

November 2019

Greaves Road Wastewater Local Service Asset Management Plan



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Version Log

This document was carefully prepared so that it can be maintained as a living document; a document that is continually edited and updated. Through the various edits and updates, this document may evolve and be expanded as needed. This may be as a result of infrastructure replacement or could be due to changes in regulatory requirements, technology, staffing, or environmental conditions. Regardless of the reason, updates to this asset management plan will be key to the ongoing operation of the Greaves Road wastewater local service.

Version	Revised By	Date	Description
1	D. Joseph	November 28, 2019	Final report for Board of Directors approval

Acknowledgements

Completion of this Asset Management Plan would not have been possible without contributions and support from the following staff:

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1. Local Service Information



Figure 1 – Map of Wastewater Local Service Area and Infrastructure

- Address: 12545 Greaves Road
- Original Construction: 1977
- Taken over by Sunshine Coast Regional District (SCRD): 1984
- Establishment of Local Service: 1996
- Major Upgrades: None to date
- Treatment System Owner: SCRCD
- Number of Fronting Parcels: 6 Residential
- Number of Users: 5
- Treatment Process: Septic tank
- Treatment Permit #: Not required
- Permitted Discharge Amount: < 22.7 m³/day
- Regulatory Authority: Public Health Act
- Effluent Receiving: Ground
- EOCP Classification: Unclassified
- Statutory Right of Ways: None required

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1.1. Development Details

The Greaves Road wastewater local service area is located in the Egmont / Pender Harbour Electoral Area (Area A) of the SCRD. The treatment and disposal systems are located in a vacant parcel of land used exclusively for the processing of wastewater.

This community septic system was constructed in 1977 to assist with the development of new single-family dwellings in the neighbourhood. The parcels in this service area were identified as having insufficient land to construct an onsite drainfield. The system was managed by the developer until 1984 when the SCRD began overseeing the service.

1.2. Established Bylaws

There have been various bylaws adopted by the SCRD Board of Directors that are relevant to the Greaves Road wastewater local service, as listed in Table 1.

Table 1 – Established Bylaws Pertaining to the Wastewater Local Service

Bylaw No.	Bylaw Name	Purpose
232A	Package Plants Service Unit (1983)	Established a designated area for the purpose of providing sewage collection, treatment and disposal within Areas A, B and E.
1026	Sewage Treatment Facilities Local Service (1996)	Converted the Package Plants Service Unit to a local service.
428.19	Sewage Treatment Facilities Service Unit (2019)	Establishment of, and subsequent updates thereto, sewage treatment facilities frontage and user charges.
512	Sewage Treatment Facilities Reserve Fund (2001)	Established a capital reserve fund for sewage treatment facilities.
608	Sewage Treatment Facilities Service Operating Reserve Fund (2007)	Established an operating reserve fund for sewage treatment facilities.

2. Description of Assets

The following sections outline the current state of the wastewater systems by providing answers to the following questions:

- What do we own?
- Where is it?
- What is its condition?
- What is its useful life?
- What is its value?

2.1. Treatment System

Primary treatment of the influent takes place in individual household septic tanks located on the residents' properties. Each property's grey water is individually pumped directly to the wastewater treatment property and to the community treatment tank.

The community treatment tank, which acts as secondary treatment, is an underground concrete septic tank located in west side of 12545 Greaves Road. There is a single outlet from the tank that splits in two directions, allowing the effluent to be diverted to two separate fields. The fields provide effluent disposal through a combined 215 m of perforated drainage pipe.

2.2. Collection System

There is currently no collection system in place on Greaves Road. A 50 mm pressurized line was originally proposed but never constructed.

There have been several issues with the privately installed lines that the SCRD has repaired over the years. In the Proposed Capital Budget section later in this plan, there is a recommendation to replace the collection system approximately ten years after the new treatment and disposal systems. This collection system would provide a reliable and safer service to the users.

2.3. Asset Accessibility

There are no accessibility concerns regarding the assets at Greaves Road.

2.4. Asset Condition

Wastewater treatment system condition was determined by staff based on several factors.

- Previous or immanent failure of the system;
- Frequency of system repairs;

- Age of system; and
- Ability to regularly meet effluent quality regulations

Based on these factors each system in the local service area was assigned a condition rating from excellent to poor. An excellent condition is assigned to systems in near new condition, good to systems with few minor defects, fair to systems with moderate defects or signs of aging, and poor to systems that cannot currently function as designed, or will soon cease functioning without repair, due to flow volumes, defects, or aging.

Based on the estimated useful life (EUL), the septic tank has approximately 16% of its lifespan remaining. The tank has not been pumped out since 2005 and therefore there is no recent inspection completed on the tank. A visual inspection of the tank during its next pump out will provide staff with a better understanding of its current condition and whether it may exceed its EUL. The treatment system is in fair condition.

A percolation test on the drainfield was conducted in 2019 to assess the condition of the perforated pipe (the test determines the water absorption rate at an exposed section of the pipe). While there has been no surface issues noted with the drainfield, it is now beyond its EUL and poses a concern for potential failure in the near future. The results of the percolation test revealed no issues with percolation over three of the runs tested, however there is root infiltration in the perforated drainage pipe nearest to the surrounding trees. The disposal system is in poor condition.

The existing service connections are in poor condition and need to be replaced with a reliable collection system.

2.5. Asset Replacement Value

It is expected that the treatment process that was installed 42 years ago will not be permitted once the community treatment tank is due for replacement. A replacement value was estimated based on the treatment and disposal systems at Canoe Road wastewater local service area.

At Canoe Road, influent is pumped to elevated treatment modules where it is processed through filter media and disposed of in a trenchless drainfield. This process was chosen for determining a replacement cost for Greaves Road based on a similar number of users and relatively low construction cost. However, to determine which treatment process is best suited for the conditions at Greaves Road wastewater local service, a feasibility study should be completed by a professional engineer.

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Installation cost for the collection system was estimated based on individual component installation values.

Table 2 – Asset Replacement Value Summary

Asset Type	Replacement Cost (2018 \$)	Year Installed	Estimated Useful Life	Remaining Useful Life
Treatment System	\$ 108,920	1977	50	8
Drainfield	N/A ¹	1977	40	-2 ²
Collection System	\$ 100,056	N/A ³	85	N/A

3. Operations & Maintenance (O&M) Plan

Operations and maintenance (O&M) are the activities that ensure the wastewater systems are able to continue to function as designed throughout their EUL. These activities include routine inspections and readings, unforeseen repairs, effluent sampling, and ongoing condition assessments. User fees and parcel taxes are collected annually to fund these activities.

As discussed in the Wastewater Service Review, the current fees and taxes are combined and can be used to fund the operational expenditures for the year. The recommendation in the Wastewater Service Review is for user fees to provide sufficient revenue for operational expenditures and for parcel taxes to be invested in capital renewal and replacement.

3.1. Current O&M Fees

The users of the Greaves Road wastewater local service are charged user fees of \$255.00 per year (including a 25% increase in user fees in 2019) and those properties within the service area boundary as outlined in Bylaw No. 1026 are charged \$102.00 in parcel tax per year (including a 2% parcel tax increase in 2019).

¹ The treatment system and drainfield have been assigned a single replacement cost. Both systems are anticipated to be replaced at the same and have the same estimated useful life.

² A negative Remaining Useful Life indicates that the asset has lasted longer than the expected norm. It is not necessarily directly related to asset condition or that the asset has failed.

³ Collection system installation date is still to be determined.

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3.2. Current O&M Budget

The budgeted and actual expenditures of the Greaves Road wastewater local service from 2015 to 2018 are shown in Table 3.

Table 3 – Budgeted and Actual Operations and Maintenance Expenditures

Expenditures	2015	2016	2017	2018	Average
Budget	\$ 1,501.00	\$ 1,439.00	\$ 1,326.00	\$ 1,399.00	\$ 1,416.25
Actual	\$ 371.00	\$ 503.00	\$ 4,679.00	\$ 628.93	\$ 1,545.48
Variance	\$ 1,130.00	\$ 936.00	\$ (3,353.00)	\$ 770.07	\$ (129.23)

Overall, the operations budget decreased by 7% between 2015 and 2018, while the actual expenditure increased by 70% during the same period of time. Regardless of the increase in expenditure, the actual expenditure remained significantly under budget in each year other than 2017. The majority of the actual expenditure (82%) was to pay for staffing expenses of operational and administrative staff.

The irregularity in this budget review, 2017, incurred costs 3.5 times the budgeted amount due to failures in the service connections on the west side of Greaves Road. Contracted services required to assist with the infrastructure repair accounted for almost half of the actual annual expenditures.

3.3. Potential O&M Budget

The potential O&M budget was created based on an optimal level of service for the systems at Greaves Road local service area. Similar to the existing O&M budget, staff wages account for the majority of the potential annual O&M budget for Greaves Road. The required monthly and annual tasks are primarily completed by a Utility Technician. Due to the relative simplicity of the infrastructure, the hours required to complete an optimal level of service are much less than treatment systems with mechanical equipment.

Significant expenses in the potential operating budget include:

- Staffing expenses, consisting of:
 - O&M staffing requirement;
 - Administration of the wastewater system by Utilities Services staff;
 - SCRD Administration Services contribution;

- Proportioned charges for non-annual contracted services; and
- Proportioned share of service vehicles, tools, and miscellaneous expenses.

Future replacement of the treatment system may result in an increased O&M budget. The treatment system mentioned in the Section 2.5 would increase the required O&M hours by as much as 140%. Other expenses relating to that type of treatment system include B.C. Hydro utility charges and scheduled filter media and equipment replacement.

With the inclusion of all ancillary charges, the potential operating budget for Greaves Road wastewater local service is \$2,000.00. The potential user fee for the five users in this service area is \$400.00, a 57% increase from 2019 rates. The separation of the property tax revenue from the operating budget is the primary contributing factor for the significant increase in user fees.

4. Capital Plan

Capital expenditure is required for the periodic renewal or replacement of wastewater systems or system components. A capital plan considers many of the topics already covered in this plan including asset replacement values and EULs, asset condition, and following a well-developed O&M plan.

The SCR D does not have a long-term capital funding plan in place for the wastewater infrastructure at Greaves Road.

4.1. Reserve Balances

As of the end of 2018, there was \$2,558.85 in capital reserves and \$7,622.21 contributed to operating reserves. Under the existing method of revenue collection and use, these reserves could be combined to invest in capital renewal or replacement projects if required.

There is currently no requirement for Greaves Road to have a set level, by either denomination or percentage, of reserves in place. Based on the current reserve balance and 2019 budget transfers, Greaves Road's reserves are 5% of the estimated replacement value of the infrastructure.

4.2. Potential Capital Budget

Budget models considering four different time frames (10, 20, 50, and 80 year periods) were prepared for consideration, each with varying impact on parcel tax

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and with different systems requiring replacement over the selected time frame. For each model two plans were prepared: a 10% parcel tax increase every five years, or a fixed parcel tax throughout the model time frame.

Each model factors in funding the full cost of the infrastructure requiring replacement within the life of the model. Any debt incurred during the timeframe of the model is paid off in full with interest and the model terminates with a reserve balance equal to 10% of the projected value of the infrastructure in the last year of the model.

The highlighted budget plans represent the model in which all infrastructure (i.e. the treatment, disposal, and collection systems) will be replaced.

Table 4 – Potential Capital Budget Options Based on Model and Payment Method

Capital Budget	Model	Infrastructure Replaced	Payment Method	Total Revenue	Parcel Tax (Year 1)
Plan 1	80-Year	Treatment System (2) Drainfield (2) Collection System (1)	Even Annual Contribution	\$ 1,625,200	\$ 3,386
Plan 2	80-Year	Treatment System (2) Drainfield (2) Collection System (1)	10% Increase Every Five Years	\$ 2,341,226	\$ 2,171
Plan 3	50-Year	Treatment System (1) Drainfield (1) Collection System (1)	Even Annual Contribution	\$ 627,750	\$ 2,093
Plan 4	50-Year	Treatment System (1) Drainfield (1) Collection System (1)	10% Increase Every Five Years	\$ 733,520	\$ 1,534
Plan 5	20-Year	Treatment System (1) Drainfield (1) Collection System (1)	Even Annual Contribution	\$ 376,900	\$ 3,141
Plan 6	20-Year	Treatment System (1) Drainfield (1) Collection System (1)	10% Increase Every Five Years	\$ 386,015	\$ 2,773
Plan 7	10-Year	Treatment System (1) Drainfield (1) Collection System (1)	Even Annual Contribution	\$ 310,650	\$ 5,178
Plan 8	10-Year	Treatment System (1) Drainfield (1) Collection System (1)	10% Increase Every Five Years	\$ 312,060	\$ 4,953

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In addition to the replacement of main wastewater systems, the capital budget also includes proportioned short-term debt payments for the purchase and replacement of two service vehicles.

As mentioned in Section 2.3, replacement costs and timing were based on the infrastructure recently constructed at Canoe Road. Different treatment and disposal systems may have different replacement times than noted in Table 4. For example, the proposed trenchless drainfield was assigned a longer EUL than a drainfield with perforated pipe. If a piped drainfield were to be installed it is assumed that, based on its EUL, it would need to be replaced in the 50-Year model, prior to the treatment system replacement.

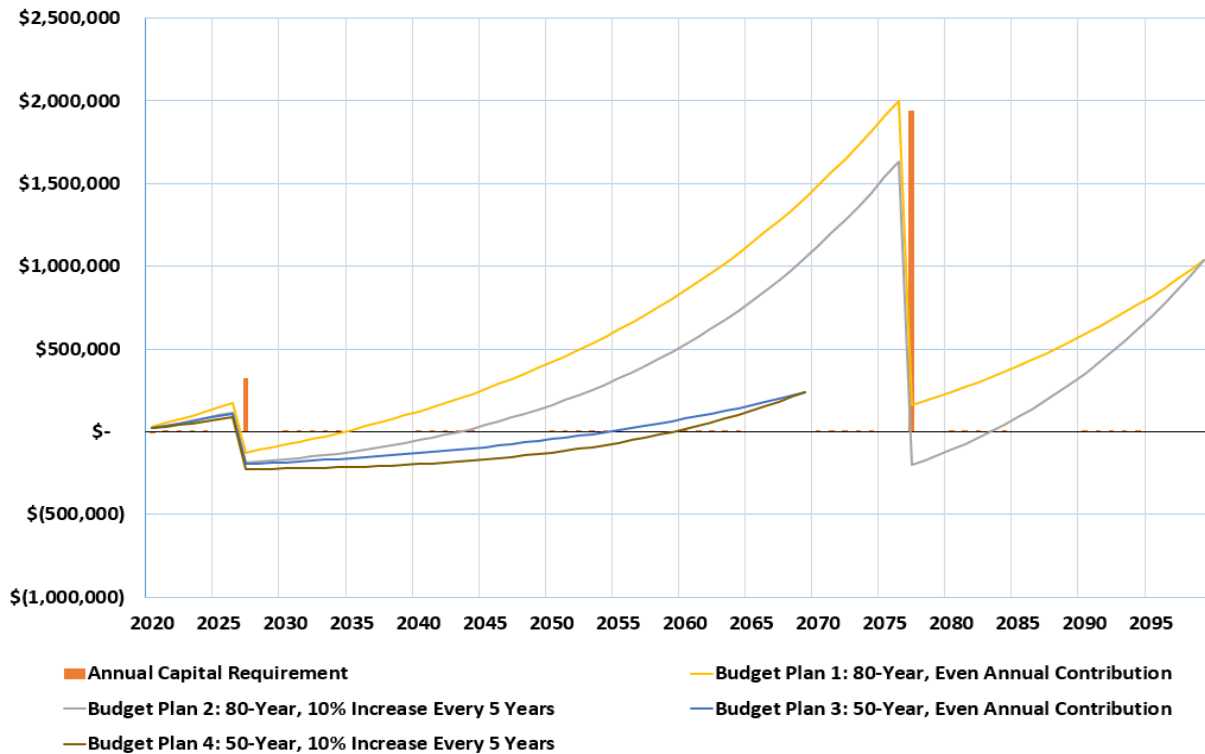


Figure 2 – Wastewater Local Service 50-Year and 80-Year Capital Plans

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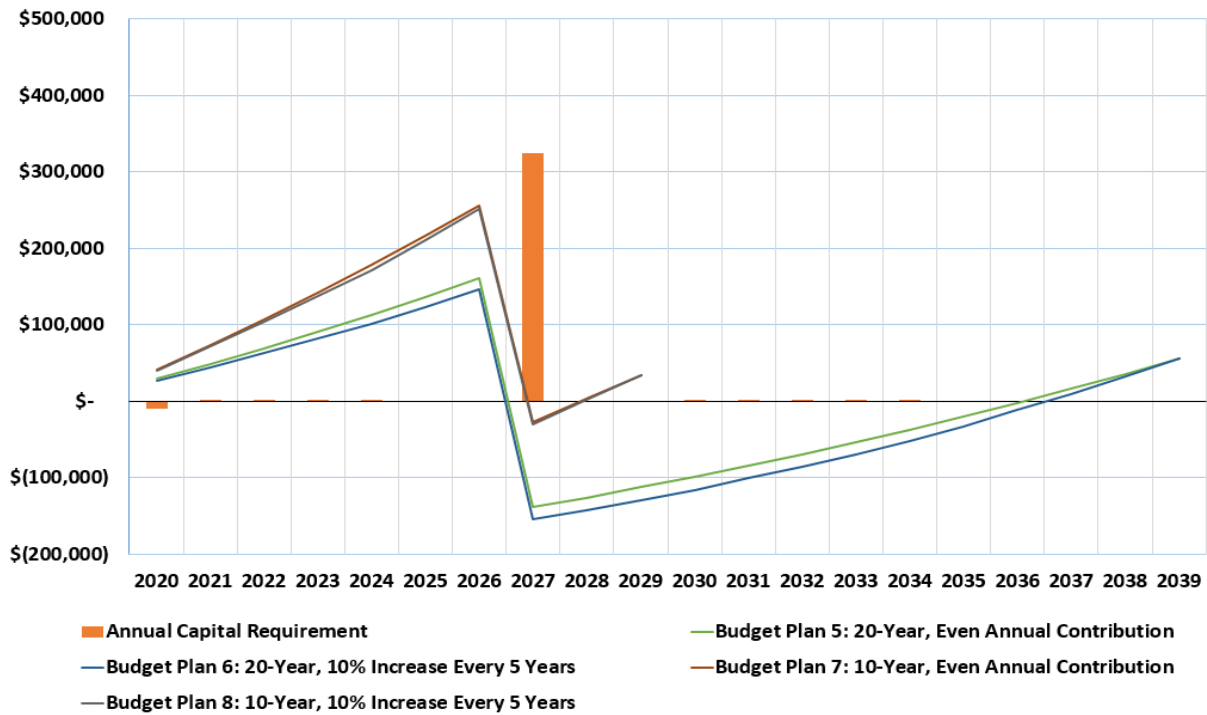


Figure 3 – Wastewater Local Service 10-Year and 20-Year Capital Plans

5. Additional Local Service Improvement Actions

Additional operational work is required in the Greaves Road wastewater local service area that falls outside of the typical operational and maintenance plan. These items have been listed due to the potential financial impact that they may have on the users and fronting properties of the local service.

Table 5 – Local Service Improvement Actions

Action Item	Target Year	Cost Estimate	Result
Engage consulting services to complete a feasibility study on potential options for treatment replacement.	2020	\$ 7,500	To be determined.
Review Bylaw No. 1026 to ensure fronting properties in the local service area have been correctly identified.	2020	Staff time to review.	To be determined.