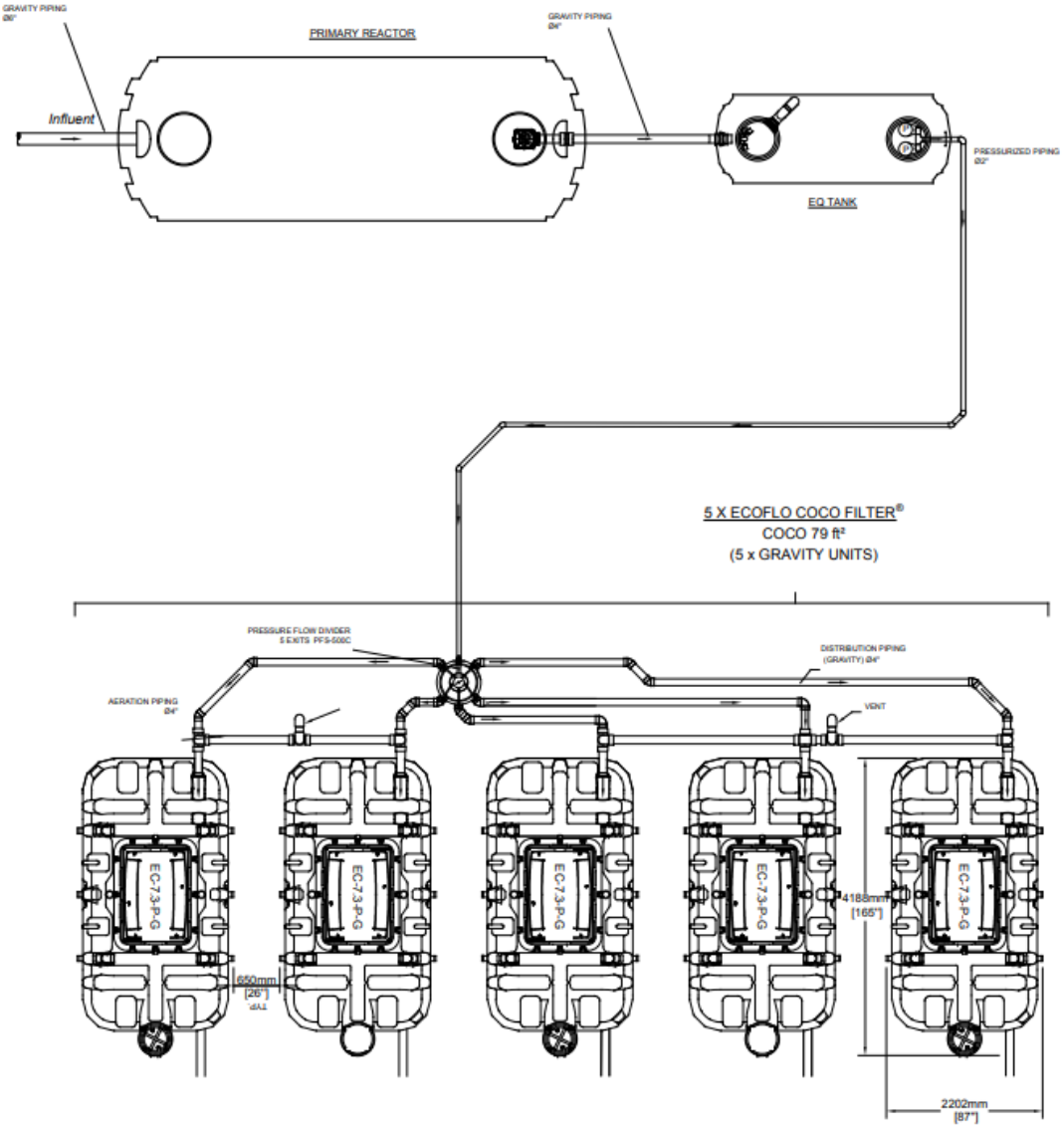


Figure 18 – Ecoflo Coco Filter System Example

Appendix H – Brentwood Industries Plastic Media Filter

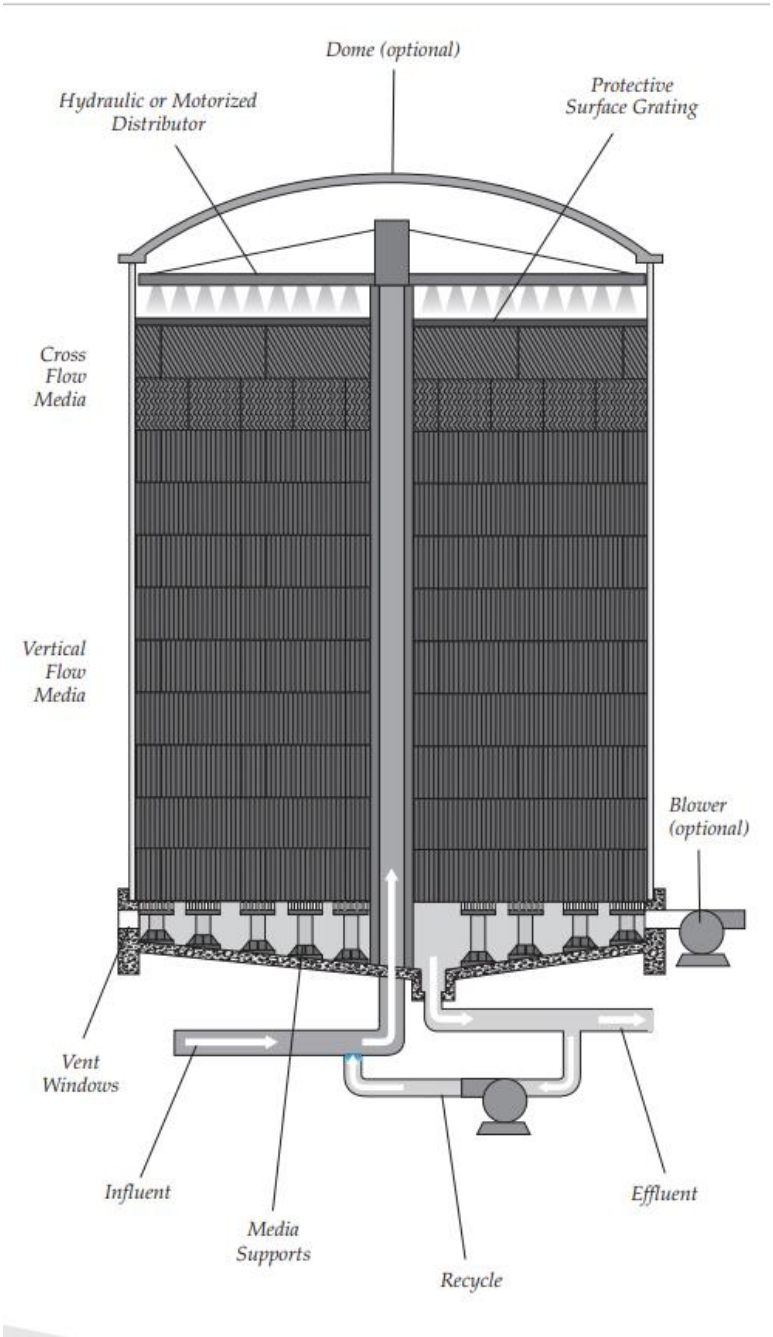
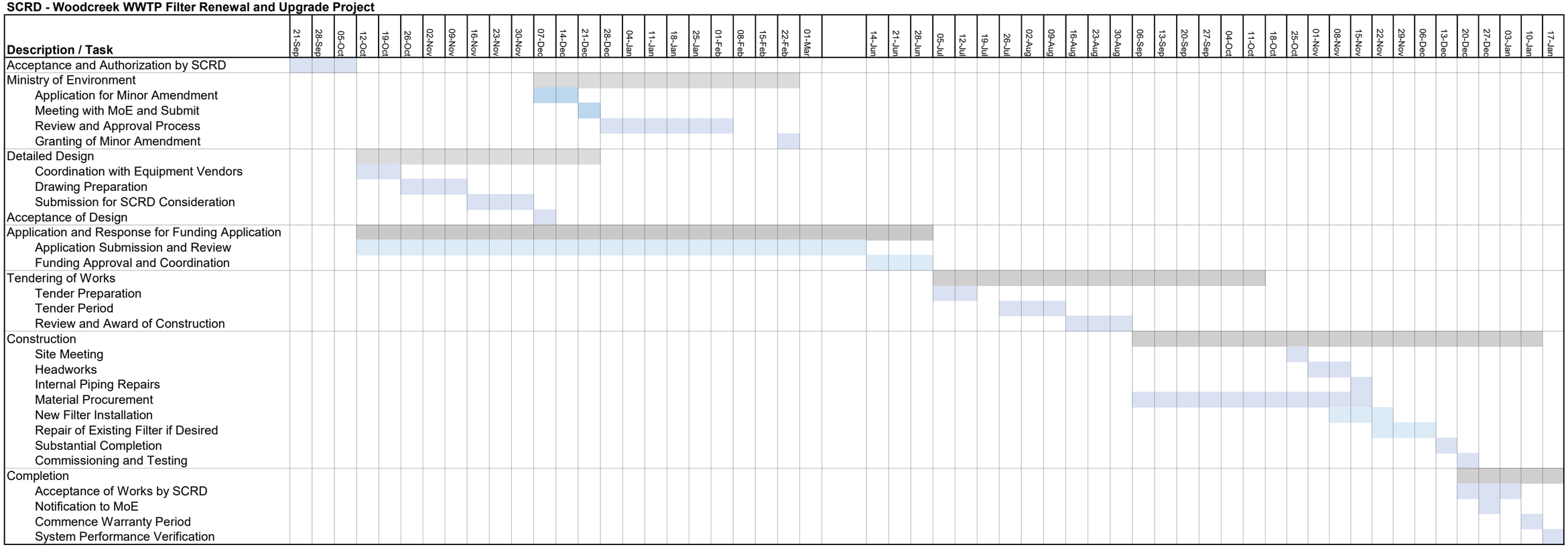


Figure 19 – Brentwood Industries Structured-sheet Plastic Media Tower

SCRD - Woodcreek WWTP Filter Renewal and Upgrade Project



SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Remko Rosenboom, General Manager, Infrastructure Services
Stephen Misiurak, Manager, Capital Projects

SUBJECT: Contract for Church Road Well Field Project - Update

RECOMMENDATION(S)

THAT the report titled Contract for Church Road Well Field Project - Update be received;

AND THAT the contract with Associated Environmental Consultants Inc. for the Groundwater Investigation - Phase 4A be increased by $75,000 to $812,182 (excluding GST);

AND THAT the delegated authorities be authorized to execute the contract;

AND FURTHER THAT should the water license for the Church Road well project not be issued, that the expenses to date be funded through operational reserves.

BACKGROUND

Currently the SCRD has a contract with Associated Environmental Consultants Inc. for engineering services for the Groundwater Investigation Phase 4A – Church Road Well Field project. Staff verbally updated the Board on the construction and commissioning timelines for the Church Road well field project at the November 6, 2020 Special Corporate and Administrative Services Committee meeting. This delay is due to ongoing work with respect to work to improve the province's understanding of the functioning of the aquifer, the Environmental Flow Needs (EFN) for Soames Creek and additional support to the province's consultation with the Squamish Nation.

The purpose of this report is to request an amendment to the contract with Associated Environmental Consultants Inc. to include the additional work required in support of our Water Licence application with the Ministry of Forests Land, Natural resource Operations and Rural Development (FLNRORD).

DISCUSSION

Additional support on Water Licence application

The Ministry of Forests Land, Natural resource Operations and Rural Development has been adjudicating our Water Licence application since fall 2019 and has recently requested additional support in the form of:

- Detailed technical analyses in support of our proposed EFN for Soames Creek. This type of analyses is over and above of the EFN-analysis usually required in support of a Water Licence.
- Detailed monitoring plan for the EFN in Soames Creek. Such a plan was scheduled for development post issuance of the Water licence.
- Additional technical analyses on the hydrotechnical functioning of the aquifer.
- Additional technical support to the Ministry's consultation process with the Squamish Nation.

Staff reviewed the current contract with Associated Environmental Consultants Inc. and concluded that these activities are within the scope of the current contract and that the available budget is insufficient to complete these activities.

Financial Implications

The additional support required to meet all Provincial regulatory requirements would require an additional effort by our contractor at an estimate cost of $50,000. Staff recommend to also increase the contract with $25,000 as a contingency allowance for currently unforeseen additional information request from FLNRORD. It's recommended to increase the value of the contract for this project with Associated Environmental Consultants Inc. by $75,000 from $737,182 to $812,182.

Given that the total approved budget for the entire development of this well field is $8,270,000, this contract increase does not require an increase to the project budget or the 2020-2024 Financial Plan.

If for any reason the water license is not issued and the construction does not proceed, the project, which is currently funded from capital reserves and long-term debt, would then need to be funded through user fees or operational reserves. As of the date of this report, $536,000 had been expensed and could reach to as high as $800,000. Therefore, any further reporting will provide a funding update and associated Financial Plan Bylaw amendments if required.

Timeline for next steps

Following Board adoption, staff will prepare an amended contract for signing by the delegate authorities.

Staff are hopeful by undertaking these activities a Water licence will be issued to the SCRD within the next several months.

STRATEGIC PLAN AND RELATED POLICIES

The Groundwater Investigation Project supports the SCRD Board's 2019-2023 Strategic Plan to plan for and ensure year round water availability now and in the future**.**

CONCLUSION

The purpose of this report is to seek approval to amend the SCRD's contract with Associated Environmental Consultants Inc. to allow for the ongoing support on our Water Licence with FLNRORD, specifically regarding the Environmental Flow Need assessment and monitoring on Soames Creek, the hydrogeological functioning of the aquifer and technical support with FLNRORD's consultation with the Squamish Nation.

The amended contract value would be $812,182 (excluding GST).

Reviewed by:			
Manager		CFO/Finance	X- T. Perreault
GM		Legislative	
CAO	X– D. McKinley	Purchasing & Risk Management	X- V. Cropp

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Service Committee – November 19, 2020

AUTHOR: Jen Callaghan, Water Sustainability Technician

SUBJECT: **DROUGHT RESPONSE PLAN 2020 SUMMARY**

RECOMMENDATION(S)

THAT the report titled Drought Response Plan 2020 Summary be received for information.

BACKGROUND

The purpose of this report is to update the Board on the application of the Drought Response Plan (DRP) in 2020.

The SCRD's DRP is the primary tool for minimizing impacts to water supplies caused by summer drought or unforeseen water shortage situations. The Plan prescribes water use restrictions leading up to, during, and following periods of drought, prioritizing water supply for human health, fire protection, and Environmental Flow Needs (EFN).

Water Conservation Regulations are in place from May 1 to September 30, each year, graduating from Stages 1 through 4 based on seasonal water supply conditions (Normal (1), Moderate (2), Acute (3), Severe (4)) and consumption trends.

DISCUSSION

Water Supply and Forecasts: Chapman Water System

Spring

The Sunshine Coast entered spring with average levels of snow pack in both the Chapman and Edwards snow courses. Snow melt began with the dry and warm conditions experienced in April.

Environment Canada's seasonal forecast predicted a likelihood of slightly warmer than normal temperatures for the start of summer, but provided no strong indication for precipitation trends. The SCRD predicted the summer water supply levels of the Chapman Water System to be driven by precipitation amounts from mid-June, onwards.

Summer

Precipitation amounts in June met historically normal levels (although, wetter than the average of the past 10 years). This rainfall allowed natural creek flows to support community water demand in June. Warm and dry conditions began mid-July and continued through August, triggering the escalation of DRP Stages.

Chaster Well contributed to the Chapman Water System from July 21 to August 28, 2020, supplying 5.6% of the total water supply during that period. Gray Creek was not utilized in 2020.

Fall

Two large rainfall events occurred in Chapman watershed, on August 20-21 and September 23-25, each delivering over 125 mm of rain in the upper watershed and, consequently, replenishing lake storage. These rain events supported community water demand during a warm and dry September and secured the water supply of the Chapman Water System for the remainder of the fall season.

The Environmental Flow Need of Chapman Creek (200 litres per second) was maintained throughout 2020.

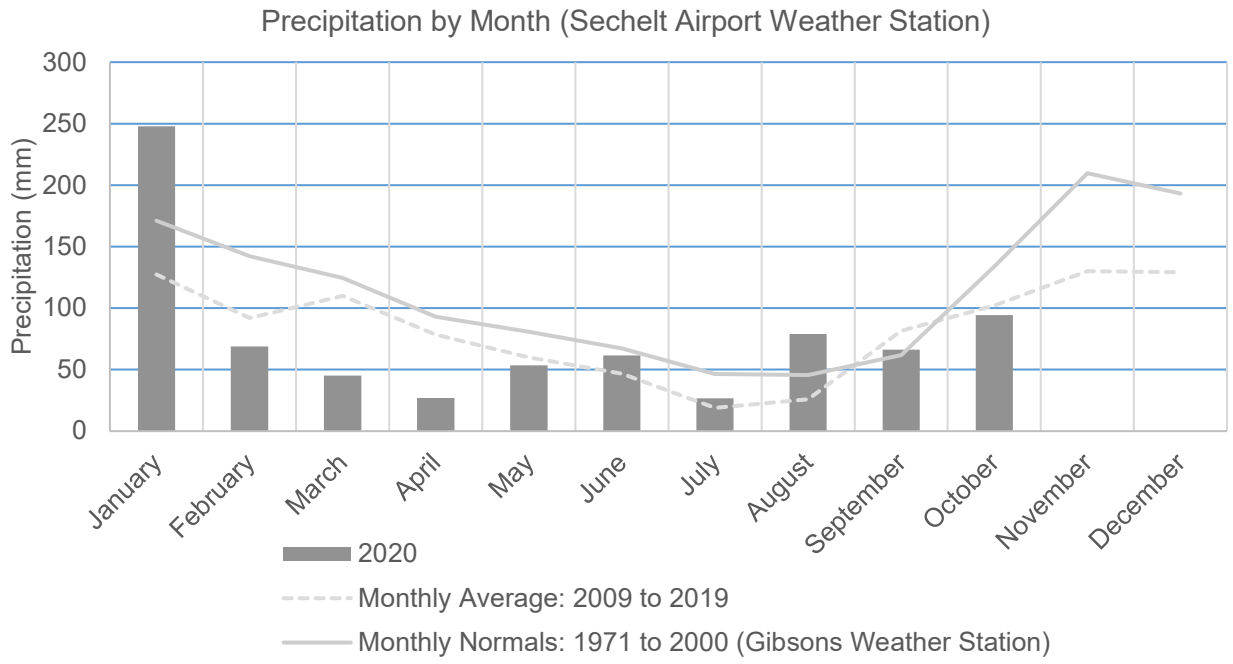


Figure 1. Monthly precipitation in 2020.

Water Consumption: Chapman Water System

Water consumption is influenced by indoor and outdoor water use habits as well as seasonal population fluctuation. Outdoor use of water is further influenced by weather patterns, like rainfall and average temperature. COVID-19 may have influenced water consumption in 2020, as well.

In 2020, seasonal increases in water demand began earlier than normal, in April. This is likely due to warm and dry weather conditions supporting outdoor water use activities like planting lawns, establishing gardens, and pressure washing. Additional seasonal occupancy or cleaning activities, related to COVID-19, may also be a consideration.

Small and regular rain events in May and June tempered outdoor water use and the total water demand. A drying trend in July, coupled with further increases in temperature, led to water consumption peaking at 20,495 cubic metres per day on July 27, 2020.

Town of Gibsons decoupled their "Zone 3" from the Chapman Water System on July 31, 2020. This resulted in a 6-7% reduction in water demand on the Chapman water supply.

Water storage from Chapman Lake continued to supplement natural flows in Chapman Creek, to meet both community water demand and Environmental Flow Need, until October 8, 2020.

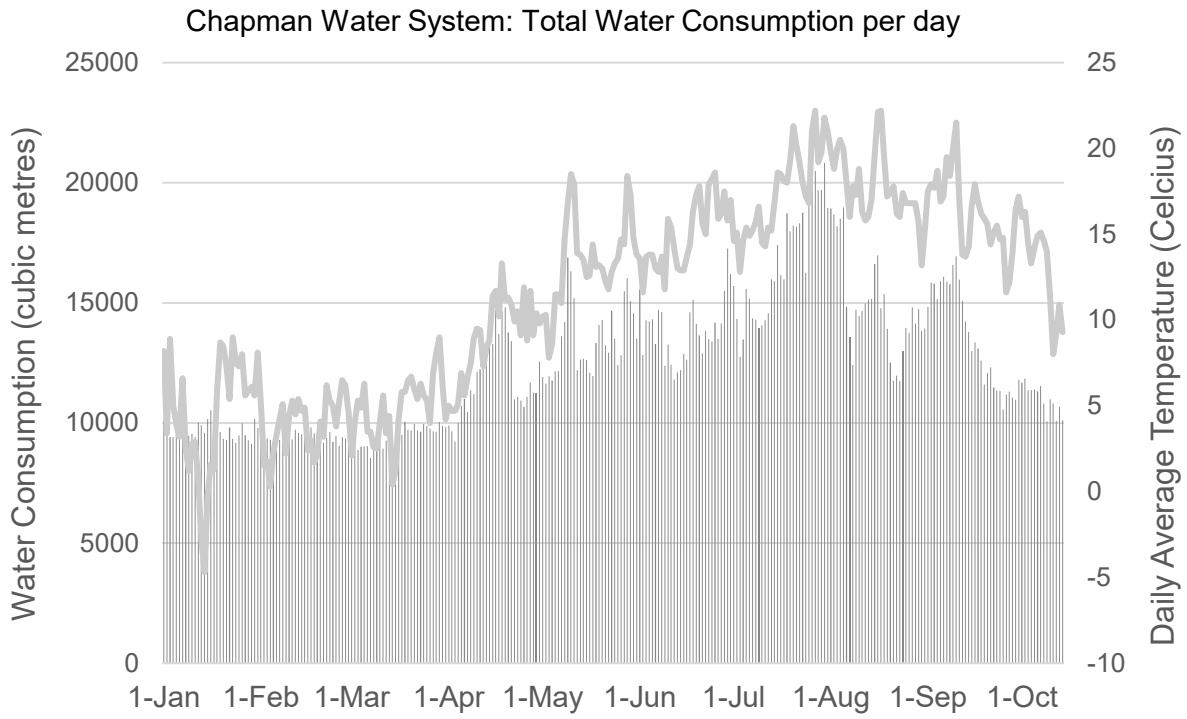


Figure 2. Daily Water Consumption of the Chapman Water System (Chapman Creek, Chaster Well and Gray Creek).

Use and Effectiveness of Water Conservation Regulations: Chapman Water System

The SCRD worked to proactively implement and escalate Stages again in 2020: to maintain operational confidence in water supply capacity for September and October, and to reduce the likelihood of implementing Stage 4 Water Conservation Regulations.

Stage 2 and 3 Water Conservation Regulations were in place for 38 days, in 2020, and Stage 4 Water Conservation Regulations were not implemented.

Summer rainfall events, public responsiveness to Water Conservation Regulations, the decoupling of Town of Gibsons Zone 3, and ongoing efforts in water conservation, allowed a return to Stage 1 regulations in August for the first time since 2011.

Table 1. Drought Response Plan: Percentage of Days in each Stage (May 1 to September 30)

Year	Stage 1	Stage 2	Stage 3	Stage 4
2018	52%	25%	14%	9%
2019	34%	26%	40%	0%
2020	71%	19%	10%	0%

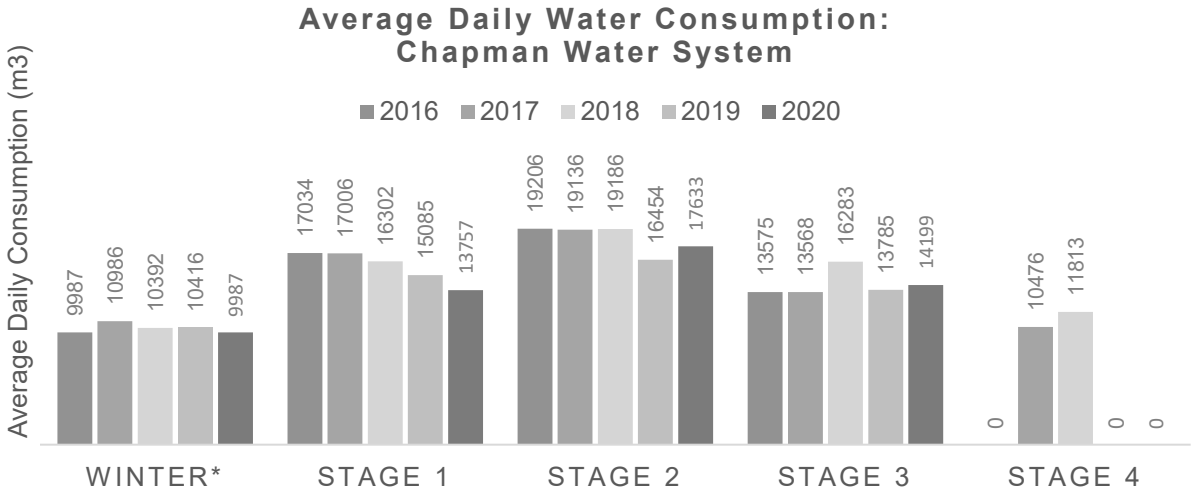


Figure 3. Average daily water consumption for each Stage (2016 to 2020).
**Winter baseline is November 1 to April 30.*

Water Conservation Regulations: All Water Systems

The Chapman Water System services 85% of SCRD water customers. The remaining SCRD water systems service smaller populations and experience less escalation in Water Conservation Regulations, with the exception of Eastbourne Water System.

Table 2. Drought Response Plan Stage Implementation: All Water Systems.

System	Source	Water Conservation Regulation in 2020
Langdale	Groundwater	Stage 1,2
Soames	Groundwater	Stage 1,2
Granthams	Groundwater	Stage 1,2
Chapman	Surface water: Chapman Creek, Chapman Lake, Edwards Lake Groundwater: Chaster Well	Stage 1, 2, 3
South Pender Harbour	Surface water: Haslam Creek, McNeill Lake	Stage 1
North Pender Harbour	Surface water: Garden Bay Lake	Stage 1
Cove Cay	Surface water: Ruby Lake	Stage 1
Egmont Cove	Surface water: Waugh Lake	Stage 1
Eastbourne	Groundwater	Stage 1, 2, 3, 4

Table 3. Drought Response Plan Stage Implementation Dates

Water System	Stage 1 (All)	Stage 2	Stage 3	Stage 4	Return to Stage 1
Chapman*	May 1	Jul 10	Aug 8	N/A	Aug 24
Eastbourne	May 1	May 21	Jul 10	Jul 23	N/A

** Langdale, Soames, and Granthams Water Systems also progressed to Stage 2 on July 10, 2020.*

Eastbourne Water System experiences Acute to Severe Water Supply Conditions during the dry summer months. The shallow groundwater system is reliant on precipitation for continuous replenishment. Each summer, the arrival of seasonal residents coincides with onset of dry weather and the water system cannot meet demand without the conservation efforts of residents.

During Stage 4, the water system is isolated into zones to maintain water pressure. Cistern filling operates on a rotation between zones. It can take many days to refill the water cistern at each property. Residents and visitors are asked to limit water consumption to the water available in each property's cistern.

A sign at Eastbourne wharf informs residents and visitors of the current Stage of Water Supply Conditions upon arrival. Changes to Stages are communicated through direct email for distribution to the Eastbourne Community Association and Island Trustee.

Lawn Watering Permits

Lawn watering permits were available for water customers to establish new lawns (seed or sod). Permits were only available during Stage 1 (Normal) Water Conservation Regulations and allowed watering from 7 am to 9 am and 7 pm to 9 pm for a period of 21 days, or until Stage 3 (Acute) was declared. In 2020, an electronic application form and payment option via mySCRD account were introduced to support permit applications by email or phone. The permit fee of $50.00 remained unchanged.

Table 4. Lawn watering permits by year

Year	Number of permits
2020	31
2019	54
2018	54

Communication

The SCRD utilized multiple channels of communication to share the Water Conservation Regulations with residents, businesses, and visitors.

- Direct communication with: Town of Gibsons, District of Sechelt, shíshálh Nation, SCRD Parks and Recreation, and property managers of commercial or multi-unit residential complexes.
- Weekly Water Updates posted on website and social media.
- Notification for each change between Stages:
    - Media releases
    - Website
    - Radio
    - Social Media
    - SCRD Office
    - Permanent Stage signs on highway in areas B, D and F
    - Sandwich boards at 8 high volume street intersections (Stage 3)
- Visitors provided with Water Conservation Regulations information through:
    - Poster campaign on BC Ferries during month of August
    - Signage on highways

SCRD staff supported public inquiries about Water Conservation Regulations by phone, email, and social media channels.

Compliance and Enforcement

The DRP and corresponding Water Conservation Regulations are dictated in Bylaw 422 and Bylaw 638.

In the enforcement of Bylaw 422, the SCRD has a compliance approach of: 1) Education; 2) Warning; 3) Fine. As per resolution 127/19 the fine for each infraction of Water Conservation Regulations remained in 2020 at:

Stage 1: $200	Stage 2: $300	Stage 3: $400	Stage 4: $500

SCRD staff interacted with 51 properties and issued 34 warnings related to their compliance with the Water Conservation Regulations. The majority of interactions were a result of staff patrol to ensure compliance with sprinkling hours. Properties in violation were left a door hanger notification with a warning citing the specific regulation. Select properties were mailed a violation notice or emailed directly. Complaints from the public were also followed up with the same process. Complaint volumes were significantly lower than previous years, totaling only 14 complaints in 2020.

A Bylaw Enforcement Notice (BEN) and the associated fine is issued in the case of ongoing violation, despite knowledge of Water Conservation Regulations. No fines were issued in 2020.

Table 5. Water Conservation Regulations compliance interactions by Water System

Water System	Number of Properties
Chapman	47
Granthams	0
Soames	0
Langdale	1
North Pender Harbour	2
South Pender Harbour	1
Egmont, Cove Cay	0
Eastbourne	0

Table 6. Reporting violations to Water Conservation Regulations

Activity Type	% Violations Reported
Patrol	73 %
Phone complaint	10 %
Email complaint	10 %
Bylaw Form submission (Website)	6 %
In person complaint (Administration Office)	2 %

Table 7. Category of Water Conservation Regulations violation reported.

Water Conservation Regulation Category	% Violations Reported
Lawns	71 %
Trees, Shrubs, Flowers	14 %
Washing Exterior Surfaces	10 %
Food Producing Plants	4 %
Filling pools, spas, ponds, fountains	2 %

Enforcement of Water Conservation Regulations is limited by staff capacity to patrol all areas of the SCRD, as well as limits created by time of day and line of sight to properties. As such, emphasis is also placed on education and incentive programming that supports compliance and a culture of conservative water use.

Supporting Education and Outreach

In the absence of in person public events, staff worked to share water system and usage information through two new initiatives.

Weekly Water Update

Ten Weekly Water Update presentations were released on YouTube between June 11 and August 27, 2020, generating over 900 views. The presentations aimed to provide information and support discussion about Water Conservation Regulations, as well as related topics like water meters and Church Road Well Field.

Monthly Water Use Update

A water use update was developed to share individual property water use information with participating residents. The monthly email update allows residents to compare:

- Water use during each month of the year
- Water use in 2019 with water use in 2020
- Total annual water use with water use per household across the Sunshine Coast

The program interacts with 135 subscribers each month. The update is available for property owners in Electoral Areas A, B, D, E, and F. Residents in the District of Sechelt are unable to participate at this time.

Regional summaries of residential water use trends were also shared in Water Supply Updates to the Infrastructure Services Committee and through subsequent social media posts.

Water Treatment Plant Tours

Staff will work to create a virtual tour option for 2021.

STRATEGIC PLAN AND RELATED POLICIES

Strategic Focus Area 2.1: Review and update Drought Response Plan to ensure alignment with water supply capacity.

Strategic Focus Area 1: To proactively engage with our residents, partners and staff in order to share information and obtain their input on issues and decisions that affect them.

CONCLUSION

The Drought Response Plan provides direction for the timely and responsive management of water supplies during times of supply challenges or seasonal drought.

The SCRD worked to proactively implement and escalate Stages again in 2020: to maintain operational confidence in water supply capacity for September and October, and to reduce the likelihood of implementing Stage 4 Water Conservation Regulations.

Based on the evaluation of the implementation of the Drought Response Plan in 2020, staff are not recommending any changes for 2021.

A full review of Bylaw 422 with a particular focus on updating the water conservation related provisions in that bylaw will be initiated in the spring of 2021.

Reviewed by:			
Manager	X- S. Walkey	Finance	
GM	X- R. Rosenboom	Legislative	
CAO	X- D. McKinley	Other	X - R. Shay

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **PRELIMINARY PARTICIPATION SUMMARY – GREEN BIN PROGRAM**

RECOMMENDATION(S)

THAT the report titled Preliminary Participation Summary – Green Bin Program be received;

BACKGROUND

Diversion of organics (food waste) has been identified as a priority to extend the lifespan of the Sechelt Landfill and to meet the targets in the SCRD's Solid Waste Management Plan (SWMP). As such, a Regional Organics Diversion Strategy (Strategy) was developed and subsequently adopted by the Board in January 2018.

An initiative in the SWMP and Strategy is the implementation of weekly collection for food waste and the reduction to collection for garbage to every-other-week.

The Sunshine Coast Regional District (SCRD) launched food waste and food soiled paper collection, the Green Bin Program, on October 6, 2020 for residences in SCRD Electoral Areas B, D, E and F that are within the service area. Concurrently, garbage collection was reduced to every-other-week.

The purpose of this report is to present the findings from a review of preliminary participation in the Green Bin Program.

DISCUSSION

Overview of Participation Summary Report

Staff tracked participation and contents of the Green Bin during the first two weeks of the Green Bin Program. This involved following the collection vehicles and noting which bin or bins were placed out for collection. As well, a random sampling of Green Bins had the lids lifted to view the contents and types of contamination were noted.

Additionally, at the compost facility, staff observed the loads of food waste material delivered during the first week of the Green Bin program.

In conjunction with tracking participation and contents, staff reviewed tonnage data for the first five weeks of collection for food waste and three weeks of collection for garbage (every-other week service, encompassing the same five week period.)

The results are detailed in the attached Preliminary Green Bin Program Participation Results Summary Report (Attachment A to this report) and can be summarized as follows:

- Observed participation was between 56% and 64% in week 1 and between 81% and 82% in week 2.
- Total food waste collected ranged from 9.69 tonnes in week 1 to 14.68 tonnes in week 5, which was noted as the week with the highest food waste collected.
- Overall, 61.54 tonnes of food waste has been collected over five weeks of collection.
- Preliminary tonnage data for garbage indicates a reduction of over 40% during weeks 3 and 5 (which contained two weeks' worth of garbage) when compared to weekly garbage tonnage data prior to implementation of the Green Bin program.
- Contamination was considered to be low both at curbside and the compost facility. Top contaminants included plastic bags of all types and recyclables.
- Complaints received about the Green Bin Program include:
    - Serious concerns over every-other-week garbage collection
    - Desire to utilize compostable plastic bags
    - Wildlife accessing Green Bins (during first two weeks)
    - Opt-out requests

A summary of participation by collection area comparing week one to week two is provided in Figure 1.

Figure 2 illustrates the curbside collection tonnages for both food waste and garbage for all collection areas combined.

Figure 1 – SCRD Green Bin Program Observed Participation

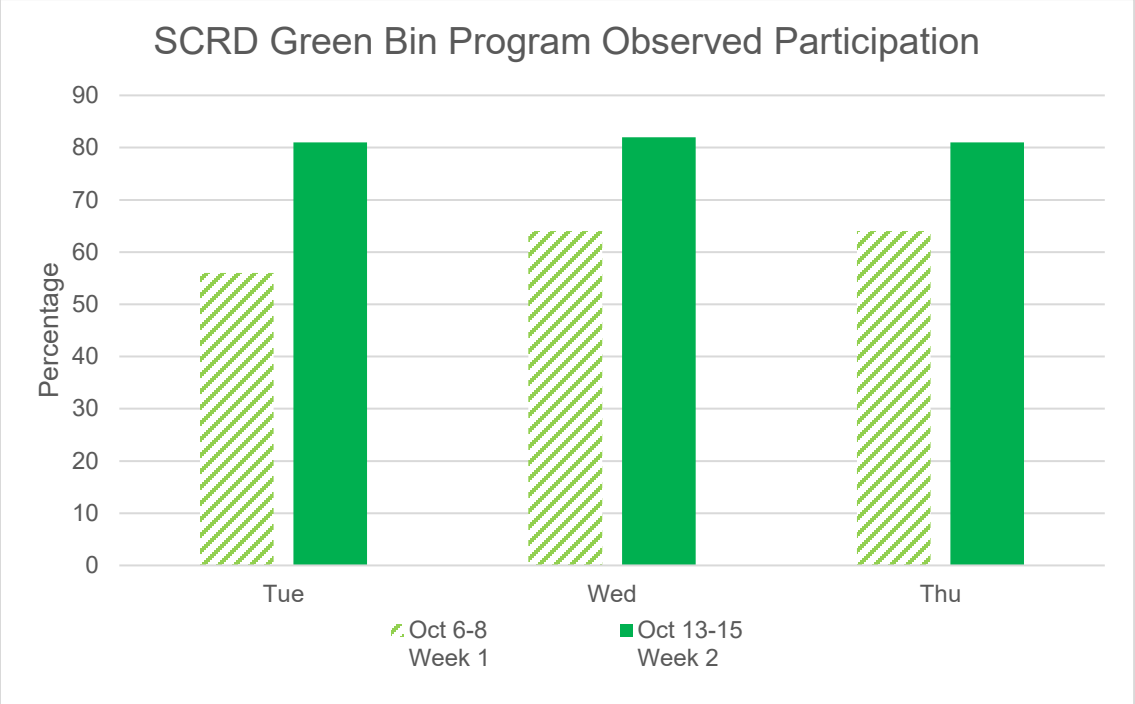
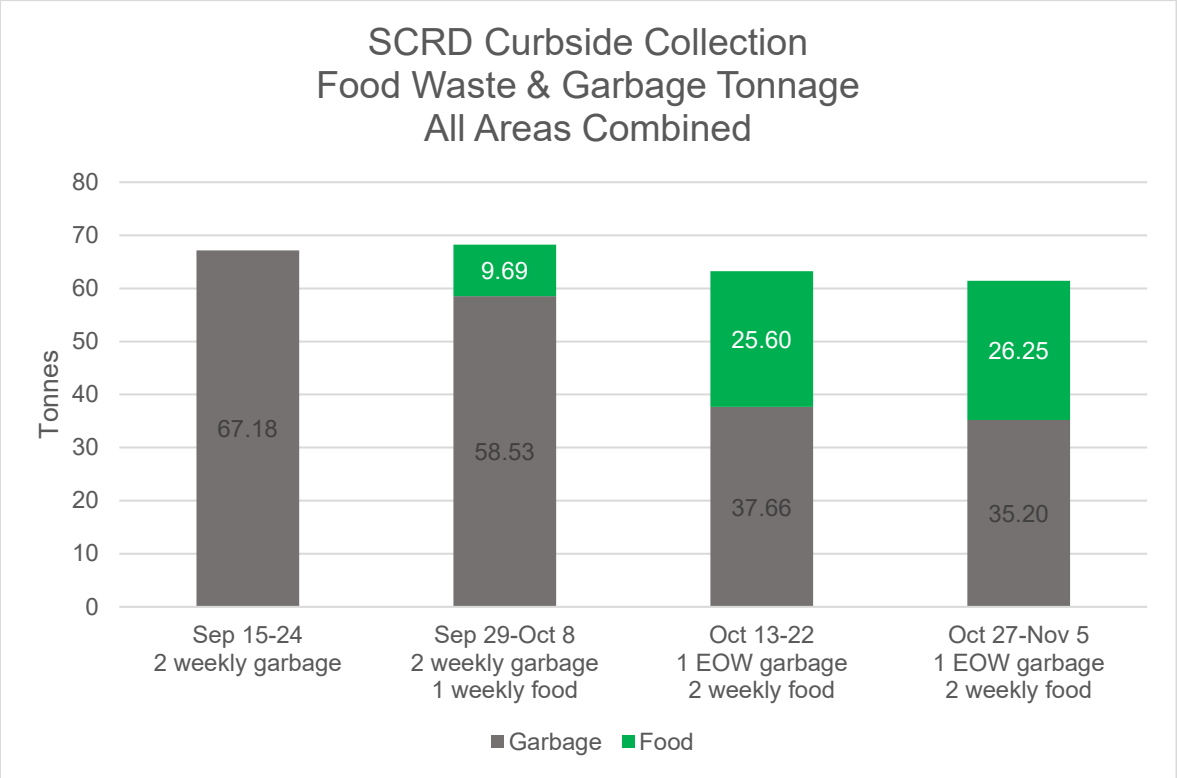


Figure 2 – SCRD Curbside Collection Tonnages Food Waste & Garbage All Areas Combined (note EOW = every-other-week)



Regional Organics Diversion Strategy

From the Strategy, it was anticipated that approximately 2,301 tonnes of food waste could be diverted annually through curbside collection, food waste drop-off for Electoral Area A residents and commercial food waste drop-off supported by a landfill disposal ban for both commercial and residential food waste. Table 1 summarizes the estimated annual food waste diversion by sector. The Strategy applied a recovery rate of 52 kilograms per capita for curbside and 10 kilograms per capita for drop-off from the residential sector and 30 kilograms per capita from the commercial sector.

If all of these initiatives were implemented in 2019, an estimated fifteen month extension of Sechelt Landfill capacity was estimated. As reported in Q1 2020, as of December 31, 2019, the estimated remaining Sechelt Landfill life was considered to be just over 6 years. This number will be updated in Q1 2021 and will consider the effects of the implemented food waste diversion programs.

Table 1 - Estimated Annual Food Waste Diversion

Sector	Estimated Annual Food Waste Diversion (Tonnes)
District of Sechelt curbside collection	470
Town of Gibsons curbside collection	225
Sechelt Indian Government District	33
SCRD Electoral Areas curbside collection	650
SCRD Electoral Area A residential drop-off	25
Commercial	899
Total	**2,301**

For the Town of Gibsons, 2019 was the first full year of food waste collection and resulted in 185 tonnes of food waste collected, 40 tonnes lower than the estimate.

For the District of Sechelt, the 500 home pilot in Davis Bay had 183 tonnes of food waste collected in 2019. The program is set to launch District-wide in 2021.

For the SCRD to achieve the estimated 650 tonnes per year, this would result in requiring a weekly average of 12.5 tonnes. Thus far, the SCRD has collected a total of 61.54 tonnes of food waste over five weeks of collection which is an average of 12.31 per week, just shy of the estimate.

Timeline for next steps

Staff will present additional findings from the food waste and garbage collection programs as part of the Infrastructure Services quarterly reporting and the annual regional diversion report that is presented in Q2 each year.

Staff are planning to conduct curbside participation audits for one-week intervals (during a week of Green Bin and garbage collection) three times per year for the next two years in spring, summer and fall.

Communications Strategy

Staff continue to implement the Communications Plan that was developed for the Green Bin Program and have incorporated the feedback received and observations about contamination into the plan.

STRATEGIC PLAN AND RELATED POLICIES

Food waste collection is one of the SCRD's SWMP's reduction initiatives to meet the plan's target of 65%-69% diversion and is a key initiative of the SCRD's Regional Organics Diversion Strategy.

Implementing the Strategy, including curbside collection services, is one of the tactics identified in the SCRD's Strategic Plan's Asset Stewardship strategic focus area.

CONCLUSION

The SCRD launched the Green Bin Program, a curbside collection program for food waste and food soiled paper on October 6, 2020 for residences in SCRD Electoral Areas B, D, E and F that are within the service area. Concurrently, garbage collection was reduced to every-other-week.

Staff tracked participation and contents of the Green Bin during the first two weeks of the program. The loads of food waste delivered to the compost facility during the first week were also observed.

As part of the participation summary, the first five weeks of tonnage data for both food waste and garbage were reviewed and were found to be aligned with anticipated tonnages for this service.

Overall, participation is high and contamination is low. The summary report is attached.

This report is being provided for the Board's information.

Attachments:

Attachment A – Preliminary Green Bin Program Participation Results Summary Report

Reviewed by:			
Manager		Finance	
GM	X-R.Rosenboom	Legislative	
CAO	X-D. McKinley	Other	

Sunshine Coast Regional District

Food Waste Curbside Collection Program (Green Bin)
Preliminary Participation Summary Report

October 30, 2020

Solid Waste Services

Sunshine Coast Regional District

SUNSHINE COAST REGIONAL DISTRICT

PRELIMINARY PARTICIPATION SUMMARY REPORT

Food Waste Curbside Collection Program Participation Summary
Sunshine Coast, British Columbia

Preliminary Participation Summary Report

This report serves as a summary of participation in the Sunshine Coast Regional District's (SCRD) launch of curbside collection of food waste, the Green Bin Program. The Green Bin Program collects food waste and food soiled paper and is one of the initiatives of the SCRD's Solid Waste Management Plan and Regional Organics Diversion Strategy.

About the Green Bin Program

The Green Bin Program collects food waste from residential homes within SCRD Electoral Areas B, D, E and F through weekly curbside waste collection services. It was launched in the fall of 2020 with the first collection occurring on Tuesday, October 6, 2020. As well, garbage collection was reduced to every-other-week with collection occurring the week of Green Bin Program launch, then every-other-week thereafter.

The SCRD provided each residence with a 45 litre Green Bin with a 'starter kit" which included a collection guide with calendar, a sticker that illustrated what is collected and one package of paper compostable bags (provided in-kind by Bag to Earth.)

Food waste accepted for collection includes all uneaten food and plate scrapings, cooked and uncooked food, dairy products, bread and pastries, meat and bones, fish, tea and coffee grounds, fruits and vegetables, and food soiled paper. Examples of what the program does not accept includes liquids, pet waste, yard or garden green waste or plastics including compostable or biodegradable.

Structure of the Report

- Summary of Results
- Overview of Participation Tracking
    - Data Collection Methods
    - Number of Participants
    - Contamination Observations
    - Contractor Feedback
    - General Observations
- Tonnage Summary
- Program Feedback
- Supporting Documents
    - Appendix 1: Local Weekly Advertisement
    - Appendix 2: Coast Reporter Bulletin Board Advertisements
    - Appendix 3: Green Bin sticker
    - Appendix 4: Mail out

- Appendix 5: Curbside Collection Guide – Single Family
- Appendix 6: Curbside Collection Guide – Multi-Family
- Appendix 7: Examples of Social Media Posts

Summary of Results

Over the first five weeks of the Green Bin program, 61.54 tonnes of food waste was collected for composting. Participation in the Green Bin program was observed to be approximately 56%-64% in the first week and 81%-82% in the second week. There has been a corresponding reduction in garbage tonnage since the Green Bin program was implemented and garbage collection was reduced to every-other-week.

Overview of Participation Tracking

Dates and Collection Methods

The SCRD started Green Bin collection on October 6, 2020. Participation was tracked for October 6, 7, 8, 13, 14, and 15 in the area receiving collection for that day. The first three days of service, October 6, 7 and 8, consisted of both Green Bin and Garbage collection. The following week, October 13, 14, and 15, was collection of the Green Bin only.

Tuesday collection includes properties north of the Sunshine Coast Hwy in Roberts Creek and Elphinstone, and West Howe Sound.

Wednesday collection includes properties in Halfmoon Bay.

Thursday collection includes properties south of the Sunshine Coast Hwy in Roberts Creek and Elphinstone.

The method of tracking participation consisted of observers following the contractor's collection routes for each day recording on a tracking sheet the number of homes that had placed Green Bin and Garbage out, Only Green Bin out, Only Garbage out or no bins out. Tracking was performed by SCRD staff, the Sunshine Coast WildSafeBC Coordinator and one volunteer from the SCRD's Solid Waste Management Plan Monitoring Advisory Committee (PMAC).

For identifying contents of the Green Bin, observers wore gloves and utilized sanitizer and at random, lifted the lids of Green Bins.

At the compost facility, SCRD staff observed the loads of food waste material collected curbside and delivered on October 6, 7 and 8.

Number of Participants

The following tables summarize participation observed over two weeks of collection based on collection day.

Overall, participation was observed to be between 56% and 64% in week 1 and between 81% and 82% in week 2.

In week 2 it was observed that of the Total participation 19% of residents placed garbage cans out for collection.

Table 1 summarizes the number of bins placed out for collection based on bin types. Total Participation includes Green Bin & Garbage, Green Bin only and Garbage only. Total Checked includes Total Participation and No Bins placed out for collection.

Table 2 compares the total number of Green Bins out for collection to Total Participation.

Figure 1 illustrates the observed participation over the two weeks by collection day.

Limitations for data collection include the following: Observers were only able to account for bins that were visible and where there was an address and driveway visible. It was also not possible to account for secondary dwellings that do not have a visible address or suites. Thus, from the September 30, 2020 house count of 5,856, during week 1 a total of 4,736 household were checked, and 3,439 were checked during week 2.

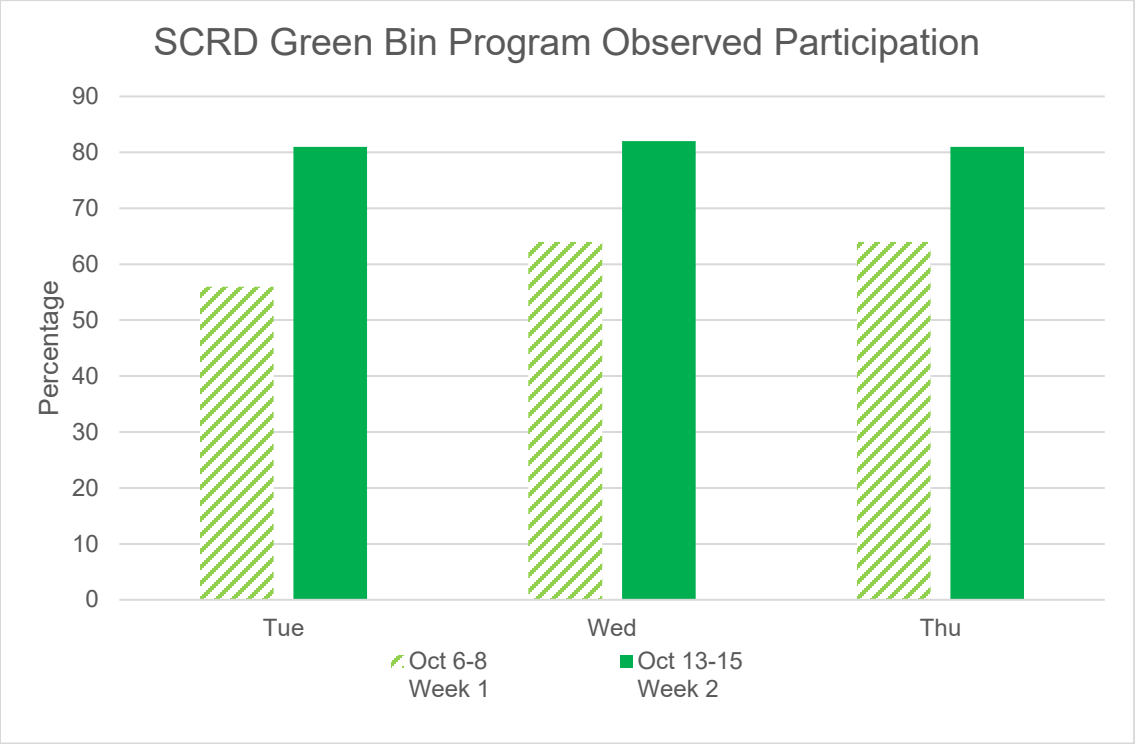
Table 1 - Number of Households Observed with Bins out for Collection

Date	Green Bin & Garbage	Green Bin only	Garbage only	Total Participation	No Bins	Total Checked
Week One – Green Bin & Garbage						
October 6, 2020	361	72	347	780	543	1323
October 7, 2020	418	77	274	769	374	1143
October 8, 2020	950	169	633	1752	518	2270
Total	**1,729**	**318**	**1,254**	**3,301**	**1,435**	**4,736**
Week Two – Green Bin only						
October 13, 2020	39	332	85	456	294	750
October 14, 2020	35	588	140	763	415	1178
October 15, 2020	130	619	179	928	583	1511
Total	**204**	**1,539**	**404**	**2,147**	**1,292**	**3,439**

Table 2 - Number of Households Observed with Green Bins out for Collection

Date	Total Participation	Total Green Bins	% Participation
Week One – Green Bin & Garbage			
October 6, 2020	780	433	56
October 7, 2020	769	495	64
October 8, 2020	1,752	1119	64
Total/Average	**3,301**	**2,047**	**62**
Week Two – Green Bin & Garbage			
October 13, 2020	456	371	81
October 14, 2020	763	623	82
October 15, 2020	928	749	81
Total/Average	**2,147**	**1,743**	**81**

Figure 1 – SCRD Green Bin Program Observed Participation



Green Bin Contents Observations

On each day and each route for the first two weeks of Green Bin collection, the observers randomly lifted lids, observing contents and recorded instances of contamination. Overall, despite being observed in all areas, the total number of instances where contamination was seen was low. It was not observed if one particular area had more or less contamination than another.

The most common source of contamination observed were plastics such as bags. These included what appeared to be a range of types from recyclable, compostable and biodegradable plastic bags. Figure 2 and Figure 3 are photos taken showing Green Bins containing plastic bags that appeared to be compostable.

Figure 2 – Compostable Plastic Bags in Green Bin

Figure 3 – Compostable Plastic Bags in Green Bin

The second most common source of contamination observed were recyclables such as coffee cups, ice cream containers, Styrofoam or plastic containers. Some Green Bins were seen to hold only recyclables (with no food waste) or food waste was mixed with recyclables. Examples are shown in Figures 4 and 5.

Figure 4 – Recyclables in Green Bin

Figure 5 – Recyclables in Green Bin

Composting Facility Observations

The food waste delivered over the three days of October 6, 7 and 8, 2020 was observed by staff from the SCRD, compost facility and curbside collection service provider. Observers considered all the loads to be very clean. Minimal contamination was visible and included items such as produce stickers, a couple of plastic bags (packaged food) and some compostable plastic bags.

Other observations included that there was a lot of wasted food in each load such as an entire uncooked turkey, a full, unpackaged, 10lb bag of potatoes and many whole zucchinis and other whole vegetables.

Curbside Collection Contractor Feedback

The contracted curbside collection service provider provided the following weekly summaries.

For the first week of service, October 6-8, 2020:

- Every route saw a large number Green Bins with compostable bags.
- 5% to 10% of the Green Bins had recycling materials in them. E.g. cardboard, cereal boxes, magazines.
- One route saw a few Green Bins with pet waste in them (oops stickers were placed on these Green Bins identifying the issue and were not collected.)

For the second week of service, October 13-15, 2020:

- Higher participation than week 1 (estimated 90%), with a higher than expected percentage of garbage placed out for collection (estimated 50%).
- Approximately 5% are placing recyclables in the Green Bin.
- High percentage of Green Bins are utilizing compostable plastic bags, extra information was provided.

For the third week of service, October 20-22, 2020:

- Observing an estimated 80%-90% participation.
- Quite a few Green Bins with compostable plastic bags, extra information was provided.
- Garbage collection was heavier than week one (this was expected as this was first collection of two weeks' worth of garbage and followed Thanksgiving.)
- Approximately 40% of garbage placed curbside included the use of extra garbage tags.

Tonnage Summary

The following table and figures provide summaries of the tonnages for materials collected curbside.

Table 3 summarizes the tonnages by week for garbage and food waste collected curbside.

Figure 6 shows the weekly food waste tonnages over the first five weeks of collection.

Figure 7 displays the tonnages for garbage collected over an eight week period; three weeks prior to food waste collection, the week of food waste collection and two every-other-week garbage collections

Each collection area is shown as a different colour for each week. For consideration when reviewing the table and figures, the total number of households in each collection area varies, with Thursday having the highest number of households and requires three trucks for collection as opposed to two trucks on Tuesdays and two trucks on Wednesdays.

Thus far, the SCRD is collecting between 9.6 tonnes and 14.68 tonnes of food waste per week with week five having the highest tonnage to date. However, week five followed Halloween which may have influenced the tonnage data due to the probable collection of pumpkins.

Figure 8 compares the total tonnage for curbside collection from September 15, 2020 to November 5, 2020. This period encompasses two every-other-week garbage collections and five weekly Green Bin collections.

After implementing every-other-week garbage collection, there was a total of 72.86 tonnes of garbage collected over two collections (4 week period). This resulted in an average of 18.22 tonnes of garbage per week compared to 29.27 tonnes and 33.59 tonnes average garbage per week over the four previous weeks.

Table 3 – Weekly Tonnages for Curbside Collection

Type of Collection	Sep 15-17	Sep 22-24	Sep 29-Oct 1	Oct 6-8	Oct 13-15	Oct 20-22	Oct 27-29	Nov 3-5
	Tonnage							
Garbage	33.89	33.29	33.09	25.44	n/a	37.66	n/a	35.2
Food Waste	n/a	n/a	n/a	9.69	13.22	12.38	11.57	14.68

Figure 6 – SCRD Curbside Collection Food Waste Tonnage

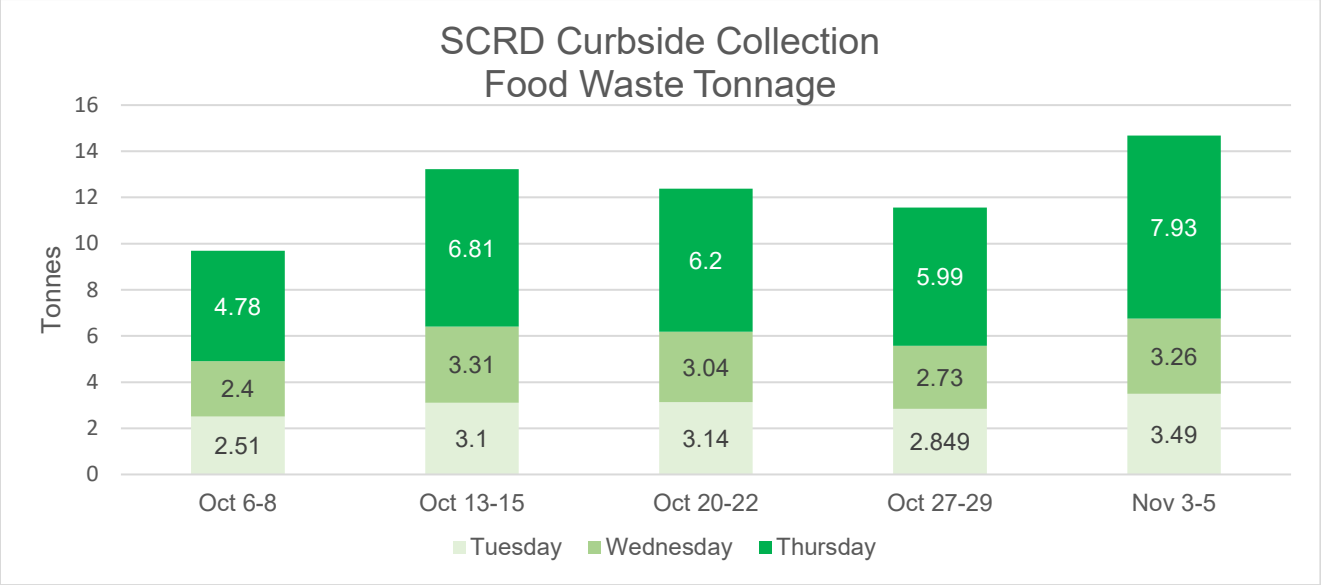


Figure 7 – SCRD Curbside Collection Garbage Tonnage

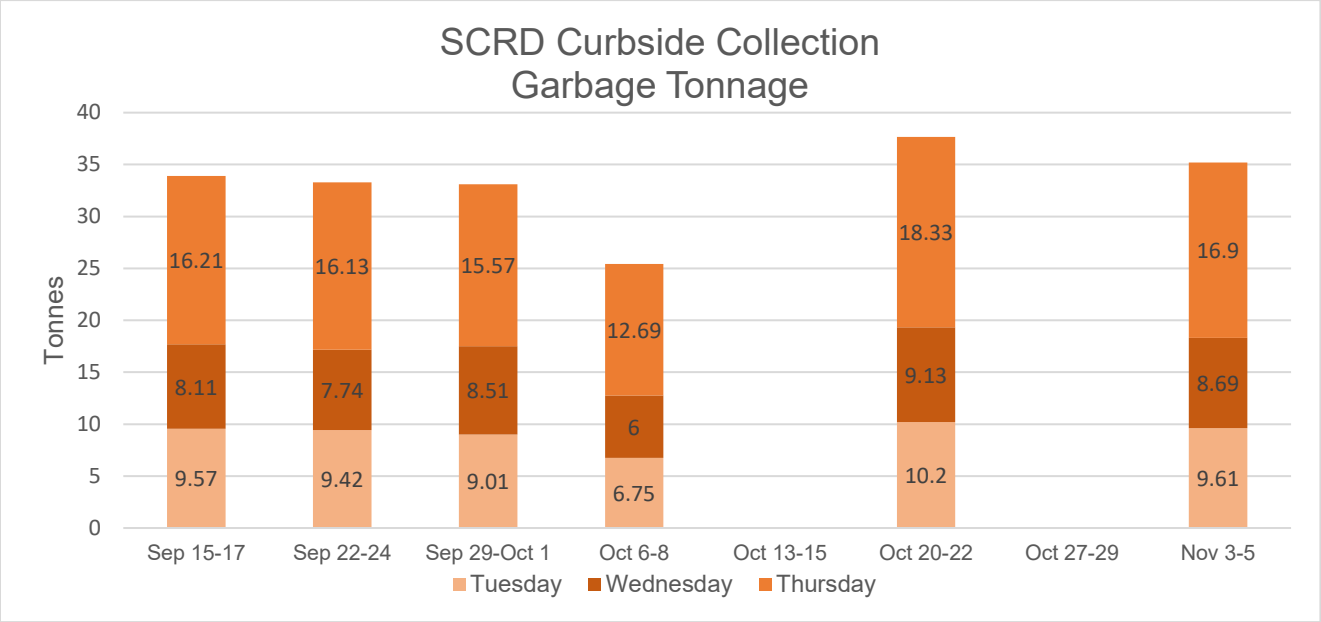
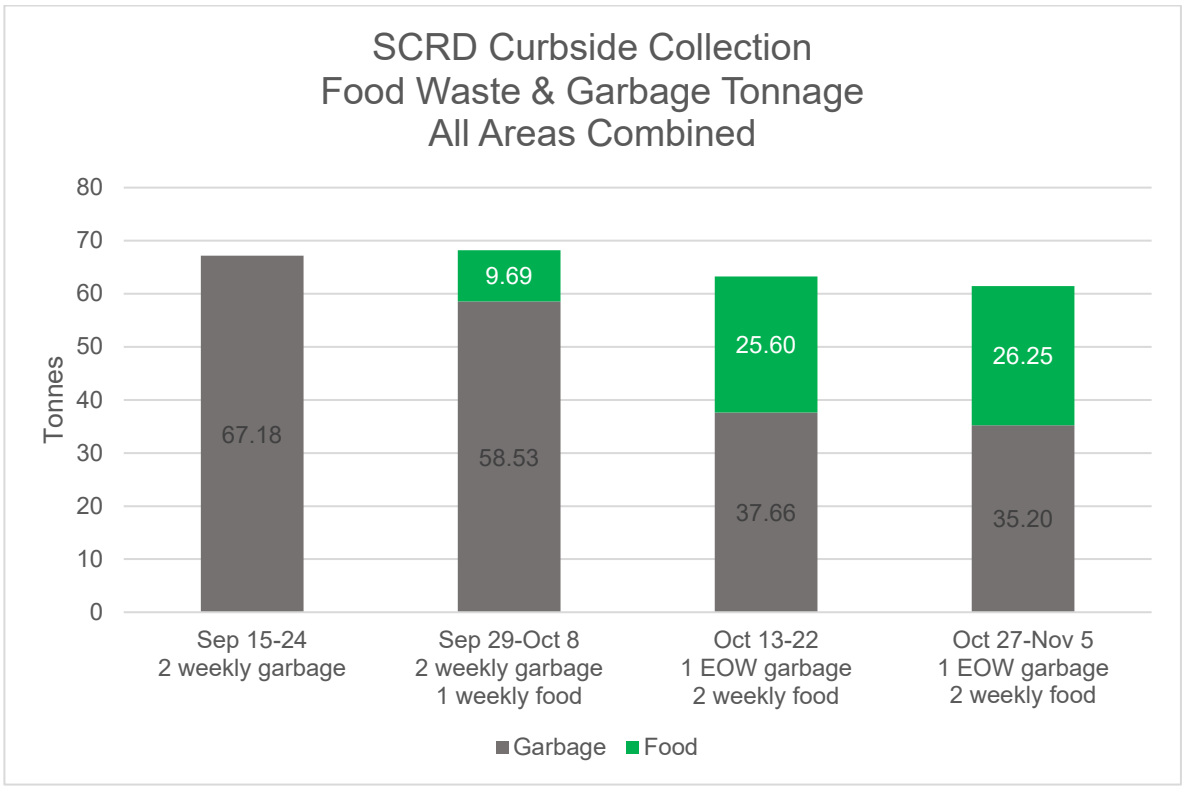


Figure 8 – SCRD Curbside Collection Tonnages Food Waste & Garbage All Areas Combined



Program Feedback
SCRD staff are continuing to track program feedback from residents and consistently through the first month of the Green Bin program residents continue to bring the following to staff's attention:

- Inquiries about program changes, specifically looking for clarification of the schedule
- Preference to use certified compostable plastic bags; requesting a change to the program to allow them
- What is accepted in the Green Bin
- Opting out of the Green Bin
- Positive feedback about the program
- Alternate container use because the container is too large for their needs
- Wildlife accessing the Green Bin (during first two weeks)
- Serious concerns with every-other-week garbage
    - Concerns regarding the bin being too large or difficult to maneuver with two weeks of garbage for those with mobility issues.
    - Families with diapers (children or adult) concerned about weight and volume of waste.
    - Families with cats having kitty litter, thus the weight is a concern.
- Interest in curbside recycling

Supporting Documents

The following supporting documents are attached to this report:

Appendix 1: Local Weekly Advertisement

Appendix 2: Coast Report Advertisement

Appendix 3: Green Bin sticker

Appendix 4: Mail-Out Brochure

Appendix 5: Curbside Collection Guide – Single Family

Appendix 6: Curbside Collection Guide – Multi-Family

Appendix 7: Examples of Social Media Posts

Local Weekly Advertisement

Green Bin Program

Your new food waste curbside collection service.

This fall, the Sunshine Coast Regional District (SCRD) will be introducing a new weekly food waste curbside collection service. We will provide home owners with curbside collection containers ("Green Bin") and instructions on how to use them.

All you will need to do is empty any food waste you have, such as plate scrapings, peelings, coffee grounds and paper towels into a kitchen container of your choice and then empty into your new Green Bin and put the Green Bin out for collection on your collection day. To keep your bin clean, wrap food waste in newspaper or use paper bags. The moisture in the food waste will be absorbed by the paper, helping to eliminate odours.

Start of the service

The new service will begin the first full week of October with the first collection day on October 6. Food waste will be collected every week.Your garbage will be collected with your Green Bin the first week of service, then it will be collected every other week.

What we will provide

Items will be delivered approximately two weeks prior to the start of the service. Please look inside the Green Bin for the materials. If you don't receive a Green Bin by September 30, 2020, please contact the SCRD at: infrastructure@scrd.ca or 604-885-6806.

A 45 litre food Green Bin which we will empty weekly


Starter kit: paper kitchen container bags (optional use)

Find your collection schedule with the SCRD Collects App and sign up for reminders and service notifications!

www.scrd.ca/curbside-food

What can go in the Green Bin?

food waste
- All uneaten food and plate scrapings

dairy
- Dairy products
- Cheese
- Eggs/Shells

bread and pastries
- Bread
- Cakes
- Pastries

meat and bones
- Raw meat
- Cooked meat
- Bones

tea & coffee grounds
- Paper tea bags, tea leaves
- Coffee grounds
- Coffee filters

fruit and vegetables
- Raw vegetables
- Cooked vegetables
- Whole fruit
- Peelings

good to know

You can also include cut flowers, flower bunches and house plant cuttings.

fish
- Fish
- Cooked fish
- Bones
- Soft shells from lobster, crab or shrimp

rice, pasta and beans
- Rice
- Pasta
- Beans

food soiled paper
- Paper towels, plates, napkins
- Food soiled cardboard, newspaper

For more information: www.scrd.ca/curbside-food

SUNSHINE COAST REGIONAL DISTRICT

Coast Reporter Advertisements

Green Bin Program

Your new food waste curbside collection service.

Beginning October 6, the Sunshine Coast Regional District will be implementing a weekly curbside food waste collection service for the residences in the service areas receiving garbage collection. Your collection day remains the same.

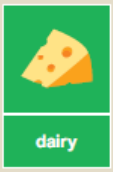
Coinciding with the curbside food waste collection service will be a transition from weekly to every-other-week garbage collection. Garbage will be collected the first week of food waste service.

A 45-litre food waste bin ("Green Bin") along with a curbside collection guide, a starter kit of paper kitchen container bags and a "what's in" sticker will be provided to residences between September 14 and 30. The materials will be placed inside the Green Bin or delivered to a central contact for multi-family dwellings.

What can you put in your Green Bin?

food waste

- All uneaten food and plate scrapings

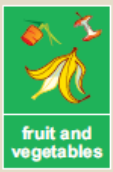


dairy

- Dairy products
- Cheese
- Eggs/ Shells

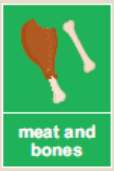
tea & coffee grounds

- Paper tea bags, tea leaves
- Coffee grounds
- Coffee filters



fruit and vegetables

- Raw vegetables
- Cooked vegetables
- Whole fruit
- Peelings

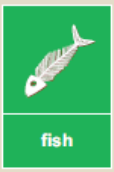


meat and bones

- Raw meat
- Cooked meat
- Bones

bread and pastries

- Bread
- Cakes
- Pastries



fish

- Fish
- Cooked fish
- Bones
- Soft shells from lobster, crab or shrimp

food soiled paper

- Paper towels, plates, napkins
- Food soiled cardboard, newspaper

For more information:
www.scrd.ca/curbside-food

SUNSHINE COAST REGIONAL DISTRICT

Green Bin Program

Frequently Asked Questions

Who can participate in the food waste curbside collection program?

Starting Fall 2020, all residences within the Sunshine Coast Regional District (SCRD) service area receiving garbage collection will participate in the food waste curbside collection program.

Is participation in the food waste curbside collection program mandatory?

Yes. Under the SCRD's refuse collection bylaw the separation of food waste from garbage is required by all residences in the service area.

What if I backyard compost?

Please continue to use your home composter! If you have food items such as meat or bones or food soiled papers that you are not currently backyard composting, then place these in your Green Bin.

What can I use to collect food waste in my kitchen?

Any container will do! Collect food waste and food soiled paper waste in a kitchen container of your choice before emptying it into your Green Bin. "Kitchen catchers" are available at many local retailers and online. Find one that suits your fancy!

What about wildlife?

Just like your garbage can, clean your Green Bin regularly and keep indoors until the morning of your collection day and take it indoors after pick up as soon as possible. For other tips, visit www.scrd.ca/curbside-food and www.wildsafebc.com/live.

For more information:
www.scrd.ca/curbside-food

SUNSHINE COAST REGIONAL DISTRICT


No amount is
TOO
SMALL
good to know
start by
placing your
TEABAGS and
COFFEE
grounds
in your
GREEN
BIN
To find out what else goes
in your Green Bin visit:
www.scrd.ca/curbside-food
SUNSHINE COAST
REGIONAL DISTRICT

Green Bin Sticker

Green Bin — What's In

food waste

- All uneaten food and plate scrapings

dairy

- Dairy products
- Cheese
- Eggs/ Shells

bread and pastries

- Bread
- Cakes
- Pastries

meat and bones

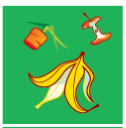
- Raw meat
- Cooked meat
- Bones

good to know

You can also include cut flowers, flower bunches and house plant cuttings.

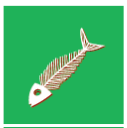
tea & coffee grounds

- Paper tea bags, tea leaves
- Coffee grounds
- Coffee filters



fruit and vegetables

- Raw vegetables
- Cooked vegetables
- Whole fruit
- Peelings



fish

- Fish
- Cooked fish
- Bones
- Soft shells from lobster, crab or shrimp

food soiled paper

- Paper towels, plates, napkins
- Food soiled cardboard, newspaper

- ✕ Garbage
- ✕ Liquids of any kind
- ✕ Dryer lint, vacuum contents, hair, pet waste
- ✕ Elastics, staples, twist ties or produce stickers
- ✕ Plastics of any kind, including compostable or biodegradable
- ✕ Hard shells from clams or oysters
- ✕ Yard or garden green waste

SUNSHINE COAST REGIONAL DISTRICT

www.scrd.ca/curbside-food

Mail Out Curbside Brochure

Frequently Asked Questions

Who can participate in the food waste curbside collection program?

Starting Fall 2020, all residences within the SCRD service area receiving garbage collection will participate in the food waste curbside collection program.

Is participation in the food waste curbside collection program mandatory?

Yes. Under the SCRD's refuse collection bylaw the separation of food waste from garbage is required by all residences in the service area.

What if I backyard compost?

Please continue to use your home composter! If you have food items or food soiled papers that you are not currently backyard composting, then place these in your Green Bin.

What can I use to collect food waste in my kitchen?

Any container will do! Collect food waste and food soiled paper waste in a kitchen container of your choice before emptying it into your Green Bin. "Kitchen catchers" are available at many local retailers and online. Find one that suits your fancy!

What about wildlife?

Just like your garbage can, clean your Green Bin regularly and keep indoors until the morning of your collection day and take it indoors after pick up as soon as possible. For other tips, visit www.scrd.ca/curbside-food and www.wildsafebc.com/live.

For more Frequently Asked Questions:
www.scrd.ca/curbside-food

Green Bin Program

Your new food waste curbside collection service.

Starting Fall 2020!
Find out more inside

For more information:
www.scrd.ca/curbside-food

SUNSHINE COAST REGIONAL DISTRICT

Green Bin Program:
your new food waste curbside collection service

This fall, the Sunshine Coast Regional District (SCRD) will be introducing a new weekly food waste curbside collection service. We will provide home owners with curbside collection containers ("Green Bin") and instructions on how to use them.

All you will need to do is empty any food waste you have, such as plate scrapings, peelings, coffee grounds and paper towels into a kitchen container of your choice and then empty into your new Green Bin and put the Green Bin out for collection on your collection day. To keep your bin clean, wrap food waste in newspaper or use paper bags. The moisture in the food waste will be absorbed by the paper, helping to eliminate odours.

Start of the service

The new service will begin the first full week of October with the first collection day on October 6. Food waste will be collected every week. Your garbage will be collected with your Green Bin the first week of service, then it will be collected every other week.

What we will provide

Items will be delivered approximately two weeks prior to the start of the service. Please look inside the Green Bin for the materials.

A 45 litre food Green Bin which we will empty weekly

Starter kit: paper kitchen container bags (optional use)

Find your collection schedule with the SCRD Collects App and sign up for reminders and service notifications!

www.scrd.ca/curbside-food

On your collection day, please put your Green Bin out by 8:00 a.m.

If you don't receive a Green Bin by September 30, 2020, please contact the SCRD at: infrastructure@scrd.ca or 604-885-6806.

good to know

By using your Green Bin you will help cut down the amount of food waste that ends up in our landfill. Food waste that is sent to the landfill takes up valuable space. While it rots in the landfill, it releases methane gas — a harmful greenhouse gas. Food waste collected from the Green Bin program wil be processed locally by Salish Soils into compost, a beneficial resource.

What can go in the Green Bin?

food waste
- All uneaten food and plate scrapings

dairy
- Dairy products
- Cheese
- Eggs/Shells

bread and pastries
- Bread
- Cakes
- Pastries

meat and bones
- Raw meat
- Cooked meat
- Bones

tea & coffee grounds
- Paper tea bags, tea leaves
- Coffee grounds
- Coffee filters

fruit and vegetables
- Raw vegetables
- Cooked vegetables
- Whole fruit
- Peelings

fish
- Fish
- Cooked fish
- Bones
- Soft shells from lobster, crab or shrimp

rice, pasta and beans
- Rice
- Pasta
- Beans

food soiled paper
- Paper towels, plates, napkins
- Food soiled cardboard, newspaper

You can also include cut flowers, flower bunches and house plant cuttings.

good to know

Please do not put any of these materials in your Green Bin:

- Garbage
- Liquids of any kind
- Dryer lint, vacuum contents, hair, pet waste
- Elastics, staples, twist ties or produce stickers
- Plastics of any kind, including compostable or biodegradable
- Hard shells from clams or oysters
- Yard or garden green waste

Appendix 5

Curbside Collection Guide Single Family

Reduce, Reuse, Recycle

Waste Reduction Tips

good to know

- Choose products that have minimal or no packaging.
- Pick reusable instead of disposable.
- Donate items for reuse or purchase used: **www.scrd.ca/reuse-directory**.
- Borrow from a friend or neighbour.
- Recycle or compost as much as you can before disposing as garbage.
- Visit **www.scrd.ca/holiday-recycling** for reduction and recycling tips for seasonal celebrations year round.

Green Waste Recycling

Green waste can be composted in your backyard or taken to one of the SCRD drop-off locations. For location information and what's accepted, visit **www.scrd.ca/composting**. Did you know? Dumping green waste in our forests or beside the road is illegal—dumping can harm our waterways, spread invasive species, and attract wildlife.

Home Composting

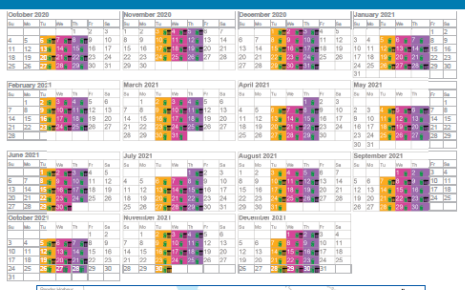
Get started or brush up on home composting at **www.scrd.ca/composting** for tips on keeping your compost productive and safe from wildlife. Home composting helps your garden and the environment. For the materials you are not backyard composting, use your Green Bin.

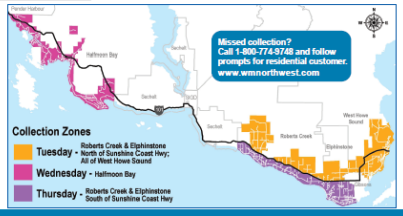
Residential Recycling

The SCRD provides recycling through Recycle BC's residential recycling program at three depots on the Sunshine Coast. For location information and what's accepted visit **www.scrd.ca/recycling-depots**.

www.scrd.ca/solid-waste

2020-2021 Curbside Collection Calendar





Get updates with the SCRD Collects App: www.scrd.ca/curbside-food

Curbside Collection 2020-2021 GUIDE

Get updates with the SCRD Collects App: www.scrd.ca/curbside-food

Green Bin — WEEKLY

How to set it out

Place your Green Bin at your curb on your collection day by 8:00 a.m.

Keep the lid closed and lock engaged.

Bring your bin inside after collection as soon as possible.

Green Bin

- Collected weekly
- Limit: 1 Green Bin per household
- Maximum weight: 20kg (44lbs)
- Place accepted materials loose in the Green Bin or in paper bags placed inside the Green Bin
- Keep your bin clean by wrapping food waste in newspaper or using paper bags. The moisture in the food waste will be absorbed by the paper, helping to eliminate odours.

Coexisting with Wildlife

Help keep wildlife wild, and communities safe. Just like your garbage can, keep your Green Bin indoors until the morning of collection day.

- Keep Green Bin locked when at the curb so wildlife do not access bins and become habituated in the community.
- Clean your Green Bin (and garbage can) regularly.
- Find more information: **www.wildsafebc.com/live**

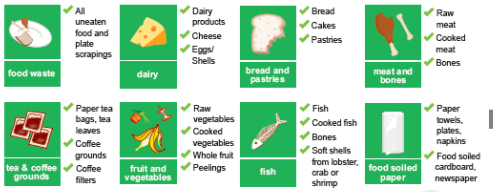
good to know

By using your Green Bin you will help cut down the amount of food waste that ends up in our landfill. Food waste that is sent to the landfill takes up valuable space. While it rots in the landfill, it releases methane gas — a harmful greenhouse gas. Food waste collected from the Green Bin program will be processed locally by Salish Soils into compost, a beneficial resource.

www.scrd.ca/curbside-food

Green Bin — WEEKLY

What's In



What's Out

- Garbage
- Liquids of any kind
- Dryer lint, vacuum contents, hair, pet waste
- Elastics, staples, twist ties or produce stickers
- Plastics of any kind, including compostable or biodegradable
- Hard shells from clams or oysters
- Yard or garden green waste

good to know

You can also include cut flowers, flower bunches and house plant cuttings.

Reducing Food Waste

Did you know that wasted food costs an average Canadian household over $1,100 per year? Check out **www.scrd.ca/reduce-food-waste** for how these three mottos can help you at home!

PLAN IT OUT — USE IT UP — KEEP IT FRESH

www.scrd.ca/curbside-food

Garbage — BI-WEEKLY

How to set it out

Place your Garbage Can at your curb on your collection day by 8:00 a.m.

Keep the lid on.

Bring your can inside after collection as soon as possible.

Garbage

- Collected bi-weekly (every other week)
- Limit: 1 Garbage Can per household
- Maximum weight: 20kg (44lbs)
- Place accepted material in a sealed bag and place inside garbage can
- Extra garbage tags can be purchased from:
  Sunshine Coast Regional District, 1975 Field Road, Sechelt
  Gibsons Home Hardware, 921 Gibsons Way, Gibsons

What's In

- Garbage generated by residential premises from typical household use
- Municipal solid waste (garbage) of a non-toxic nature
- Garbage capable of being contained in a garbage can

What's Out

- Yard and garden green waste, branches, logs
- Land clearing waste
- Construction/demolition waste such as wood, scrap metal or gypsum
- Liquids of any kind
- Commercial, industrial, institutional waste
- Hot or burning material
- Hazardous, explosive, chemical waste
- Waste oil, petroleum by-products
- Paint, batteries of any kind

What can be recycled?
www.scrd.ca/recycling-directory

www.scrd.ca/curbside-garbage

Appendix 6

Curbside Collection Guide Multi-Family

Reduce, Reuse, Recycle

Waste Reduction Tips

good to know

- Choose products that have minimal or no packaging.
- Pick reusable instead of disposable.
- Donate items for reuse or purchase used: **www.scrd.ca/reuse-directory**.
- Borrow from a friend or neighbour.
- Recycle or compost as much as you can before disposing as garbage.
- Visit **www.scrd.ca/holiday-recycling** for reduction and recycling tips for seasonal celebrations year round.

Green Waste Recycling

Green waste can be composted in your backyard or taken to one of the SCRD drop-off locations. For location information and what's accepted, visit **www.scrd.ca/composting**. Did you know? Dumping green waste in our forests or beside the road is illegal—dumping can harm our waterways, spread invasive species, and attract wildlife.

Home Composting

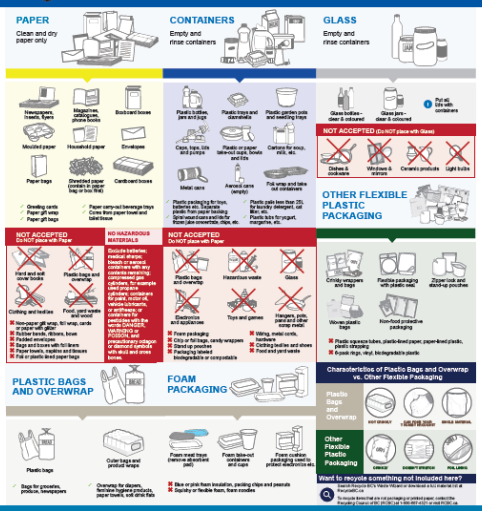
Get started or brush up on home composting at **www.scrd.ca/composting** for tips on keeping your compost productive and safe from wildlife. Home composting helps your garden and the environment. For the materials you are not backyard composting, use your Green Bin.

Residential Recycling

The SCRD provides recycling through Recycle BC's residential recycling program at three depots on the Sunshine Coast. For an overview of what is accepted see the next page of this brochure. For more information and depot locations visit **www.scrd.ca/recycling-depots**.

www.scrd.ca/solid-waste

Depot Recycling



www.scrd.ca/recycling-depots

Multi-Family Curbside Collection 2020-2021 GUIDE

Get updates with the SCRD Collects App: www.scrd.ca/curbside-food

Green Bin — WEEKLY

How to set it out

Have bin available for service at designated pick up location on your collection day by 8:00 a.m.

Secure bin after collection as soon as possible.

Keep the lids closed.

Green Bin

- Collected weekly.
- One Green Bin per Strata.
- Place accepted materials loose in the Green Bin or in paper bags placed inside the Green Bin. Contractor will replace the bin liner after each service.
- Keep your bin clean by wrapping food waste in newspaper or using paper bags. The moisture in the food waste will be absorbed by the paper, helping to eliminate odours.
- Should your Green Bin require maintenance, please contact the Contractor.

Coexisting with Wildlife

Help keep wildlife wild, and communities safe.

- Keep your Green Bin and Garbage Bin secured at all times so wildlife do not access bins and become habituated in the community.
- Keep your Green Bin and Garbage Bin clean.
- Find more information: **www.wildsafebc.com/live**

good to know

By using your Green Bin you will help cut down the amount of food waste that ends up in our landfill. Food waste that is sent to the landfill takes up valuable space. While it rots in the landfill, it releases methane gas — a harmful greenhouse gas. Food waste collected from the Green Bin program will be processed locally by Salish Soils into compost, a beneficial resource.

www.scrd.ca/curbside-food

Green Bin — WEEKLY

What's In

- food waste: All uneaten food and plate scrapings
- dairy: Dairy products, Cheese, Eggs/ Shells
- bread and pastries: Bread, Cakes, Pastries
- meat and bones: Raw meat, Cooked meat, Bones
- tea & coffee grounds: Paper tea bags, tea leaves, Coffee grounds, Coffee filters
- fruit and vegetables: Raw vegetables, Cooked vegetables, Whole fruit, Peelings
- fish: Fish, Cooked fish, Bones, Soft shells from lobster, crab or shrimp
- food soiled paper: Paper towels, plates, napkins, Food soiled cardboard, newspaper

What's Out

- Garbage
- Liquids of any kind
- Dryer lint, vacuum contents, hair, pet waste
- Elastics, staples, twist ties or produce stickers
- Plastics of any kind, including compostable or biodegradable
- Hard shells from clams or oysters
- Yard or garden green waste

good to know

You can also include cut flowers, flower bunches and house plant cuttings.

Reducing Food Waste

Did you know that wasted food costs an average Canadian household over $1,100 per year? Check out **www.scrd.ca/reduce-food-waste** for how these three mottos can help you at home!

PLAN IT OUT — USE IT UP — KEEP IT FRESH

www.scrd.ca/curbside-food

Garbage — WEEKLY

How to set it out

Have bin available for service at designated pick up location on your collection day by 8:00 a.m.

Secure bin after collection as soon as possible.

Keep the lids closed.

Garbage

- Collected weekly.
- One Garbage Bin per Strata.
- Place accepted materials in securely sealed bags and place into the bin.
- Should your bin require maintenance, please contact the Contractor.

What's In

- Garbage generated by residential premises from typical household use
- Municipal solid waste (garbage) of a non-toxic nature
- Garbage capable of being contained in a garbage can

What's Out

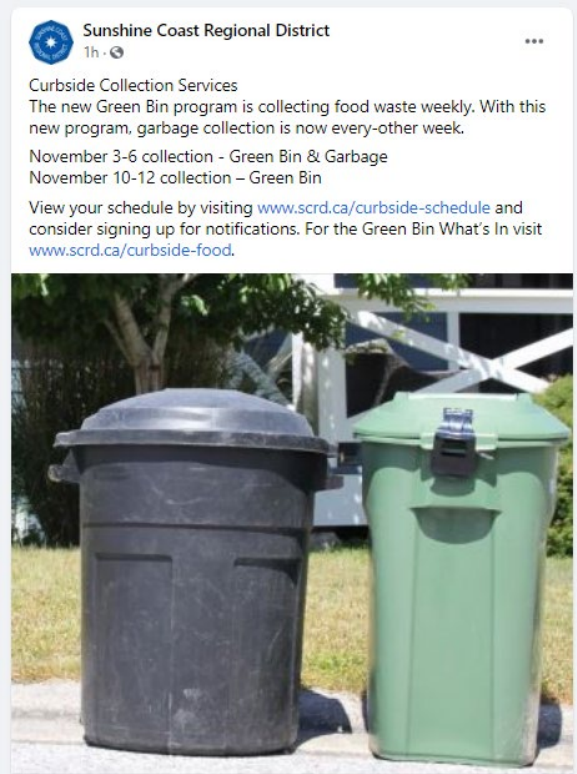
- Yard and garden green waste, branches, logs
- Land clearing waste
- Construction/demolition waste such as wood, scrap metal or gypsum
- Liquids of any kind
- Commercial, industrial, institutional waste
- Hot or burning material
- Hazardous, explosive, chemical waste
- Waste oil, petroleum by-products
- Paint, batteries of any kind

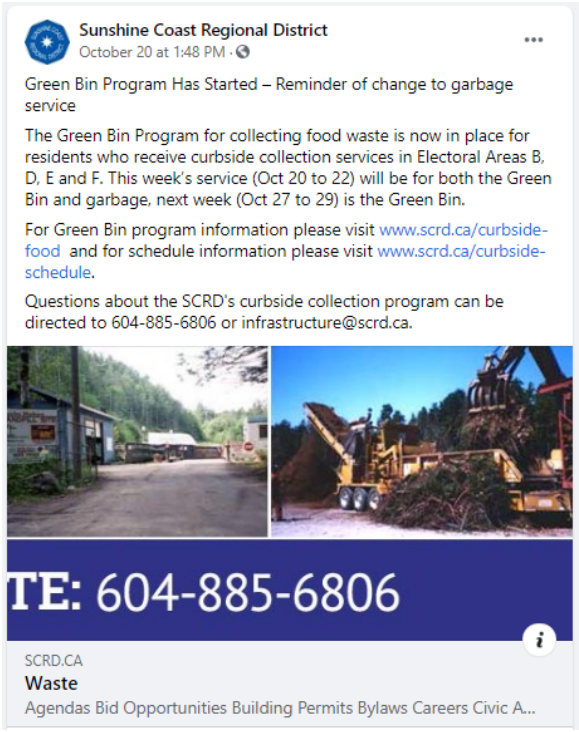
What can be recycled? www.scrd.ca/recycling-directory

www.scrd.ca/curbside-garbage

Appendix 7

Examples of Social Media Posts





=SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **TIPPING FEE REVIEW OF MATERIALS RECEIVED FOR DIVERSION AT SCRD FACILITIES**

RECOMMENDATION(S)

THAT the report titled Tipping Fee Review of Materials Received for Diversion at SCRD Facilities be received;

AND THAT the tipping fee for appliances containing Freon be decreased from $40 to $30 per unit;

AND THAT a tipping fee for cardboard be established at $285 per tonne;

AND THAT the tipping fee for gypsum be increased from $265 to $290 per tonne;

AND THAT the tipping fee for metal be increased from $70 to $140 per tonne;

AND THAT the tipping fee for propane tanks up to 1lb be increased from $0.50 to $2 per unit;

AND THAT the tipping fee for propane tanks 1lb up to 25lbs be increased from $2 to $10;

AND THAT the tipping fee for propane tanks over 25lbs be increased from $5.50 to $10;

AND FURTHER THAT these tipping fees be incorporated in an amendment of Bylaw 405.

BACKGROUND

The Sunshine Coast Regional District operates the Sechelt Landfill and Pender Harbour Transfer Station facilities. At these facilities, materials are either collected for diversion (recycling) or for burial in the Sechelt Landfill.

Diversion programs include materials such as cardboard, gypsum, mattresses, metal, paint, propane tanks, tires and yard and garden green waste.

In 2017, there were many tender processes completed for diverted materials and a tipping fee review was initiated in 2018 to compare the existing tipping fees to the updated costs. This led to tipping fee increases to several materials such as mattresses and propane tanks to ensure that direct costs were fully funded from tipping fees and that a deficit position for specific material types were avoided. The exception at that time was mattresses which continued to be subsidized by other materials and green waste which is funded from taxation.

Three years later, in 2020, these same diversion materials required tender processes or contract extensions and thus a tipping fee review was initiated following the same approach as in 2018.

The purpose of this report is to inform the Committee of the results of the tipping fee review and provide recommendations for updating the tipping fees that are identified in the SCRD's Sanitary Landfill Site Bylaw 405.

DISCUSSION

Tipping Fee Review

The tipping fee review included reviewing the updated pricing from the 2020 tender processes and contract extensions along with 2019 expenditures and associated tonnages for both facilities.

The scope of the tipping fee review was limited to only those materials received for diversion and only for those that had tender processes or contract extensions completed in 2020. These include: appliances containing Freon, cardboard, gypsum, mattresses, metal and propane tanks.

Wood (clean and contaminated) tipping fees were set in 2019 and will be reviewed at the end of the current one year contract in 2021. Current tipping fees fully fund the direct costs.

A report regarding a program for re-diversion of waste is included on the Agenda for this meeting.

As well, a report regarding an update on the green waste program is also on the Agenda for this meeting.

Direct costs are considered the expenditures incurred for each diverted material and includes costs such as pre-processing, bin rental, hauling either on or off-Coast to the Vancouver area and processing fees. Based on the material, a combination of these expenditures are incurred.

In-direct costs such as staffing and other overhead costs to operate the Sechelt Landfill or Pender Harbour Transfer Station are not included in the scope of this review. An estimated increase of 2%-5% per material type would be required to incorporate the in-direct costs. These costs are currently funded from MSW. These costs will be incorporated into the upcoming MSW review as part of the Future Waste Disposal Analysis Study as the MSW rate has not been amended since 2013.

The results of the tipping fee review are summarized in Table 1. For most materials, the current tipping fee is lower than the direct costs. However, the tipping fee for appliances containing Freon is now higher than the direct costs as a result from the recent tendering process.

Table 1 – Diverted Materials Current Tipping Fees Compared to Direct Costs

Material Category	Current Tipping Fee	Estimated Direct Costs		Unit of Measure	Types of Costs Incurred
		Pender Harbour Transfer Station	Sechelt Landfill		
Appliances containing Freon	$40	$29	$27	Per Unit	Pre-processing, hauling, processing
Cardboard	$150[1]	$225	$295	Per Tonne	Hauling, processing
Gypsum	$265	$324	$272	Per Tonne	Hauling, processing
Mattress	Dry $25 Wet $30 per mattress or boxspring	$46-$54[2]	$24-$32	Per Unit	Bin rental, hauling, processing
Metal	$70	$269[3]	$221[3]	Per Tonne	Hauling, bin rental, processing
Propane Tanks	$0.50 up to 1lb	$2	$2	Per Unit	Pre-processing, hauling, processing
	$2 1lb up to 25lbs	$12	$7		
	$5.50 over 25 lbs	$12	$7		

Diverted Materials Summary

Table 2 provides a summary of tonnage received by material type by site for the materials included in the tipping fee review.

Table 2 – 2019 Tonnage Summary

Material Category	Pender Harbour Transfer Station	Sechelt Landfill	Total	Unit of Measure
Appliances containing Freon	194	953	1,147	Units
Cardboard	17.29	75.35	92.64	Tonnes

[1] Cardboard is currently accepted as municipal solid waste (MSW) at the MSW rate of $150 per tonne.
[2] The costs for mattresses vary depending on whether the mattress is wet, dry or contains pocket coils. As well, the cost per mattress will vary depending on how many mattresses are placed in the containers.
[3] The SCRD will receive an anticipated $100 per tonne revenue that will offset the direct costs for metal.

Gypsum	49.46	445.8	495.26	Tonnes
Mattress	393	2,907	3,300	Units
Metal	201	735	936	Tonnes
Propane Tanks up to 1lb	449	2,290	2,739	Units
Propane tanks 1lb to 25lbs	135	462	597	
Propane Tanks Over 25lbs	18	21	39	

Financial Implications

Tipping fees are intended to fund all the direct costs associated with the diversion of a specific material. Proposed tipping fees for the materials were considered based on the direct costs for both facilities and the tonnages received.

A summary of the proposed tipping fee compared to the current fee is provided in Table 3.

The tipping fee for metal could be implemented at $140 per tonne and would likely be full cost recovery when taking into account the tonnage received at both sites and the anticipated revenue. However, increasing the tipping fee to $150 to align with the MSW rate would be operationally beneficial and would help mitigate the revenue amount, which varies based on market conditions. At 936 tonnes of metal in 2019, a tipping fee rate of $150 instead $140 per tonne would result in an additional annual revenue amount of $9,360.

Although, if metal is the same tipping fee rate as MSW, there is less financial incentive to separate the materials for recycling and disposal. Given this rationale, the proposed tipping fee for metal is $140 per tonne.

For mattresses, the current tipping fees were implemented earlier this year and represented an increase of $15 per mattress. Given the current fees, staff are not recommending a further tipping fee increase even though this means that some mattresses will not be full cost recovery and propose that if there is a mattress deficit , that it be funded from other materials. As part of the 2021 budget process, staff are bringing forward a proposal for the purchase of a used forklift for the Sechelt Landfill. This will help increase the number of mattresses placed into the container that is transported to Vancouver for recycling and thus help to decrease the per unit transportation costs, as well as lower transportation-related GHGs.

For propane tanks, the majority of the propane tanks in the category of 1lb to 25lbs are the 20lb tanks utilized for BBQs. The current tipping fee is $2, whereas the direct costs are $7-$12 depending on the facility. The proposed rate of $10 will ensure full cost recovery and aligns with propane tanks over 25lbs which have the same direct costs.

Table 3 – Proposed Changes to Tipping Fees

Diverted Material	Current Tipping Fee	Proposed Tipping Fee	Unit of Measure
Appliances containing Freon	$40	$30	Per Unit
Cardboard	$150	$285	Per Tonne
Gypsum	$265	$290	Per Tonne
Metal	$70	$140	Per Tonne
Propane Tanks	$0.50 up to 1lb	$2	Per Unit
	$2 1lb up to 25 lbs	$10	
	$5.50 over 25 lbs	$10	

Timeline for Next Steps

Based on the Board's recommendations, staff will prepare an amendment to Bylaw 405 and anticipate bringing it to a January 2021 Board meeting for the first three readings with adoption and thus implementation of any tipping fee changes in February 2021.

The amendment to Bylaw 405 will also incorporate Board resolution 320/20 No. 4 to include cardboard as a recyclable material so as to be able to apply the non-separated waste section of Bylaw 405 to cardboard.

A tipping fee review of municipal solid waste (MSW) will be conducted as part of the Future Waste Disposal Analysis Study that is underway. Results are anticipated for January 2021.

Staff will be reviewing the funding of the entire green waste program in the upcoming months and if appropriate, present the Board with options to increase the financial sustainability of the entire program.

Staff are preparing a report on a landfill disposal ban for recycling and organics. This report is anticipated at the end of Q4 2020 or early Q1 2021. Ban implementation will require an amendment to Bylaw 405.

Communications Strategy

Based on the Board's recommendations and timelines, staff would prepare a communications plan accordingly.

STRATEGIC PLAN AND RELATED POLICIES

This report is in support of the Board's Strategic Plan's strategic focus area of Asset Stewardship, the Financial Sustainability Policy, as well as the SCRD's Solid Waste Management Plan.

CONCLUSION

In 2020, several tender processes or contract extensions occurred for materials received for diversion at the Sechelt Landfill and Pender Harbour Transfer Station. To ensure financial sustainability, tipping fees need to fund all the direct costs.

As such, the current tipping fees were reviewed and compared to the results of the procurement processes and the 2019 tonnages and associated expenditures. For most materials, the current tipping fee is lower than the direct costs.

Staff have proposed tipping fee increases to most of the materials reviewed and a decrease to one. Any changes to the tipping fees requires an amendment to Bylaw 405. Anticipated start date of any changes is February 2021.

Reviewed by:			
Manager		CFO/Finance	X-A. Taylor
GM	X-R. Rosenboom	Legislative	
CAO	X- D. McKinley	Other	X – Arun Kumar

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Robyn Cooper, Manager, Solid Waste Services

SUBJECT: **SOUTH COAST GREEN WASTE DROP-OFF DEPOT OPERATIONS - UPDATE**

RECOMMENDATION(S)

THAT the report titled South Coast Green Waste Drop-off Depot Operations - Update be received;

AND FURTHER THAT the Town of Gibsons continue operating the South Coast Green Waste Drop-off Depot on a month-to-month basis from January 1, 2021 for a period up to June 30, 2021, at a monthly rate of $8,549.

BACKGROUND

The following recommendation was adopted at the July 23, 2020 Board meeting:

267/20 (in part) **Recommendation No. 8** *Request for Proposal (RFP) 2035002 Contract Award for South Coast Green Waste Drop-off Depot*

AND THAT staff negotiate an agreement for the long-term use of the current location of the South Coast Green Waste drop-off depot by the SCRD with the Town of Gibsons;

AND THAT staff initiate a procurement process for an operator the South Coast Green Waste drop-off depot at its current location;

AND THAT the funding of this service be from tipping fees or a combination of tipping fees and taxation;

AND FURTHER THAT staff bring forward information regarding financial implications of this service and funding options for the entire green waste program to a future Committee meeting.

The purpose of this report is to provide an update on the agreement and to seek direction to maintain service continuity.

DISCUSSION

The current arrangement with the Town of Gibsons for the operations of the South Coast Green Waste Drop-of Depot expires on December 31, 2020.

Staff are currently working on an agreement with the Town of Gibsons as per Board direction.

The agreement process is underway, however, has not yet been finalized.

In order to maintain service continuity of the South Coast Green Waste Drop-off Depot until the agreement is finalized and procurement for operations completed, staff recommend that the Town of Gibsons continue operation of the site on a month-to-month basis for a period up to June 30, 2021.

Staff confirmed with the Town of Gibsons on November 4, 2020 that they are willing to continue operating the site in 2021 for up to a six month period at a rate of $8,549 per month (exclusive of taxes). This is an increase from $8,450 per month in 2020.

Financial Implications

The approved budget for the South Coast Green Waste Drop-off depot operations is $101,400 funded from taxation, Regional Solid Waste [350]. There is an additional $143,000 approved 2020 budget for hauling and processing of green waste received at this drop-off depot.

Until procurement is completed, the total annual budget required for depot operations is unknown.

As the pandemic has resulted in more green waste being generated by residents, the tonnages for green waste delivered to all three sites (Pender Harbour Transfer Station, Salish Soils and the South Coast Depot) well exceeded the tonnages used when setting the 2020 budget for this service. This is having a substantial contribution to the anticipated deficit for the [350] Regional Solid Waste function for 2020. As this is not anticipated to change in 2021, staff will bring forward a report in early 2021 with options on how to address the increased costs associated with the hauling and processing costs in the 2021 budget. This report will also consider the anticipated operating costs of the South Coast Green Waste Drop-off Depot.

Timeline for next steps

A staff report regarding the outcome of the agreement is forthcoming to a Q1 2021 committee meeting.

Following execution of the agreement, a procurement process will be initiated for the depot operations. It is anticipated that a new operator would be in place by June 30, 2021.

As mentioned in the financial implications section of this report, in early 2021 a report will be brought forward with funding options for the entire green waste program.

STRATEGIC PLAN AND RELATED POLICIES

An agreement for the use of the current South Coast Green Waste Drop-off Depot site aligns with the SCRD's Strategic Plan's focus area of Working Together as part of the strategy of Increase Intergovernmental Collaboration.

CONCLUSION

The process for developing an agreement between the SCRD and Town of Gibsons for the long-term use of the current South Coast Green Waste Drop-off Depot site is underway.

In order to maintain service continuity of the South Coast Green Waste Drop-off Depot until the agreement is finalized and procurement for operations completed, staff confirmed with the Town of Gibsons that they are willing to continue operating the site on a month to month basis from

January 1, 2021 up until a period ending June 30, 2021 at a rate of $8,549 per month (exclusive of taxes). This is an increase from $8,450 per month in 2020.

A report regarding financial implications and funding options for the entire green waste program will be brought forward in early 2021 for consideration in the 2021 budget.

Reviewed by:			
Manager		CFO/Finance	X-T.Perreault
GM	X- R.Rosenboom	Legislative	
CAO	X-D. McKinley	Purchasing	X-V.Cropp

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Arun Kumar, Superintendent, Solid Waste Services

SUBJECT: **REQUEST FOR PROPOSALS (RFP) 2035009 CONTRACT AWARD FOR GREEN WASTE CONTAINER AND HAULING SERVICES**

RECOMMENDATION(S)

THAT the report titled Request for Proposals (RFP) 2035009 Contract Award for Green Waste Container and Hauling Services be received;

AND THAT a contract for Green Waste Container and Hauling Services be awarded to Salish Environmental Group Inc. in the amount up to $256,623 (plus GST);

AND THAT the delegated authorities be authorized to execute the contract.

BACKGROUND

The Sunshine Coast Regional District (SCRD) currently provides a green waste recycling program by providing multiple locations for residential and commercial customers to drop-off their green waste.

At the Sechelt Landfill, Pender Harbour Transfer Station and the South Coast Drop-off Site, the SCRD utilizes containers to collect the green waste and full containers are transported to Salish Soils for composting. Container and transportation services are provided by a contracted service provider. The current contract for this service required re-initiating a procurement process.

In accordance with the SCRD Procurement Policy, Request for Proposal (RFP) 2035009 for Green Waste Container and Hauling Services was issued on September 4, 2020 and closed on October 2, 2020. One addendum was issued. The RFP sought qualified companies to provide container and transportation services for the SCRD's green waste program. Proposals could be submitted for any or all of the drop-off locations. It sought proposals for a contract term of three years with an option to renew up to two additional one-year terms.

DISCUSSION

RFP Analysis

Three compliant proposals were received. Led by the Purchasing Department, the evaluation team consisted of three team members. The evaluation committee reviewed and scored the proposals against the criteria set out in the RFP. Staff recommend that a contract be awarded to Salish Environmental Group Inc. in the amount up to $256,623 (plus GST). They met the specifications as outlined in the RFP and are the best value overall for the above-mentioned service.

Name	Total Contract Value (in the amount up to, not including GST)
Salish Environmental Group Inc.	**$256,623**

Financial Implications

The following table summarizes the contract value by year.

	Year 1	**Year 2**	**Year 3**	**Total (excluding GST)**
Salish Environmental Group Inc.	$83,420	$85,464	$87,739	**$256,623**

Green waste container and hauling services is primarily funded from taxation, Regional Solid Waste [350] with a small amount funded from tipping fees for commercial green waste delivered to the Pender Harbour Transfer Station or Sechelt Landfill. However, total tipping fees from green waste equated to less than $800 in 2019.

Between the three drop-off locations, the total available 2020 budget for this service is approximately $89,000. Therefore, a Financial Plan amendment is not required.

It should be noted that the actual expenditures for this service vary each year and are dependent on actual tonnage of green waste received. The RFP was based on the actual tonnages received in 2018, which were considered to be relatively high. Due to the community response to the current pandemic the green waste volumes have exceeded those of 2018 and consequently the expenditures associated with container and hauling services as well. Staff will review the funding for the entire green waste program (operating South Coast Depot, containers, hauling, and processing) in the upcoming months and if appropriate present the Board with options to increase the financial sustainability of the entire program.

Timeline for next steps

If approved, staff will proceed to the next step in the procurement process and anticipate a contract start date of January 1, 2021.

A report outlining the status of the South Coast green waste program is on the Agenda for this meeting.

STRATEGIC PLAN AND RELATED POLICIES

The purchasing process followed for this service is aligned with the SCRD Procurement Policy.

This supports the Solid Waste Management Plan's target of 65%-69% diversion by providing a recycling option for green waste.

CONCLUSION

In accordance with the SCRD Procurement Policy, a Request for Proposal (RFP) for Green Waste Container and Hauling Services was issued for three SCRD drop-off locations. The RFP

was issued on September 4, 2020 and closed on October 2, 2020. One addendum was issued. The term of the contract is three years with an option to extend up to two additional one-year periods.

Three proposals were received.

Staff recommend that RFP 2035009 Green Waste Container and Hauling Services be awarded to Salish Environmental Group Inc. in the amount up to $256,623 (plus GST).

The contract value is within available budget.

Reviewed :			
Manager	X - R. Cooper	CFO/Finance	X-T. Perreault
GM	X - R. Rosenboom	Legislative	
CAO	X -D. McKinley	Purchasing	X-V. Cropp

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: Arun Kumar, Superintendent, Solid Waste Services

SUBJECT: **DISPOSAL FOR BOATS AND RECREATION VEHICLES PILOT PROJECT - UPDATE**

RECOMMENDATION(S)

THAT the report titled Disposal for Boats and Recreation Vehicles Pilot Project - Update be received;

AND THAT the SCRD continue to accept boats and recreation vehicles under specific conditions at the Sechelt Landfill at the tipping fee rate of $265 per tonne.

BACKGROUND

In Q1 2020, staff identified an emerging demand for the disposal of boats and recreation vehicles and as such prepared a staff report to the March 19, 2020 Infrastructure Services Committee. This report identified that there was no local disposal option for these items and that the Sechelt Landfill could accept these items under certain conditions. Staff sought Board direction regarding disposal options on boats and recreation vehicles.

The following resolution was adopted at the March 26, 2020 Board Meeting (in part):

119/20 **Recommendation No. 4** *Disposal Options for Boats and Motorhomes*

AND THAT staff initiate the process under Option 1 as a pilot project – to accept boats, motorhomes and camping trailers under specific conditions at the Sechelt Landfill;

AND THAT the proposed tipping fees of $265 per tonne for boats, motorhomes and camping trailers be approved and incorporated in an amendment to Bylaw 405;

AND FURTHER THAT staff report back to a Committee in Q4 of 2020 with an evaluation of the effectiveness of the pilot project.

After Board approval, staff updated the relevant bylaw and started accepting boats and recreation vehicles for disposal at Sechelt Landfill on May 19, 2020 as a pilot project.

The purpose of this report is to present the results of the boats and recreation vehicles pilot project and to seek Board direction regarding whether or not the SCRD should continue to accept boats and recreation vehicles.

DISCUSSION

The following parameters were monitored and evaluated during this pilot project. The information presented below is comprised from the project launch day of May 19, 2020 to October 30, 2020.

Conditions of Acceptance

In order for boats and recreation vehicles to be accepted for disposal at the Sechelt Landfill, the following conditions had to be met:

- Any liquids, such as oil, and recyclable materials (e.g. wood, metal including drive train and frame) must be removed prior to disposal.
- The items must be dismantled into 1 metre (four feet) sections or less.
- The materials may only be disposed of at the Sechelt Landfill.

Users of this disposal service did not express apprehension around the conditions for acceptance.

Quantities Received

As with other materials, boats and recreation vehicles arriving at the Sechelt Landfill were weighed on the inbound scale. Fifteen loads of boats and three loads of recreation vehicles were received. Combined, these loads were a total of 8.4 tonnes, with 1.6 tonnes originating from recreation vehicles and 6.8 tonnes from boats. Because materials are required to be cut into small sections, the individual number of boats and motorhomes received is not available.

Tipping Fee Rates

Under the SCRD's Sanitary Landfill Site Bylaw No. 405, the tipping fee was established at $265 per tonne for boats and recreation vehicles. Users under this pilot project did not indicate rate concerns. Since launch, approximately $2,240 worth of disposal fees have been collected between these two material categories.

Landfill Life

During this pilot project, Sechelt Landfill received 8.4 tonnes of boats and recreation vehicles. Landfilling of these two materials, in the quantities received, has consumed approximately 5 cubic metres of air space. This represents a reduction of approximately 0.1 day in total available landfill life.

Operational Considerations

As the Sechelt Landfill accepted these new materials, staff monitored the site operations to identify any challenges or potential issues.

Users would place their prepared boats and recreation vehicles into the existing containers identified for garbage in the public drop-off area. No significant challenges were identified with integrating the new materials with the existing waste in the containers or during landfilling.

Other Disposal Options for Boats and Recreation Vehicles

There has been no changes to local disposal options for boats and recreation vehicles since the commencement of the pilot program. Other than the SCRD's pilot program, there is one local option for the disposal of recreation vehicles and none for boats.

Options

Staff identified the following two options for the Committee's consideration:

Option 1: Continue accepting boats and recreation vehicles under specific conditions at the Sechelt Landfill at the tipping fee rate of $265 per tonne (recommended)

Based on a comprehensive review of the pilot project and the above findings, staff recommend that the SCRD continue to accept boats and recreation vehicles for disposal at the Sechelt Landfill. Staff recommend to continue with the acceptance parameters and tipping fee as set out in the pilot project.

Continuing the acceptance of these items would promote legal disposal options for boats and recreation vehicles and thus reduce the risk of illegal disposal or abandonment. Furthermore, based on the quantities received, there is minimal landfill life implication by providing a local disposal option.

Option 2: Discontinuing program and stop accepting boats and recreation vehicles

Discontinuing the program would result in no local disposal option for boats and one limited local disposal option for recreation vehicles. With no or limited local disposal options, these items may be disposed of illegally or abandoned.

This option is not recommended.

Timeline for Next Steps

If option 1 is selected, there are no additional steps required. The pilot project would end and the items would continue to be accepted for disposal at the Sechelt Landfill under the current acceptance parameters and tipping fee.

If option 2 is selected, then an amendment to Sanitary Landfill Site Bylaw No. 405 would be required so the tipping fees and definitions can be removed. In addition, communication to the public, providing notice that the program has ended, would need to occur. As such, if option 2 is selected, staff recommend an end date of December 31, 2020 to provide notice of the end of the pilot project.

Financial Implications

The tipping fee of $265 per tonne has been fully funding the disposal costs.

STRATEGIC PLAN AND RELATED POLICIES

N/A

CONCLUSION

The SCRD implemented a pilot program on May 19, 2020 to accept boats and recreation vehicles for disposal at the Sechelt Landfill. The pilot program was implemented to address the lack of local disposal options for these items.

Findings from the pilot program have indicated there are minimal landfill life implications, no financial implications, no operational concerns, and no concerns from users of the program.

Given the findings from the pilot program and that there have been no known changes in local disposal options for boats and recreation vehicles, staff recommend the SCRD continues to accept boats and recreation vehicles for disposal at the Sechelt Landfill with the current acceptance procedures and tipping fee.

Reviewed by:			
Manager	X - R. Cooper	Finance	X-T-Perreault
GM	X - R. Rosenboom	Legislative	
CAO	X- D. McKinley	Other	

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Infrastructure Services Committee – November 19, 2020

AUTHOR: James Walton, Manager Transit and Fleet

SUBJECT: **TERMS OF REFERENCE SUNSHINE COAST TRANSIT FUTURE ACTION PLAN**

RECOMMENDATION(S)

THAT the report titled Terms of Reference Sunshine Coast Transit Future Action Plan be received;

AND THAT the Terms of Reference for the Sunshine Coast Transit Future Action Plan be approved.

BACKGROUND

At its October 10, 2019 meeting the Board adopted the following recommendations related future service levels for the transit system on the Sunshine Coast:

244/19 **Recommendation No. 5** *2020-2021 Transit Expansion Memorandum of Understanding*

THAT the report titled 2020-2021 Transit Expansion Memorandum of Understanding be received;

AND THAT staff work with BC Transit to research options and resources required to implement service expansions in 2021-2022 and report back to the Board in Q1 2020;

AND FURTHER THAT staff work with BC Transit to develop a project plan to update the Transit Future Plan to guide future expansion decisions.

The purpose of this report is to seek Board approval for the Terms of Reference for a Transit Future Action Plan for the Sunshine Coast's transit systems.

DISCUSSION

Analysis

In 2014 the Transit Future Plan for the Sunshine Coast was adopted. This plan is the service specific strategic plan guiding the service levels, routes and infrastructure expansions of the custom and conventional transit system on the Sunshine Coast.

The Transit Future Action Plan (TFAP) will be an update to the 2014 plan and will address the impacts of the COVID-19 Pandemic on the transit service. A comprehensive Terms of Reference (TOR) for this plan is included as an attachment to this report (Attachment A).

The transit service and infrastructure priorities identified within the TFAP are based on a review of existing transit services, changing land uses and land use plans, and feedback from

stakeholders and the general public. These priorities will be separated by timeline, with short (1-2 years), medium (3-4 years), and long-term (5+ years) options.

As directed by the Board (Recommendation 17, Resolution 242/19) staff will consider options for Park and Ride as part of the development of the TFAP.

The list of stakeholders that will be engaged in this process will be confirmed early on and will included all organizations that are part of the Transportation Advisory Committee, and could include other member local governments, First Nations, Capilano University, Vancouver Coastal Health, School District 46 and the business community. Besides stakeholders, consultation with the general public and in particular, current and potential ridership will be included.

Operational and Intergovernmental Implications

The development of the TFAP will be led by BC Transit and supported by a project team that will include SCRD staff from several divisions. Staff will coordinate the publication participation with other such initiatives.

Timeline for next steps

If the TOR were to be approved, this project will commence in Q1 2021 and the timelines as currently included in the TOR will be updated accordingly. Draft options will be presented to the Board and the Transportation Advisory Committee for endorsement before public feedback is sought. The final options and a public engagement summary will be presented to the Board for endorsement prior to inclusion in the Final TFAP. The TFAP will subsequently be presented to the Board for final adoption.

STRATEGIC PLAN AND RELATED POLICIES

N/A

CONCLUSION

The proposed Transportation Future Action Plan process will update the strategic plan on the service levels, routes and infrastructure expansions of the custom and conventional transit system on the Sunshine Coast. Such plan will include a COVID-19 Recovery Strategy.

Staff recommend the approval of the Terms of Reference for the Sunshine Coast Transit Future Action Plan.

Attachments:

A - Terms of Reference Sunshine Coast Transit Future Action Plan

Reviewed by:			
Manager		Finance	
GM	X – R. Rosenboom	Legislative	
CAO	X – D. McKinley	Other	

Terms of Reference:
Sunshine Coast **Transit Future Action Plan**

1. INTRODUCTION

Completed in 2014, the Sunshine Coast Transit Future Plan provided a vision of the transit network on the Sunshine Coast over the next 25 years. This established a vision and set goals for the transit system, identified the future transit network, and outlined detailed priorities for service expansions and infrastructure projects required to achieve the goals. Since the adoption of the Transit Future Plan, several of the short-term priorities have been achieved, but there are several initiatives that are still outstanding, as detailed below:

Status of Sunshine Coast Transit Future Plan (2014) priorities

Completed	Incomplete/outstanding
✓ Increase transit service to West Sechelt ✓ Increased frequency to West Sechelt with 30-minute frequency at peak times ✓ Provide limited service to the Botanical Gardens ✓ Serve Chatalech Secondary School	*Service expansions:* ▪ Introduce service to Pender Harbour ▪ Establish 30-minute frequency from Sechelt to Langdale at all times ▪ Increased frequency to serve Halfmoon Bay on hourly frequency Monday-Saturday ▪ Provide service to East Porpoise Bay Road ▪ Provide service to Sandy Hook and Tuwanek *Infrastructure projects:* ▪ Implementation of the Gibsons Exchange ▪ Implementation of the Field Road Exchange ▪ Implementation of the Sechelt Park and Ride ▪ Implementation of the Gibsons Park and Ride ▪ Construction of a satellite operating facility

Six years after adoption, the Sunshine Coast transit priorities are being revisited. The purpose of this work is to reaffirm and reprioritize proposals over the next five years and beyond. BC Transit refers to the next phase of required work as the Transit Future Action Plan (TFAP), and this Terms of Reference outlines the objectives, scope, deliverables, approach and timeline for completion. The updated plan will be developed in collaboration with the local partners, and in consideration of the goals and direction identified in local and regional plans.

2. PLAN PURPOSE

The Transit Future Action Plan (TFAP) builds upon the 2014 Transit Future Plan and defines a practical implementation strategy to support investment in the transit system and ridership growth. The TFAP will build on the vision, goals and targets of the Transit Future Plan and will update transit service and infrastructure priorities for the Sunshine Coast region. The TFAP will revisit the annual investment targets established in the Transit Future Plan, and confirm if those targets and investment trajectories still align with the goals of the communities within the region. The TFAP will also consider service optimization - examining current levels of service and opportunities for more efficient service delivery. Service optimisation strategies will be considered in tandem with any service expansion recommendations, which will ensure transit remains effective, reliable and appropriate to the needs of the respective communities.

The updated transit service and infrastructure priorities will help shape how transit operates in the region for the next 25 years. As with the Transit Future Plan, the TFAP will update and support community goals and objectives to strengthen the link between transportation and land-use in pursuit of sustainable growth. The TFAP will also serve to inform any future local or regional transportation plans.

The COVID-19 pandemic has caused a change in the way transit services are operated and a decline in ridership in the Sunshine Coast Transit System. The TFAP will analyse the pandemic impact and include a response and recovery elements to help guide ridership recovery.

PLAN OBJECTIVES

The objectives of the Sunshine Coast Transit Future Action Plan are as follows:

- **Itemize Transit Future Plan progress to date:**
  - Identify items completed in the 2014 Transit Future Plan, items underway, and items outstanding.
  - Review and identify relevant priorities to carry forward into the plan update.

- **Develop a COVID-19 Recovery Strategy:**
  - Detail a strategy to regain lost ridership as a result of the COVID-19 pandemic – drawing on best practices across the Province and from North America more generally.
  - Conduct scenario planning to identify service strategies and investment trajectories to respond appropriately to impacts of COVID-19.
  - Provide information on the potential integration of public transit with new transit technologies and alternatives.

- **Reaffirm mode share targets and associated annual investment**
  - The Transit Future Plan identified mode share and ridership targets for the Sunshine Coast region based on the Provincial Transit Plan. The TFAP will revisit these 25-year mode share and ridership targets and identify the investment required to achieve those targets.

- **Identify transit service and infrastructure priorities:**
  - Review the Transit Service design Standards and Performance Guidelines developed through the Transit Future Plan process and evaluate the system against these. Develop a Service Performance Report to support evidence-based decision-making a
  - Identify short and medium-term service expansions and infrastructure projects (1-5 years) to assist in the development of local capital and operating budgets.
  - Update service, fleet and facility requirements to accommodate the future vision and priorities, such as early implementation of low-carbon fleet.
  - Identify longer-term service and infrastructure priorities, including recommendations for phasing.

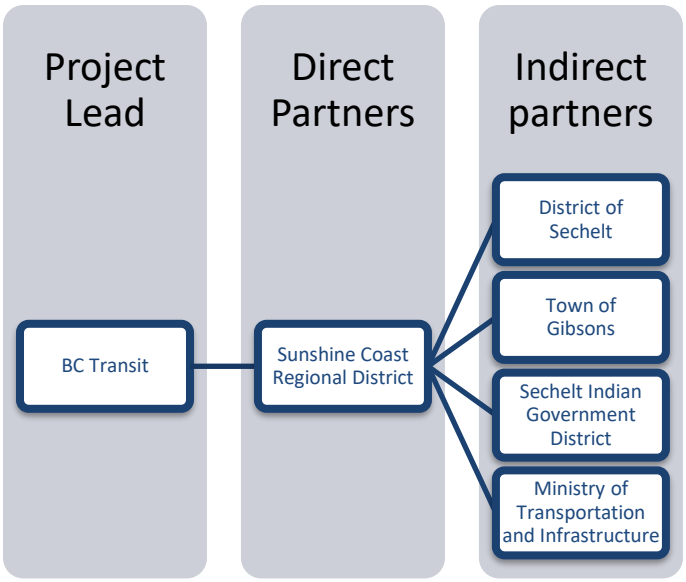
- **Build on relevant transportation plans and policies:**
  - Ensure that transit priorities align with the Official Community Plans, Sunshine Coast Strategic Plan 2019-2023, Integrated Transportation Study (2011), climate action plans, and other local planning initiatives.
  - Align with the *BC Transit Strategic Plan* (2020), including initiatives to increase integration with other sustainable modes of travel, grow ridership, influence land-use and development patterns, identify and develop transit priority corridors, increase our environmental, social and economic accountability, and enhance partnerships.

3. PLAN ENGAGEMENT

Developing the 2014 Transit Future Plan involved significant public engagement, incorporating partner, stakeholder, and community feedback into a plan that represented a unified vision for transit across the region. The TFAP will build upon that process, relying on input from key stakeholders, elected officials and the public to develop the TFAP and its vision for the Sunshine Coast for years to come.

Partner collaboration: The plan will be developed by BC Transit through a collaborative process with substantial input from the Sunshine Coast Regional District (SCRD). The core project team will include staff from BC Transit and the SCRD.

Stakeholder consultation: Local stakeholders from key transportation interest groups will be invited to participate at key stages in the development of the plan. Key stakeholders will be identified by the local partner, but participation will be sought from the Sechelt First Nation, Capilano University, Vancouver Coastal Health, staff from the respective road authorities, the business community, and transit users. Engagement with stakeholders will be facilitated through SCRD staff.



- **Public engagement:** The transit planning process seeks to be reflective of community desires, and public engagement is critical to ensure that the service and infrastructure priorities drafted by the project team align with public interest. Public engagement will seek to be inclusive, soliciting comment from both transit users and others through an online engagement portal with capacity for surveys and information. Video meetings may be held with volunteers to delve deeper into specific proposals or priorities. Public engagement will also provide an opportunity to celebrate transit system achievements to date and further promote the local transit system.

The approach to engagement will incorporate several key principles, including:

- **Inform -** Continually provide information to local partners, stakeholders, the operating company and the public to assist in understanding transit issues and opportunities;
- **Listen and learn -** Project leaders, partners and stakeholders will listen to and learn from each other's views, plans, concerns and expectations;
- **Consult -** Public feedback will be obtained through a range of consultation efforts to assess issues and develop options to contribute to the decision making process; and
- **Collaborate -** Working in close collaboration will occur at all stages to assess issues, prepare options, and make recommendations.

Plan engagement will occur in two phases, detailed below:

- **Phase One:** The first phase of engagement is proposed to take place in the fall 2020, will focus primarily on key stakeholders, staff representatives from the Sunshine Coast Regional District (SCRD) and the SCRD operating company. This will be facilitated through video conferencing. Some online engagement will also be conducted in this phase, to begin gathering feedback from the public regarding customer satisfaction and existing transit priorities and initiatives. No in-person events are planned for this phase.

- **Phase Two:** The second phase of engagement is proposed to take place in the winter of 2021. The method of engagement in phase 2 will be through the BC Transit online engagement

platform. This platform will include information about the transit service, the project objectives and proposed deliverables. The online platform will help to guide the public to provide their input on the future of transit service for their community, through an online survey and interactive map of the transit service strategies. This online engagement will be supported by a media campaign to create awareness about the project and encourage public feedback online. No in-person open house style engagement events are planned.

4. SCOPE OF WORK

The Transit Future Action Plan will include the following components:

A. Project Launch: Set the stage to identify priorities for the transit system. This includes:

- Review the 2014 Transit Future Plan priorities, and determine which are to be carried forward.
- Gather input and feedback from the core project group on current transit planning issues and opportunities, and collect early input on priorities for the transit system.

B. Existing Conditions and Performance Review : Review key aspects of the Sunshine Coast transit system today:

- Analyze service and ridership trends since 2014, review customer surveys and front-line staff feedback.
- Assess impact of COVID-19 pandemic on ridership trends.
- Conduct ridership analysis, schedule adherence and service reliability data (as available).
- Review issues and opportunities for transit operations, facilities (i.e. transit garage), passenger amenities, and accessibility.
- Review local plans to identify trends in land use, road network, population and employment, etc. With the information available, identify implications for local area service infrastructure and fleet.

***Deliverable*:** Existing conditions will be documented and provided in a report for the core project team for review and comment. This information will help to inform service priorities including optimisation strategies and will ultimately be included into the final TFAP.

C. Draft Options: BC Transit, in collaboration with the core project team, will prepare draft options including:

- Draft transit service priorities and infrastructure improvement options for the short term (1-5 years)
- Prepare draft concepts for route, service level and infrastructure changes in the medium/long-term (5 years +)

Deliverable: All transit service priorities and infrastructure options will be circulated to the core project team for review and comment. Feedback received will be taken into account as options are refined.

Final draft service priorities will be presented for approval by the SCRD Board to proceed to public engagement.

D. Public Engagement: A public engagement process will be carried out to present draft transit priorities for community input, feedback and prioritization. This process will include online surveys, meetings/workshops, and other engagement initiatives. Marketing and promotion for these events will take place in various formats, including online (through the project website), social media, local media, and on-board transit vehicles as appropriate. All input received will be summarized to inform the final development of the draft priorities.

***Deliverable*:** Verbal and online feedback received will be gathered and documented within an engagement summary report. This information will be summarized and included in the final TFAP.

E. Final Report: A final Sunshine Coast Transit Future Action Plan document with recommendations will be produced and presented the SCRD Board[1]. The final report will describe the planning process, and detail service and infrastructure priorities.

***Deliverable*:** A final report (electronic) will be presented to the core project group for review and approval. Council and Board approval and/or endorsement from our direct local government partners will be sought, after which a final version will be distributed to all partners electronically and available via a web-friendly format to facilitate easy distribution and promotion.

F. Implementation: Once the TFAP is approved, the service change priorities identified within it will inform the development of future three-year Service and Financial Strategies and Annual Service Plans for the local governments' approval. This will be reflected in the annual TIPS (Transit Implementation Process) memorandums distributed from BC Transit to the local partners.

[1] If desired, presentations to our indirect local government partners will be facilitated through the SCRD.

5. Timeline

Date*	Deliverable
Fall 2020	• Seek endorsement of *Transit Future Action Plan* Terms of Reference from SCRD Board. • Provide presentation to SCRD Board on the TFAP project process. If desired, these materials can include options on transit mode share targets and associated annual investment requirements for elected official consideration (including local budget impacts).

Fall 2020 to Winter 2021	• Phase one engagement and information collection, including:
	  ○ Discussions with key stakeholders on Transit Future Plan progress to date and future priorities,
	  ○ Analysis of existing transit system,
	  ○ Review of data/public input to date and
	  ○ Review of local plans.
	• Development of service concepts and standards.
	• Review mode share target options and associated investment requirements (including local budget implications) for presentation to the SCRD Board.

Winter 2021 to Spring 2021	• Phase two public engagement – present draft service and infrastructure priorities to the public for comment and feedback. • Prepare public engagement summary report for the core project team • Analyze results and distill options, based on feedback from the core project team, other stakeholders and the public. • Compile draft service and infrastructure priorities and review with project core team. • Deliver service change proposals to core project team for comment and feedback.
Summer 2021	• Present public engagement summary and final TFAP options to the SCRD Board for endorsement and inclusion within TFAP.
Fall 2021	• Finalize and approve the TFAP.

* Dates subject to change

RECOMMENDATION AND SIGNOFF

That the Sunshine Coast Regional District agrees to the objectives, deliverables, scope of work and timelines of this Transit Future Action Plan and requests BC Transit to complete it within the noted timeline.

Sunshine Coast Regional District (SCRD)

Name: _____ Position: _____

Signature: _____ Date: _____

BC Transit

Name: *Rob Ringma* Position: *Senior Manager, Government Relations*

Signature: _____ Date: _____

SUNSHINE COAST REGIONAL DISTRICT
TRANSPORTATION ADVISORY COMMITTEE
October 15, 2020

RECOMMENDATIONS FROM THE TRANSPORTATION ADVISORY COMMITTEE MEETING HELD VIA ZOOM

PRESENT:		
(Voting Members)	Director, Electoral Area E, Chair	Donna McMahon
	Director, Electoral Area A, Vice-Chair	Leonard Lee
	Director, Electoral Area B	Lori Pratt
	Director, Electoral Area F	Mark Hiltz
	Director, District of Sechelt	Darnelda Siegers
	Director, District of Sechelt	Matt McLean
	Director, Town of Gibsons	David Croal
	Transportation Choices (TraC)	Alun Woolliams
	Trustee, School District No. 46	Sue Girard
	BC Ferries	Robert Edwards
	Ministry of Transportation and Infrastructure	Colin Midgley
	Southern Sunshine Coast Ferry Advisory Committee	Diana Mumford
ALSO PRESENT:		
(Non-Voting)	Chief Administrative Officer	Dean McKinley
	GM, Infrastructure Services	Remko Rosenboom
	Manager, Transit and Fleet	James Walton
	RCMP Staff Sergeant	Poppy Hallam
	SCRD Administrative Assistant / Recorder	Tracy Ohlson
	Public	1
	Media	1

CALL TO ORDER 3:01 p.m.

AGENDA The agenda was adopted as presented.

MINUTES

Recommendation No. 1 *Transportation Advisory Committee Meeting Minutes of July 16, 2020*

The Transportation Advisory Committee recommended that the Transportation Advisory Committee meeting minutes of July 16, 2020 be received.

REPORTS

Recommendation No. 2 *Transit Schedule Options for Winter and Spring 2021*

The Transportation Advisory Committee recommended that the report titled Transit Schedule Options for Winter and Spring 2021 be received.

Recommendation No. 3 *Excerpt of Transportation-Related Items from Q3 - Quarterly Report*

The Transportation Advisory Committee recommended that the report titled Excerpt of Transportation-Related Items from Q3 – Quarterly Report presented at the October 15, 2020 Infrastructure Service Committee meeting be received.

Recommendation No. 4 *BC Ferries Safe Restart Funding*

The Transportation Advisory Committee recommended that the report titled BC Ferries Safe Restart Funding be received.

Discussion included the following points:

- *Funding delays due to election;*
- *Concern about use of capital funds for operational purposes; and*
- *Levels of vehicle and foot traffic on ferries.*

Recommendation No. 5 *BC Ferries Traffic Statistics 2020 and Media Releases*

The Transportation Advisory Committee recommended that the BC Ferries Traffic Statistics 2020 and Media Releases be received.

Discussion included the following points:

- *New BC Ferries website; and*
- *Route 3 exempt from requirement to leave vehicle deck during travel.*

Recommendation No. 6 *Active Transportation Week and Active Transportation Report*

The Transportation Advisory Committee recommended that the report titled Active Transportation Week and Active Transportation Report be received.

Discussion included the following points:

- *Overview of Active Transportation Week events.*

COMMUNICATIONS

Recommendation No. 7 *Correspondence from Transportation Choices Sunshine Coast Regarding Active Transportation Survey*

The Transportation Advisory Committee recommended that correspondence from Alun Woolliams of Transportation Choices Sunshine Coast dated September 28, 2020 regarding the Active Transportation Survey be received.

Discussion included the following points:

- *Community Safety Enhancement Program funding;*
- *Survey results with areas of concern; and*
- *Examples of projects funded by the Community Safety Enhancement Program in other communities.*

Recommendation No. 8 *Transportation Choices Sunshine Coast Active Transportation Improvements Report*

The Transportation Advisory Committee recommended that the Transportation Choices Sunshine Coast Active Transportation Improvements Report be forwarded to a Planning and Community Development meeting to be formally received by the SCRD Board.

Recommendation No. 9 *Meetings with Ministry of Transportation and Infrastructure*

The Transportation Advisory Committee that SCRD staff reach out to staff at the Ministry of Transportation and Infrastructure to set up a meeting;

AND THAT SCRD elected officials and Ministry of Transportation and Infrastructure elected officials meet at their earliest convenience.

Recommendation No. 10 *Correspondence from Langdale PAC Regarding Request for Signage and Improvements to Port Mellon Highway and YMCA Road*

The Transportation Advisory Committee recommended that correspondence from the Langdale Parent Advisory Council dated October 5, 2020 regarding signage and improvements to the Port Mellon Highway and YMCA Road be received.

Discussion included the following points:

- *Appreciation for improvements to patrols and traffic enforcement;*
- *Signage improvements;*
- *Enhanced safety measures and crosswalk; and*
- *Opportunities to slow down traffic.*

Recommendation No. 11 *Letter of Support for Langdale Parent Advisory Council*

The Transportation Advisory Committee recommended that the SCRD write a letter in support of the Langdale Parent Advisory Council initiative to get a crosswalk across the Port Mellon Highway.

Recommendation No. 12 *Vancouver Coastal Health Webinar - Reverse the Trend of the Backseat Generation: Get Kids Moving through Active Travel to School*

The Transportation Advisory Committee recommended that the Vancouver Coastal Health Webinar - Reverse the Trend of the Backseat Generation: Get Kids Moving through Active Travel to School information be received.

Discussion included the following points:

- *Preregistration for webinar required;*
- *New BC Healthy Communities grant for active transportation routes for students; and*
- *COVID impacts on fitness of students.*

Recommendation No. 13 *Correspondence from BC Ferries Regarding Engagement Project Update*

The Transportation Advisory Committee recommended that the correspondence from Brian Anderson of BC Ferries dated October 8, 2020 regarding the Engagement Project Update be received.

Discussion included the following points:

- *Information to be shared with interested parties and local governments.*

ROUNDTABLE

Committee members provided roundtable updates as follows:

Director Tize (Roberts Creek) – Hoping for gas tax and bike lanes.

Director Hiltz (West Howe Sound) – Noted ditch on Trant Road has 10 meter high alder trees encroaching on Right of Way and whether it can be addressed by Ministry of Transportation and Infrastructure.

Director Siegers (District of Sechelt) – Noted the District of Sechelt has voted to apply for grant funding to complete separate walking lanes and bike paths on Trail Avenue from Sunshine Coast Highway to Kinnikinnick Elementary.

Director McLean (District of Sechelt) – Indicated the District of Sechelt is undertaking a new project to install sidewalks on Wharf Avenue and noted in the Corridor Study it was noted to add driving lanes on Wharf Avenue and that this is the right time to undertake that work in conjunction with the installation of sidewalks. Crosswalks at Chapman Bridge and Teredo are in need of repainting.

Director Croal (Town of Gibsons) – Noted that the Town of Gibsons is reviewing the transportation corridor through Gospel Rock which needs to be reassessed.

Sue Girard (School District No. 46) – Thanked the Committee for their communication and support.

Robert Edwards (BC Ferries) – Noted that access from Marine Drive may be limited on busy days with a possible ferry overload. Signage and the gate may be utilized to limit merging from Marine Drive.

Colin Midgley (MOTI) – Noted that available Covid funding stimulus allowed for paving of Redrooffs Road and Marine Drive. Shoulder widening on Highway 101 is set for spring. He also noted Elena Farmer is the new District Manager at Ministry of Transportation and Infrastructure.

Paul Kamon (Sunshine Coast Tourism) – Noted Sunshine Coast Tourism is applying to the Community Economic Recovery Infrastructure program to start an e-bike initiative to look at a rental platform for electric bikes for visitors in our community and getting around town.

Staff Sgt. Poppy Hallam (RCMP) – Noted several warnings have been issued for speeding in school zones, with 59 violation tickets and 40 warnings being issued. There have been four complaints of vehicles passing buses when red lights are flashing and a media campaign is forthcoming. RCMP members have undertaken training for road safety.

Dean McKinley (SCRD Chief Administrative Officer) – Noted he has reached out to Elena Farmer to discuss coordinated efforts on projects.

ADJOURNMENT 4:23 p.m.

_____

Committee Chair

SUNSHINE COAST REGIONAL DISTRICT

SOLID WASTE MANAGEMENT PLAN MONITORING ADVISORY COMMITTEE

October 20, 2020

RECOMMENDATIONS FROM THE SOLID WASTE MANAGEMENT PLAN MONITORING ADVISORY COMMITTEE MEETING HELD VIA ZOOM

PRESENT:		
(Voting Members)	Chair	I. Winn
	Members	J. Boyd
		D. New-Small
		G. Bennett
		P. Robson
		M. Cambon
		S. Higginson
ALSO PRESENT:		
(Non-Voting)	Director, Electoral Area E	D. McMahon
	Director, Electoral Area A	L. Lee
	Manager, Solid Waste Services	R. Cooper
	Infrastructure Services Assistant/Recorder	M. Martel
	Public	0
REGRETS:	PMAC Vice-Chair	S. White
	PMAC Member	B. Hetherington
	Solid Waste Programs Coordinator	A. Patrao

Directors, staff, and other attendees present for the meeting participated by means of electronic or other communication facilities in accordance with Sunshine Coast Regional District Board Procedures Bylaw 717.

CALL TO ORDER 11:04 a.m.

AGENDA The agenda was adopted as presented.

MINUTES

Recommendation No. 1 *PMAC Meeting Minutes of September 15, 2020*

The Solid Waste Management Plan Monitoring Advisory Committee recommended that the Solid Waste Management Plan Monitoring Advisory Committee meeting minutes of September 15, 2020 be received.

PRESENTATIONS AND DELEGATIONS

Robyn Cooper, Manager, Solid Waste Services, provided a verbal update on the launch of the curbside food waste collection program which included:

- Update on how many single family and multi-family homes have received their bins.
- Update on outreach and engagement of program.
- Preliminary results on the first two weeks of food waste collection.
- Update on feedback from residents to date.
- Overview of next steps for the program.

Discussion included the following:

- Anticipated tonnage versus preliminary results of collected food waste and garbage.
- Weight restriction of green bins, concern with manual collection.
- Participation of program and how many residents put out garbage on a non-garbage collection week.

BUSINESS ARISING FROM MINUTES AND UNFINISHED BUSINESS

SCRD Board Resolutions Related to Solid Waste

Robyn Cooper, Manager, Solid Waste Services, provided a verbal update that there were no SCRD Board resolutions related to Solid Waste from the September board meeting.

NEW BUSINESS

October 2020 Solid Waste Staff Reports

Discussion included the following:

- SCRD response to increase in tipping fees.
- Correlation between increase in tipping fees and illegal dumping.
- Parameters around the RFPs and contracts awarded.
- Review of Islands Clean Up.
- High level review of SCRD solid-waste related resolutions presented to the AVICC, UBCM and FCM.

Review of Draft SCRD Curbside Recycling Questionnaire

Discussion included the following:

- Background on board resolution to send out questionnaire to residents in Electoral Areas B, D, E and F.
- Goal is to issue and close questionnaire and share results with SCRD Board by end of 2020 or early 2021.
- Feedback included
    - Questionnaire is short and concise;
    - Clarification on curbside/depot headings to make distinction of what is collected from home and include name of depots;
    - Include examples of recyclable materials for each category;
    - Concern with use of the word curbside (not connecting to the term curbside);
    - Options for residents to complete who won't/can't complete online.

Review of Ministry of Environment and Climate Change Strategy Recycling Regulation Policy Intentions Paper

Discussion included the following:

- Overview of changes they are looking to implement.
- Opportunity to provide feedback individually and collectively as Committee to the SCRD Board.

NEXT MEETING Tuesday, November 17, 2020

ADJOURNMENT 12:55 p.m.

SUNSHINE COAST REGIONAL DISTRICT
WATER SUPPLY ADVISORY COMMITTEE

November 2, 2020

RECOMMENDATIONS FROM THE WATER SUPPLY ADVISORY COMMITTEE MEETING HELD VIA ZOOM

PRESENT:	Chair	S. Thurber
	Vice-Chair	D. McCreath
		D. Marteinson
		T. Beck
		M. Hennessy
		T. Adams
		P. Madden
		A. Skelley
		B. Fielding
		T. Silvey
ALSO PRESENT:		
	Director, Area D	A. Tize
	Director, Area F	M. Hiltz
	Director, Area A	L. Lee
	Director, Area E	D. McMahon
	District of Sechelt	D. Siegers
(Non-voting)	GM, Infrastructure Services	R. Rosenboom
	Water Sustainability Coordinator	R. Shay
	Administrative Assistant/Recorder	T. Ohlson
	Public	4
REGRETS:	J. Bowen	

Directors, staff, and other attendees present for the meeting participated by means of electronic or other communication facilities in accordance with Sunshine Coast Regional District Board Procedures Bylaw 717.

CALL TO ORDER 3:33 p.m.

AGENDA The agenda was adopted as presented.

WELCOME AND ROUNDTABLE

The Committee members each had a chance to share which aspect of water on the Sunshine Coast they were most passionate about.

PRESENTATIONS and DELEGATIONS

Simon Wing, Senior Hydrogeologist, Waterline Resources Inc. addressed the Committee regarding an overview of groundwater on the Sunshine Coast.

Discussion included the following:

- Aquifer mapping refined over time
- Aquifers referenced with numbers rather than names as in the past
- SCRD focus is on confined aquifers with large scale and large supply
- Geophysics is another tool to find groundwater but probably not necessary given large number of boreholes in area.

MINUTES

Recommendation No. 1 *Water Supply Advisory Committee Meeting Minutes of July 14, 2020*

The Water Supply Advisory Committee recommended that Water Supply Advisory Committee meeting minutes of July 14, 2020 be received.

Recommendation No. 2 *Water Supply Advisory Committee Meeting Minutes of August 11, 2020*

The Water Supply Advisory Committee recommended that Water Supply Advisory Committee meeting minutes of August 11, 2020 be received.

Recommendation No. 3 *Water Supply Advisory Committee Meeting Minutes of September 1, 2020*

The Water Supply Advisory Committee recommended that Water Supply Advisory Committee meeting minutes of September 1, 2020 be received.

Recommendation No. 4 *Water Supply Advisory Committee Meeting Minutes of October 5, 2020*

The Water Supply Advisory Committee recommended that Water Supply Advisory Committee meeting minutes of October 5, 2020 be received.

Discussion included the following:

- *Clarification provided regarding amendments to WASAC recommendations*

BUSINESS ARISING FROM THE MINUTES AND UNFINISHED BUSINESS

Recommendation No. 5 *2020 SCRD Board Resolutions Related to Water – October 2020*

The Water Supply Advisory Committee recommended that the 2020 SCRD Board Resolutions Related to Water – October 2020 be received.

REPORTS

The General Manager, Infrastructure Services provided the Committee with an update on current water supply projects including Langdale, Mary Anne Park West, Gray Creek, DL1312, Eastbourne Water System and the Raw Water Reservoir.

Discussion included the following:

- *Whether a Raw Water Reservoir is required if enough potential groundwater sources are found*

Recommendation No. 6 *Universal Water Metering and Leak Resolution Watermains*

The Water Supply Advisory Committee recommended that the report titled Universal Water Metering and Leak Resolution Watermains be received.

Discussion included the following:

- *Procurement process for supply and installation of water meters*
- *Grant funding for meters*
- *Inquiry why water meters not installed in the District of Sechelt and the Sechelt Indian Government District lands in the Sechelt area*
- *All Regional Water Service Area users pay for water meters for the District of Sechelt and Sechelt Indian Government District*
- *Pressurization of watermains for leak detection and potential impacts*
- *Public perception on impacts to water users with installation of water meters*
- *Content and Tactics for public outreach*
- *Water Conservation Plan requirements for grant funding*
- *Use of newspaper advertisement with SCRD Frequently Asked Questions*
- *Use of SCRD website homepage for information about water*

Recommendation No. 7 *Overview of Public Participation on Water in 2021*

The Water Supply Advisory Committee recommended that the report titled Overview of Public Participation on Water in 2021 be received.

Discussion included the following:

- *Differentiation of a public meeting and meetings held in public*
- *Recording of meetings*
- *Committee to provide comments to staff on public outreach at next WASAC meeting*

Recommendation No. 8 *October Water Staff Reports to WASAC*

The Water Supply Advisory Committee recommended that the report titled October Water Staff Reports to WASAC be received.

Discussion included the following:

- *Infrastructure Services Committee Quarterly Report*

NEXT MEETING: Monday, December 7, 2020 @ 3:30 p.m.

ADJOURNMENT 5:33 p.m.

HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Patrick Weiler
Member of Parliament
West Vancouver-Sunshine Coast-Sea to Sky Country

November 9, 2020

Dear Friends & Neighbours,

Our Government knows that fast, reliable and affordable high-speed internet is a necessity, not a luxury, for all Canadians, including those living in rural and remote communities. The COVID-19 pandemic has only further highlighted the importance of connectivity, and accelerated the need to connect all Canadians. We also know that Canada's economic recovery depends on connectivity in every household across the country as families need it for work, education, access to health services and to remain connected with loved ones.

I am therefore proud to relay today that our Government has launched the **Universal Broadband Fund**, which will help connect 98% of Canadian households to high-speed internet by 2026. The newly launched UBF will comprise of the following streams to help all Canadians get connected:

1. ***Rapid Response Stream***: This supports smaller projects that can be implemented quickly with the help of a streamlined application process. Applications are being assessed through a rolling intake process – final deadline for this stream will be on **January 15, 2021.**
2. ***Large, High-Impact Projects:*** This stream will fund transformative projects in size and scope which support a business case that can involve the Canada Infrastructure Bank. In conjunction with low-cost loans through the CIB, this stream will provide grants to further support the business case of a strong project. Application deadline for this stream is **February 15, 2021.**
3. ***Mobile Projects:*** This stream targets mobile network projects that primarily benefit Indigenous communities, including the deployment of mobile coverage within an Indigenous community or on roads that lead to Indigenous communities. Application deadline for this stream is **February 15, 2021.**
4. ***Core Universal Broadband Fund:*** The remaining UBF projects will support any project, including backbone and last-mile, which connect Canadian households to minimum speeds of 50/10mbps.

As part of this announcement, our Government is also committing $600 million to secure low-earth-orbit satellite capacity through Telesat in order to provide high-speed internet to the most rural and remote parts of Canada.

Constituency *Ottawa*
6367 Bruce Street | Suite 282, Confederation Building
West Vancouver | 229 Wellington Street, Ottawa
British Columbia V7W 2G5 | Ontario K1A 0A6
Tel.: 604-913-2660 | Fax.: 604-913-2664 | Tel.: 613-947-4617 | Fax.: 613-847-4620

These historic investments will help bridge the long-standing urban-rural digital divide here in our community and across the country, helping in particular to close the connectivity gap which currently exists in certain areas of the Sunshine Coast and the Sea to Sky Corridor.

With the UBF, we are on track to meet our goal to connect 98% of households by 2026 and every Canadian to high speed internet by 2030.

For more information on the Universal Broadband Fund and application details, please visit this webpage.

We stand ready to support your application in any way that we can, so please do not hesitate to reach out with any questions or concerns.

Sincerely,

Patrick Weiler, MP
West Vancouver-Sunshine Coast-Sea to Sky Country