



Making a difference...together

**HIGHLAND/FERNWOOD WATER SERVICE
HIGHLAND WATER SERVICE and FERNWOOD WATER SERVICE
2018 ANNUAL REPORT
April 17, 2019**

Introduction

This report provides a summary of the Highland/Fernwood Water Service for 2018. It includes a description of the service, summary of the water supply, demand and production, drinking water quality, operations highlights, capital project updates and financial report.

The AGM content in this report is for the combined Highland and Fernwood Water Utility. This utility has been operating as a combined entity since 2012; however, a joint commission has not been established at this time. A bylaw to formally establish the commission is in progress, but is not complete. Therefore, all discussions and motions are assumed to be independently supported by the Fernwood Water Service Commission and the Highland Water and Sewer Service Commission unless specifically indicated otherwise. For the purpose of this report, the term Commission refers to the Fernwood Water Service Commission and the Highland Water and Sewer Service Commission working together as a single commission.

Service Description

The Highland/Fernwood Water Service is a semi-rural residential community located on Salt Spring Island and includes servicing Fernwood Elementary School.

The Highland service was first developed in the 1970's under the name Vesuvius Holdings and was converted to the Highland Water System in 1978. It then became a CRD service in 2004.

The Fernwood service was created in the 1970's by a private developer and was converted to the Fernwood Improvement Water District in 1984. It then became a CRD service in 1989.

Water service to Highland and Maliview are administered by the Highland Water and Sewer Local Services Commission and water service to Fernwood is administered by the Fernwood Water Local Service Commission. The intent is to establish a single commission to administer the merged service, but this has not been completed at the end of 2018 and is now scheduled to be done in 2019.

Previously, the two water services operated on separate treatment and distribution systems both drawing water from St. Mary Lake. As of mid-September 2012, both service areas are supplied through a single water treatment plant and interconnected distribution systems. A new operating budget was established in 2013 to accommodate the single treatment plant and combined distribution systems.

The Highland/Fernwood Water Service (Figure 1) is comprised of 333 parcels of land with 320 of those parcels connected to the service.

The service obtains its drinking water from St. Mary Lake, which lies within an uncontrolled multi-use watershed. The Capital Regional District (CRD) holds five licenses to divert a total of up to 230,000 m³ per year and store up to 30,800 m³. St. Mary Lake is subject to seasonal water quality changes and is affected by periodic algae blooms.

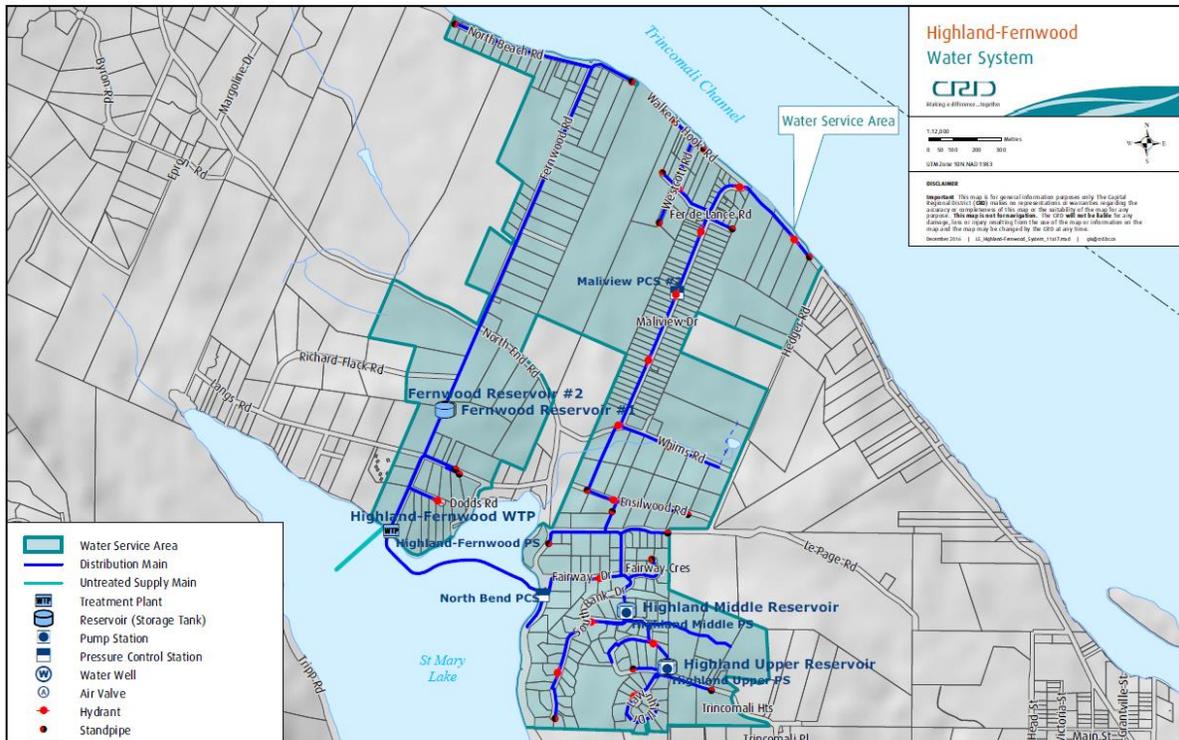


Figure 1: Highland/Fernwood Water Service

The Highland/Fernwood water system is primarily comprised of:

- a water treatment plant (WTP) that draws water from St. Mary Lake and treats it at a location on Maycock Road, adjacent to the lake. The water is treated using a rapid mix system, flocculation, dissolved air floatation (DAF) and filters, ultraviolet disinfection, then chlorination prior to being pumped, via the distribution system to two different reservoirs. The WTP design flow rate is 11.3 l/sec (150 l/gpm);
- one raw water pump station on Maycock Road, adjacent to the lake. (flow rate of two pumps running is 4.6 l/sec (60 l/gpm);
- approximately 12,000 m of water distribution pipe;
- 4 water reservoirs – one 180 m³ (40,000 lg) on the Highland system, one 91 m³ (20,000 lg) on the Highland system, one 45 m³ (10,000 lg) on the Fernwood system and, one 91 m³ (20,000 lg) on the Fernwood system;
- 2 water system booster pumps – on Highland system, 1 at each reservoir;
- fire hydrants, standpipes, and gate valves;

- water service connections complete with water meters;
- 2 pressure reducing valve stations - one on North End Road and one on Maliview Drive.

Water Production and Demand

Referring to Figure 2, 85,659 cubic meters (m³) of water was extracted (water production) from St. Marys Lake in 2018; less than 1% decrease from the previous year and is 8% more than the five year average. Water demand (customer water billing) for the service totalled 51,059 m³ of water; a 2% decrease from the previous year and a 6% decrease from the five year average.

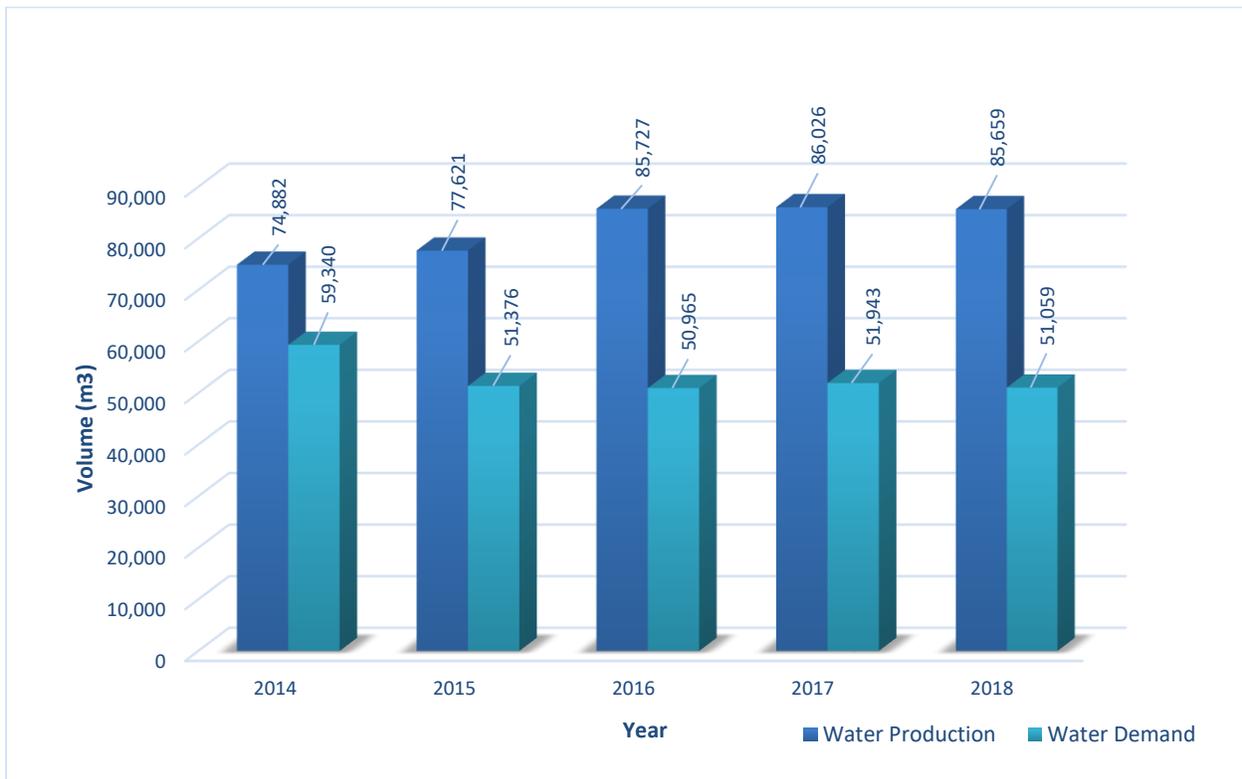


Figure 2: Highland/Fernwood Water Service Annual Water Production and Demand

Water production by month for the past five years is shown in Figure 3. As with most water systems, water consumption is greatest during the summer months. However, the 2018 water production data information does not depict this type of trending. This is primarily the result of significant water system leaks that influence and skew monthly production data.

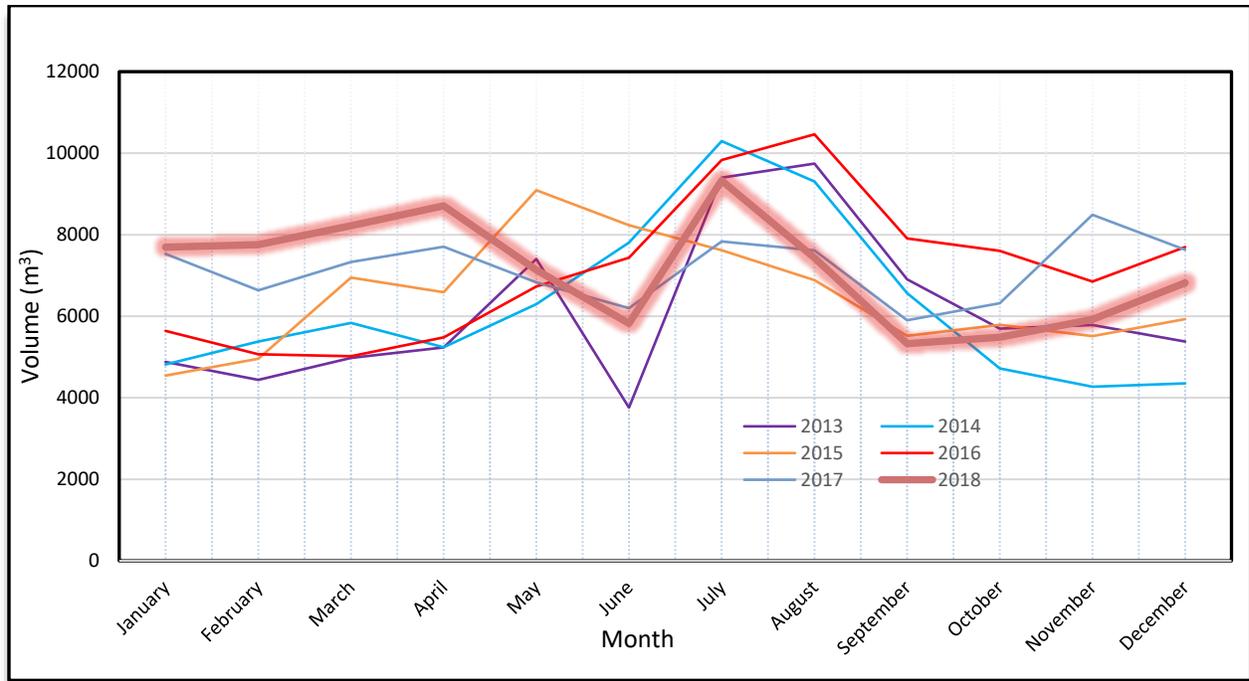


Figure 3: Highlands Water Service Monthly Water Production

The Highland/Fernwood Water System is fully metered, and water meters are read quarterly. Water meters are manually read on a quarterly basis and the data enables water production and consumption to be compared in order to estimate leakage losses in the distribution system. The difference between water produced and water demand (total metered consumption) is called non-revenue water and includes distribution leaks, meter error, and unmetered uses such as fire hydrant usage, distribution system maintenance, and process water for the treatment plant. Non-revenue water is approximately 40%. Water loss is estimated to be approximately 35% which is considered high for a small water system such as Highland/Fernwood.

Water Quality

In 2018, the analytical results (biological, chemical and physical parameters) of water samples collected from the Highland/Fernwood Water Systems indicated that the drinking water supplied to the customers was generally of good quality. The Canadian Drinking Water Quality Guideline (GCDWQ) limit for turbidity of 1 nephelometric turbidity unit (NTU) was exceeded on a number of occasions throughout the year at a few sampling stations in the Highland Distribution System that are characterized as low flow locations. A regular distribution pipe flushing program should address this issue. Staff observed significant algal events, including an ongoing cyanobacteria bloom in St. Mary Lake which finally disappeared in October. During these events, the Highland/Fernwood water treatment plant has been able to produce safe and good quality drinking water.

The data below provides a summary of the water quality characteristics in 2018:

Raw Water:

- The raw water exhibited typically low concentrations of total coliform and *E. coli* bacteria throughout the cold weather periods and higher spikes during the summer.
- *Giardia* parasites were detected in very low concentrations in May, but no *Cryptosporidium* parasites.
- The analyses of raw water samples indicated low concentrations of iron and but higher concentrations of manganese in the winter (December).
- The raw water was slightly hard (median hardness 37.5 mg/L CaCO₃).
- The raw water turbidity (cloudiness) was near 1 NTU during most months but well over 1 NTU between June and September. Highest raw water turbidity was registered in September with 4.0 NTU. This was as a result of algal activity.
- A mean annual total organic carbon (TOC) concentration of 3.75 mg/L confirms the mesotrophic (semi-productive) to eutrophic (productive) status of St. Mary Lake.
- The long-lasting cyanobacteria bloom in St Mary Lake finally subsided in late October 2018. Despite the bloom, no cyanotoxins were detected in the raw water entering the treatment plant in 2018.

Treated Water:

- The treated water was safe to drink; no indicator bacteria were detected in any sample throughout the year.
- The treated water turbidity was typically well below the turbidity limit of 1.0 NTU throughout the year in most parts of the system. However, Standpipe #19 in the Highland Distribution System exceeded 1 NTU regularly during the summer but never exceeded 2.1 NTU. Also Standpipe #8 in the Highland Distribution System exhibited elevated turbidity of up to 3.6 NTU during the summer. The Fernwood Distribution System sampling station at the end of North Beach Road, which historically exceeded 1 NTU on a regular basis, had in 2018 a turbidity consistently below 1 NTU. This was a result of main flushing conducted in the Fernwood Distribution System. Similar improvements could also be expected in the Highland Distribution System if a water main flushing program was to be implemented there.
- The levels of disinfection by-products (THM) across the Fernwood and the Highland Distribution System were well below the 100 µg/L limit in the GCDWQ. Haloacetic acids (HAA) were not tested in 2018 due to a history of concentrations consistently well below the GCDWQ limit of 80 µg/L.
- The treated water TOC in both distribution systems was lower than in previous years, ranging from 1.3 to 2.1 mg/L in the Fernwood Distribution System, and 1.27 to 2.46 mg/L in the Highland Distribution System. There is currently no guideline in the GCDWQ for TOC levels, however the USEPA suggests a treated water TOC concentration of < 2 mg/L as confirmation of effective treatment and disinfection by-product control.
- Elevated iron and/or manganese concentrations, which can lead to water discolouration, have been below the aesthetic guideline limits throughout both distribution systems. Especially the Fernwood Distribution System had much reduced iron and manganese concentrations as a result of the water main flushing in 2018.

Water Quality data collected from these two distribution systems can be reviewed on the following CRD website:

<https://www.crd.bc.ca/about/data/drinking-water-quality-reports>

Operational Highlights

CRD's Integrated Water Services, Saanich Peninsula and Gulf Island Operations, is responsible for the day to day operations of the water system. Salt Spring Island based operations staff perform regular weekly routine operational visits to several locations including the water treatment facility, reservoirs and various water distribution system sites to ensure the water system is functioning properly. Additional support is provided by Peninsula Operations staff including the electrical and mechanical maintenance groups as required. The list below highlights some of the operations during 2018:

- Emergency leak repairs Trincomali Upper Reservoir
- Emergency water distribution system multiple leak detection responses.
- Water service leak repair 264 Maliview.
- Water service leak repair 184 Maliview
- Water system leak repair North End Rd and Fairway Drive
- Water system leak repair 110 Southbank
- Water system leak repair 226 Southbank
- Water system leak repair near Trincomali Middle Reservoir.
- Raw water intake pump repair.
- Respond to Dec 20th wind storm event

CAPITAL IMPROVEMENTS

Highland/Fernwood Water Capital

There was one capital project planned for 2018:

1. Undertake Intake Assessment and Design – (\$20,000 allocated, \$0 spent). Current intake is undersized, therefore limiting the treatment plant capacity. The intake has also experienced significant algae growth on the screen requiring emergency maintenance. This work is to complete an assessment of the intake, confirm the anticipated construction costs, complete the design for construction and complete any required permits. The design work has been started, but is on hold until staff resources become available. The actual construction isn't anticipated until the 2019 budget is approved. The work may be carried forward to 2020.

Highland Water Capital

There were five capital projects planned for 2018:

1. Infrastructure Upgrades - \$173,623 allocated (\$80,000 for 2018, \$93,623 for 2019). These upgrades were divided into four projects:
 - 1.1. Highlands Middle Reservoir repairs (\$80,000 allocated \$486 spent): Work did not advance in 2018. Need to consider re-prioritizing funding for the Highland Middle Reservoir to the Highland Upper Reservoir.
 - 1.2. Demolition of abandoned Highlands Treatment Plant (\$35,000 allocated \$5,635 spent): Operations has completed the disconnection from the old water system. Work to demolish the building is still planned. A hazardous material assessment has been completed. Environmental impact abatement plan will be required due to proximity to St. Mary's Lake.
 - 1.3. Repair Failed Standpipes (\$45,000 allocated, \$33,626 spent): Work completed to repair 8 standpipes.
 - 1.4. Failing Water Service Repairs (\$13,623 allocated \$11,546 spent): Water services are being repaired/replaced as they fail. Project budget is almost spent.
2. Asset Management Plan (\$20,000 allocated, \$14,288 spent): Identify condition of assets, develop prioritized list of infrastructure replacement. This work was started in 2018, and should be completed in 2019.

Fernwood Water Capital

There was one capital project planned for 2018:

1. Fernwood Asset Management Plan – (\$5,000 allocated, \$3,074 spent). Identify condition of assets, develop prioritized list of infrastructure replacement. This work was started in 2018, and should be completed in 2019.

2018 FINANCIAL REPORT

Please refer to the attached *Statement of Operations*. Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), consumption based revenue (*Water Sales*), interest on savings (Interest Earnings), a transfer from the maintenance reserve account, and miscellaneous revenue such as late payment charges (Other Revenue).

Expenses includes all costs of providing the service. General Government Services includes budget preparation, financial management, utility billing and risk management services. CRD Labour and Operating Costs includes CRD staff time as well as the costs of equipment, tools and vehicles. Debt servicing costs are interest and principal payments on long term debt. Other Expenses includes all other costs to administer and operate the water system, including insurance, supplies, water testing and electricity.

The difference between Revenue and Expenses is reported as Net Revenue (expenses). Any transfers to or from capital or reserve accounts for the service (Transfers to Own Funds) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit) that is carried forward to the following year.

Highland/Fernwood Water

2018 User Fee charges were \$858.15 per Single Family Equivalent (SFE) and 2018 Parcel Tax charges were \$173.84 per Taxable Parcel.

The balances in the Highland / Fernwood Water service capital funds and reserve accounts at December 31, 2018 were:

Description	Balance at end of 2018
Operating Reserve Fund	\$28,840
Capital Reserve Fund	\$103,201

Highland Water

2018 Parcel Tax charges were \$154.27per Taxable Parcel.

The balances in the Highland Water service capital funds at December 31, 2018 were:

Description	Balance at end of 2018
Funds remaining to spend on projects in progress (WLA3580)	\$122,506
Funds remaining to spend on projects in progress (WSV185099)	\$9,429

Fernwood Water

2018 Parcel Tax charges were \$257.80 per Taxable Parcel.

The balances in the Fernwood Water service capital fund at December 31, 2018 were:

Description	Balance at end of 2018
Funds remaining to spend on projects in progress (WSV185147)	\$2,365

Water System Problems - Who to Call:

To report any event or to leave a message regarding the Highland/Fernwood Water System, call either:

CRD water system emergency call centre: 1-855-822-4426 (toll free)
CRD water system emergency call centre: 1-250-474-9630 (toll)
CRD local operator (Ganges Wastewater Treatment Plant): 250-537-4314
CRD water system general enquiries (toll free): 1-800-663-4425

When phoning with respect to an emergency, please specify to the operator, the service area in which the emergency has occurred.

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Attachment: Statement of Operations

CAPITAL REGIONAL DISTRICT

HIGHLAND WATER Statement of Operations (Unaudited) For the Year Ended December 31, 2018

	2018	2017
Revenue		
Transfers from government	37,230	37,137
Other revenue from own sources:		
Interest earnings	78	51
Other revenue	109	96
Total revenue	<u>37,417</u>	<u>37,284</u>
Expenses		
General government services	1,820	1,720
Debt Servicing Costs	35,567	35,554
Total expenses	<u>37,387</u>	<u>37,274</u>
Net revenue (expenses)	29	10
Annual surplus (deficit)	29	10
Accumulated surplus (deficit), beginning of year	53	44
Accumulated surplus (deficit), end of year	<u>\$ 83</u>	<u>53</u>

CAPITAL REGIONAL DISTRICT

HIGHLAND / FERNWOOD WATER Statement of Operations (Unaudited) For the Year Ended December 31, 2018

	2018	2017
Revenue		
Transfers from government	55,000	55,000
User Charges	274,897	260,787
Sale - Water	75,693	62,344
Other revenue from own sources:		
Interest earnings	11	32
Other revenue	1,251	1,064
Transfer from Operating Reserve Account	36,277	-
Total revenue	<u>443,129</u>	<u>379,226</u>
Expenses		
General government services	16,350	15,410
Contract for Services	30,570	29,539
CRD Labour and Operating costs	209,283	150,359
Debt Servicing Costs	41,389	41,337
Other expenses	113,057	77,047
Total expenses	<u>410,649</u>	<u>313,692</u>
Net revenue (expenses)	32,480	65,534
Transfers to own funds:		
Capital Reserve Fund	-	8,810
Operating Reserve Fund	32,480	24,028
Annual surplus (deficit)	-	32,696
Accumulated deficit, beginning of year	-	(32,696)
Accumulated deficit, end of year	<u>\$ -</u>	<u>-</u>

CAPITAL REGIONAL DISTRICT

HIGHLAND / FERNWOOD WATER Statement of Reserve Balances (Unaudited) For the Year Ended December 31, 2018

	Capital Reserve	
	2018	2017
Beginning Balance	97,553	99,036
Transfer from Operating Budget	-	8,810
Transfers from completed capital projects	-	975
Interest Income	5,648	3,348
Transfer to Capital Project	-	(14,616)
Ending Balance	<u>103,201</u>	<u>97,553</u>

	Operating Reserve	
	2018	2017
Beginning Balance	31,425	6,983
Transfer from/(to) Operating Budget	(3,797)	24,028
Interest Income	1,212	414
Ending Balance	<u>28,840</u>	<u>31,425</u>

CAPITAL REGIONAL DISTRICT

FERNWOOD WATER Statement of Operations (Unaudited) For the Year Ended December 31, 2018

	2018	2017
Revenue		
Transfers from government	19,350	19,250
Other revenue from own sources:		
Interest earnings	36	24
Other revenue	53	47
Total revenue	<u>19,439</u>	<u>19,321</u>
Expenses		
General government services	1,720	1,620
Debt Servicing Costs	<u>17,702</u>	<u>17,696</u>
Total expenses	<u>19,422</u>	<u>19,316</u>
Net revenue (expenses)	18	5
Annual surplus (deficit)	18	5
Accumulated surplus, beginning of year	26	21
Accumulated surplus, end of year	<u>\$ 43</u>	<u>26</u>