# Sticks Allison Water System

2019 Annual Report

CRD | Drinking Water

## Introduction

This report provides a summary of the Sticks Allison Water Service for 2019 and 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.

## Service Description

The community of Sticks Allison is a rural residential development located on the north side of Galiano Island in the Southern Gulf Islands Electoral Area which was originally serviced by a private water utility. In 1996 the service converted to the Capital Regional District. The Sticks Allison water service (Figure 1) is made up of 39 parcels encompassing a total area of approximately 23 hectares. Of the 39 parcels, 35 were customers to the water system in 2019.

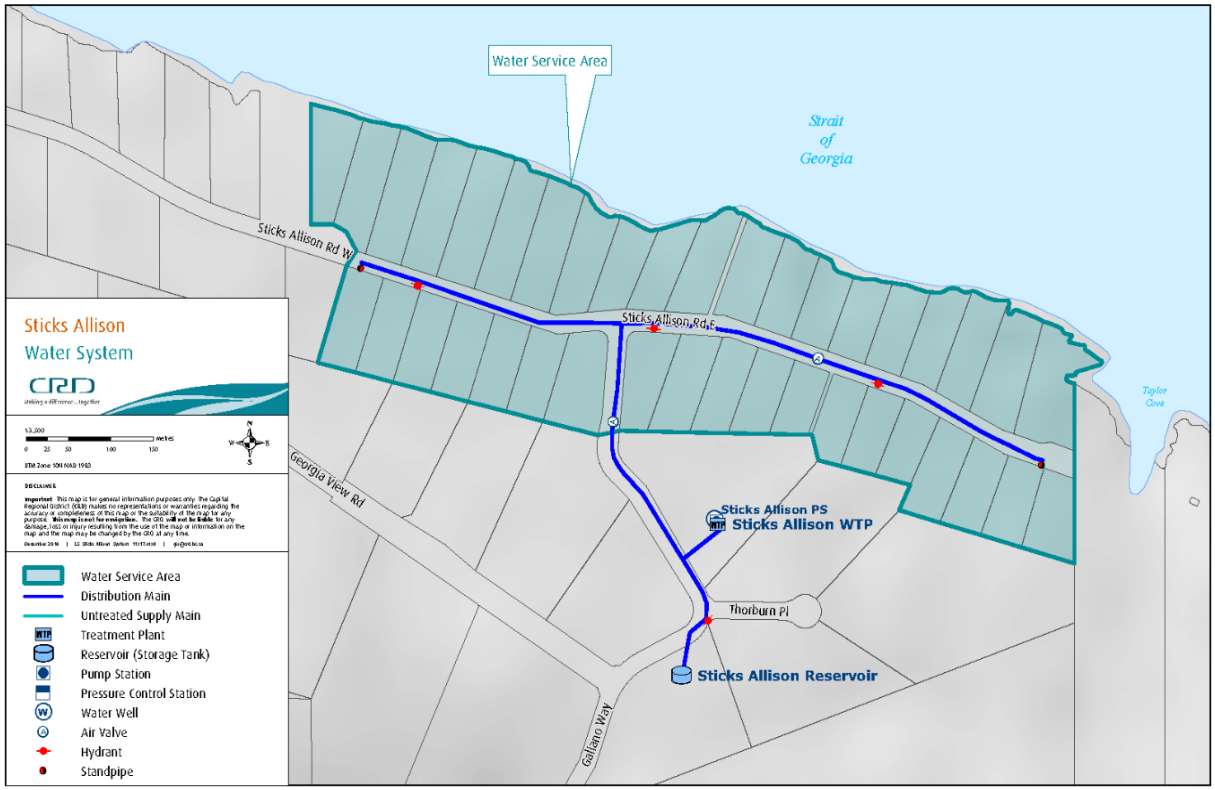


*Figure 1: Map of Sticks Allison Water System.*

The Sticks Allison water system is primarily comprised of:

- One ground water well, related pumping and control equipment and building.
- Disinfection process equipment (ultraviolet light and chlorine).
- One steel storage tank (total volume is 90 cubic metres).
- Distribution system (1,400 metres of water mains).
- Other water system assets: 35 service connections and meters, 4 hydrants, 2 standpipes, 10 gate valves, SCADA system and auxiliary generator.

## Water Supply

Referring to Figure 2 below, groundwater supply monthly water levels are highlighted for 2019. Groundwater levels for the most part during 2019 are within the typical historical range. However, aquifer water levels in July through September were historically low but did recover towards the end of the year. A dry summer and marginally higher consumption during the period are likely contributing factors.

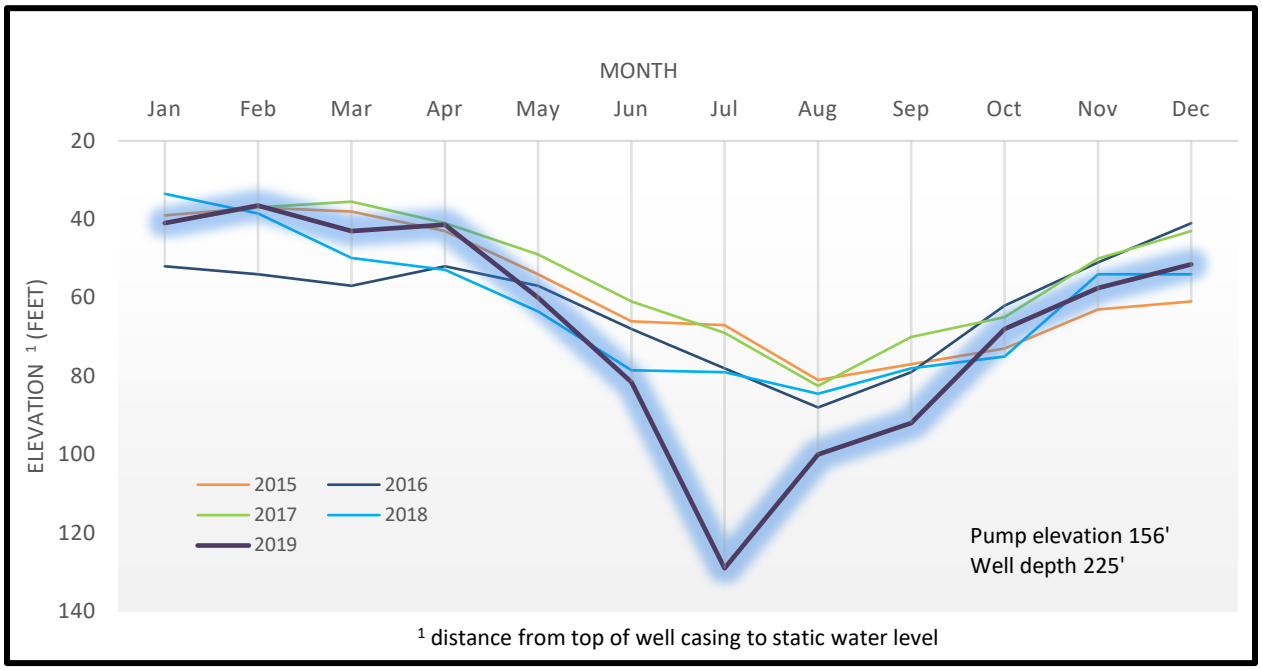


***Figure 2: Sticks Allison Monthly Groundwater Water Level***

## Water Production and Demand

Referring to Figure 3, 6,489 cubic meters of water were extracted (water production) from the ground water source in 2019. This was a 4% increase from the previous year and an 8% increase from the five year average. Water demand (customer water billing) for the service totaled 5,869 cubic meters of water; a 4% increase from the previous year and an 8% increase from the five year average.

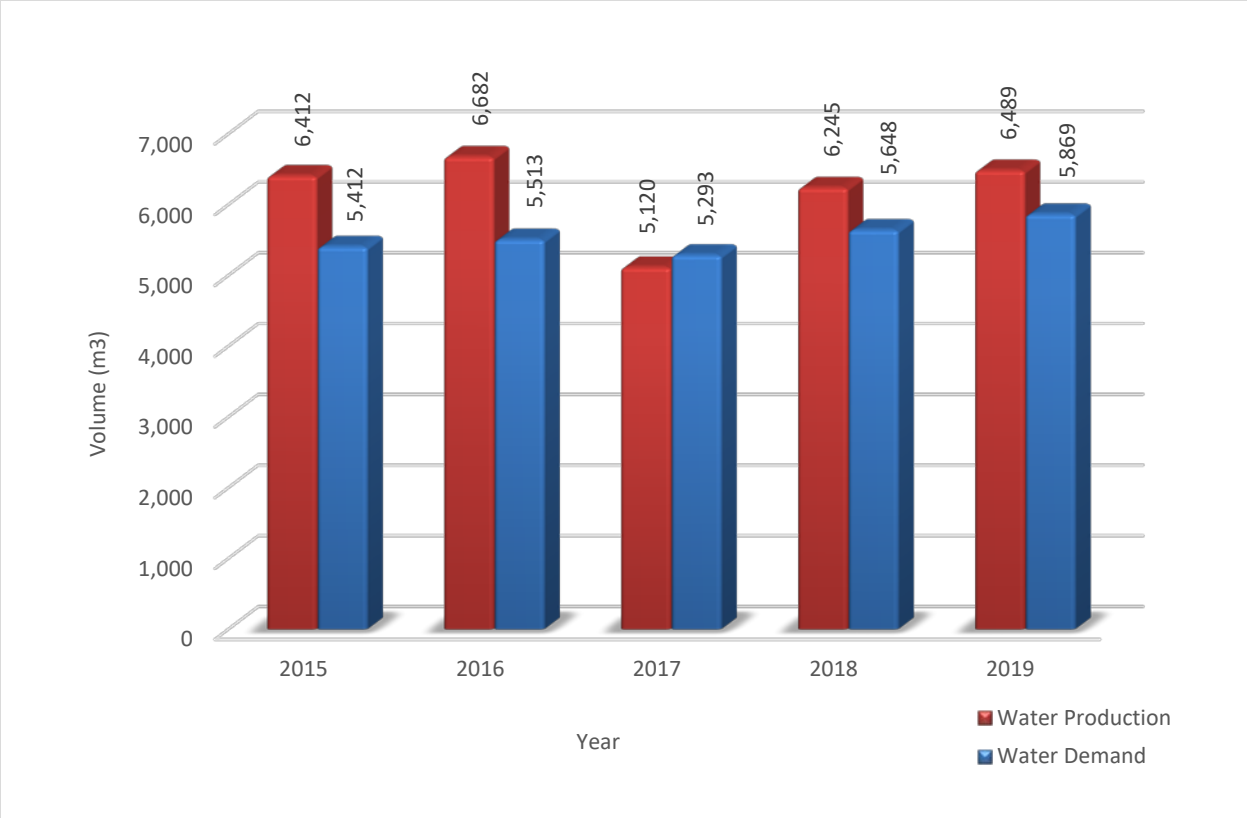


***Figure 3: Stick Allison Water Service Annual Water Production and Demand.***

The difference between annual water production and annual water demand is referred to as non-revenue water and can include water system leaks, water system maintenance and operational use (e.g. water main flushing, filter system backwashing), potential unauthorized use and fire-fighting use.

The 2019 non-revenue water (620 cubic meters) represents approximately 10% of the total water production for the service area. However, approximately 80 cubic meters can be attributed to operational use resulting in a non-revenue water volume of approximately 8%. This is considered to be acceptable of a small water system.

Figure 4 below illustrates the monthly water production for 2019 along with the historical water production information. The monthly water production trends are typical for small water systems such as the Sticks Allison water system.

From this chart it is important to highlight that water production during August through October in 2019 is higher than typical trending. Messaging to the Community in late August about historically low aquifer water levels and the need to conserve water to avoid trucking in water may not have been as successful as anticipated.

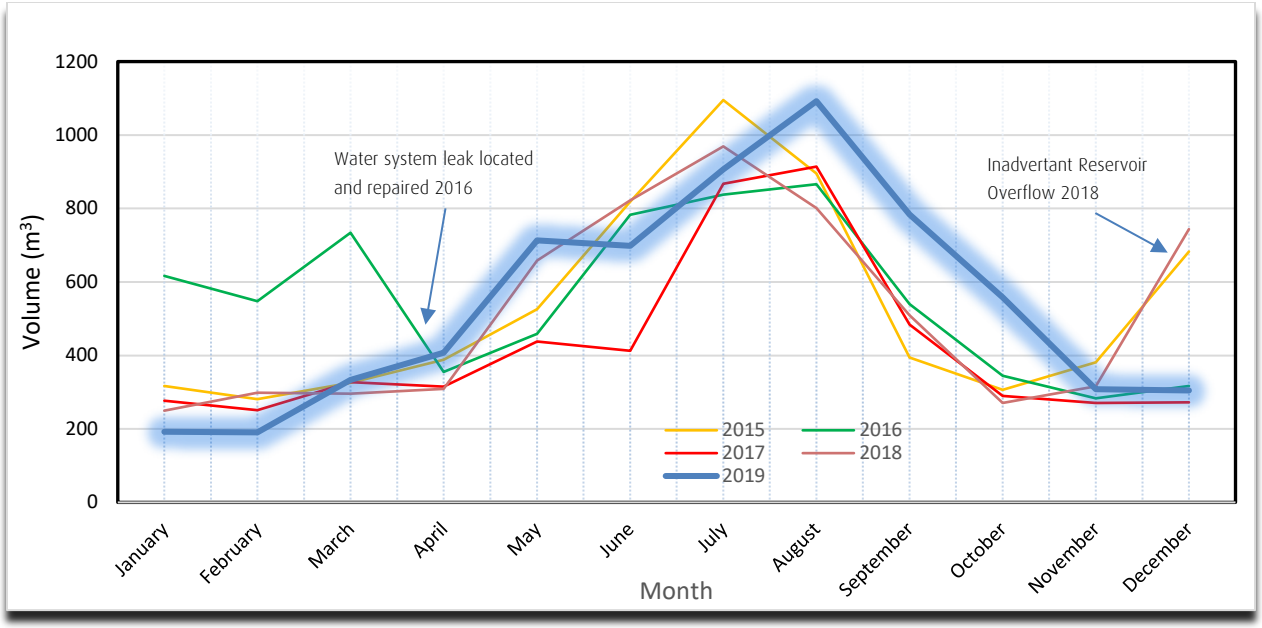


***Figure 4: Sticks Allison Water Service Monthly Water Production.***

## Drinking Water Quality

Staff completed the water quality monitoring program at Sticks Allison based on the regulatory requirements and system specific risks. Samples were collected at regular frequencies from the raw water as well as from a number of sampling stations at the treatment plant and in the distribution system. The samples were shipped for various analyses to CRD's Water Quality Lab or to external laboratories for special analyses, including disinfection by-products or metals.

The water system performed well in 2019 and consistently supplied drinking water of good quality to its customers. The groundwater well produced generally good quality source water with the exception of elevated iron and manganese concentrations at the systems ends due to high water age and accumulation. This can lead to brown/yellow water discoloration and become a nuisance for customers. High manganese concentrations in excess of the limits in the Guidelines for Canadian Drinking Water Quality have now been also associated with possible health implications.

The data below provides a summary of the water quality characteristics in 2019:

Raw Water:

- The Sticks Allison well produced raw water that contained no *E. coli* bacteria and almost no total coliform bacteria (2 sample had very low total coliform concentrations).
- The raw water had a median manganese concentrations of 23.5 µg/L which is slightly above the aesthetic objectives in the Guidelines for Canadian Drinking Water Quality. Iron concentrations were also elevated by below the aesthetic objective. However, iron and manganese concentrations do build up at locations of high water age such as dead end pipe sections with little water demand and then lead to exceedances with coloured water implications for the customers nearby. This will be mitigated by regular spot flushing to reduce water age and accumulation of particles and metals.

- The raw well water has a median pH of 8.25 and is soft with a median hardness of 27.8 mg/L ($CaCO_3$)
- The raw water turbidity was consistently under 1 NTU with an annual median of 0.2 NTU.

Treated Water:

- The treated water was safe to drink with no confirmed *E. coli* or total coliform bacteria concentrations. One total coliform positive result in the system on December 19, 2019 was not confirmed by a subsequent resample.
- The treated water turbidity was low with a median of 0.35 NTU.
- The iron and manganese concentrations in the distribution system were generally below the aesthetic limits according to the Guidelines for Canadian Drinking Water Quality but regularly exceeded the limits at the east end of Sticks Allison Road. It is expected that the west end of Sticks Allison Road experienced similar concentrations but this was not tested. No customer complaints were received. However, periodic flushing of standpipes at the far ends of the system would ensure that elevated iron and manganese concentrations do not accumulate in the pipes and reach levels in exceedance of the guidelines limits. Regular flushing routines have been coordinated with Operations.
- The annual average levels of the disinfection by-product total trihalomethanes were well below the maximum allowable concentration.
- The free chlorine residual concentrations in the distribution system ranged from 0.04 to 1.64 mg/L with a median of 0.37 mg/L indicating sufficient secondary disinfection.

Water quality data collected from this drinking water system can be reviewed on the CRD website:

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

## Operational Highlights

The following is a summary of the major operational issues that were addressed by CRD Integrated Water Services staff:

- Chlorine analyser probe failure replacement.
- Reservoir wireless communications equipment replacement.
- Leak detection efforts in response to higher water production and low aquifer water levels (August)

## Water Service Capital Project Updates

The Capital Projects updates for 2019 includes:

- Condition Assessment – The project has been started and will be completed by CRD staff in 2020.
- New Chlorine Analyzer – A new chlorine analyzer was procured and installed by CRD staff in 2019.

## Financial Report

Please refer to the attached Statement of Operations. Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), 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.

| | |
|---|---|
| Submitted by: | Matt McCrank, M.Sc., P.Eng., Senior Manager, Infrastructure Operations |
| | Ian Jesney, P.Eng., Senior Manager, Infrastructure Engineering |
| | Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection |
| | Rianna Lachance, BCom, CPA, CA, Senior Manager, Financial Services |
| Concurrence | Ted Robbins, BSc, C.Tech, General Manager, Integrated Water Services |

Attachment: 2019 Financial Summary (Statement of Operations)

## CAPITAL REGIONAL DISTRICT

### STICKS ALLISON WATER
### Statement of Operations (Unaudited)
### For the Year Ended December 31, 2019

| | | 2019 | 2018 |
|---|---|---|---|
| **Revenue** | | | |
| Transfers from government | | 5,000 | 5,000 |
| User Charges | | 45,591 | 43,345 |
| Other revenue from own sources: | | | |
| Interest earnings | | - | 102 |
| Other revenue | | 1,404 | 1,001 |
| Transfer from Operating Reserve | | 10,000 | 1,317 |
| Total Revenue | | 61,995 | 50,765 |
| **Expenses** | | | |
| General government services | | 2,356 | 2,465 |
| CRD Labour and Operating costs | | 42,666 | 38,503 |
| Debt Servicing Costs | | - | - |
| Other expenses | | 13,768 | 6,797 |
| Total Expenses | | 58,790 | 47,765 |
| **Net revenue (expenses)** | | 3,205 | 3,000 |
| Transfers to own funds: | | | |
| Capital Reserve Fund | | - | - |
| Operating Reserve Fund | | 3,205 | 3,000 |
| **Annual surplus (deficit)** | | - | - |
| Accumulated surplus, beginning of year | | - | - |
| **Accumulated surplus, end of year** | $ | - | - |

## CAPITAL REGIONAL DISTRICT

### STICKS ALLISON WATER
### Statement of Reserve Balances (Unaudited)
### For the Year Ended December 31, 2019

| | Capital Reserve | |
|---|---|---|
| | **2019** | **2018** |
| **Beginning Balance** | 16,839 | 14,420 |
| Transfer from Operating Budget | - | - |
| Transfers from completed capital projects | 83 | 2,067 |
| Interest Income | 266 | 352 |
| Transfer to Capital Projects | (14,500) | - |
| **Ending Balance** | 2,688 | 16,839 |

| | Operating Reserve | |
|---|---|---|
| | **2019** | **2018** |
| **Beginning Balance** | 7,873 | 6,004 |
| Transfer from Operating Budget | 3,205 | 3,000 |
| Transfer to Operating Budget | (10,000) | (1,317) |
| Interest Income | 221 | 186 |
| **Ending Balance** | 1,299 | 7,873 |