Alberni-Clayoquot Regional District

BEAVER CREEK WATER COMMITTEE MEETING
TUESDAY JULY 16, 2019, 2:00PM

Regional District Board Room, 3008 Fifth Avenue, Port Alberni, BC

AGENDA

PAGE #

1. CALL TO ORDER

Recognition of Territories.

2. APPROVAL OF AGENDA

THAT the Beaver Creek Advisory Committee approve the agenda as circulate.

3. ADOPTION OF MINUTES

a. Beaver Creek Water Advisory Committee Meeting held January 24, 2019. **3-5**

THAT the minutes of the Beaver Creek Advisory Committee meeting held on January 24, 2019 be adopted.

4. REQUEST FOR DECISIONS & BYLAWS

a. **REQUEST FOR DECISION**
Update Leak Policy to include Maximum Overage Charges **6-10**

THAT the Beaver Creek Water Advisory Committee recommend to the ACRD Board of Directos that the leak policy be updated to include a maximum overage charge of $1,500.

5. REPORTS

a. Beaver Creek Annual Report. **11-23**

THAT the Beaver Creek Advisory Committee receives the 2019 Beaver Creek Annual Report.

6. LATE BUSINESS
(requires 2/3 majority vote)

7. IN CAMERA

Motion to close the meeting to the public as per the Community Charter, sections:

90 (1) (K) negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public

8. <u>ADJOURN</u>

Alberni-Clayoquot Regional District

MINUTES OF THE BEAVER CREEK WATER ADVISORY COMMITTEE MEETING HELD ON THURSDAY, JANUARY 24, 2019, 3:30 PM

Regional District Board Room, 3008 Fifth Avenue, Port Alberni, BC

MEMBERS PRESENT: John McNabb, Chairperson, Director, Electoral Area "E" (Beaver Creek)
Patty Edwards
Gord Blakey
Harold Carlson
Dwight Nass

STAFF PRESENT: Teri Fong, Manager of Finance
Tricia Bryant, Asset Management Coordinator
Jenny Brunn, Manager of Operations
Douglas Holmes, CAO
Julia Martin, Administrative Assistant

REGRETS: Pam Craig

1. CALL TO ORDER

The Chairperson called the meeting to order at 3:30 pm.

The Chairperson recognized the meeting this afternoon is being held in the Tseshaht First Nation and the Hupacasath First Nation Territories.

2. APPROVAL OF AGENDA

MOVED: *G. Blakey*
SECONDED: *H. Carlson*

THAT the agenda be approved as circulated with the addition of item ***6.a. Water Sampling at the end of Willow Road.***

CARRIED

3. ADOPTION OF MINUTES

a. **Beaver Creek Water Advisory Committee Meeting held January 31, 2018**

MOVED: *H. Carlson*
SECONDED: *G. Blakey*

THAT the minutes of the Beaver Creek Water Advisory Committee meeting held on January 31, 2018 be received.

CARRIED

4. REQUEST FOR DECISIONS & BYLAWS

a. **Request for Decision regarding Beaver Creek Water Advisory Committee - Terms of Reference.**

Patty Edwards entered the meeting at 3:35 pm.
Douglas Holmes entered the meeting at 3:37 pm.

MOVED: G. Blakey
SECONDED: D. Nass

THAT the Beaver Creek Water Advisory Committee recommends that the Alberni-Clayoquot Regional District Board of Directors approve the amended Terms of Reference as presented with the addition of Section 4.1 to read "To a maximum of Seven (7) members at-large…" for the Beaver Creek Water Advisory Committee.

CARRIED

b. **Request for Decision regarding Beaver Creek Water – 2019-2023 Financial Plan**

MOVED: H. Carlson
SECONDED: G. Blakey

THAT the Beaver Creek Water Advisory Committee recommends that the Beaver Creek Water System proposed budget to be included in the first reading of the 2019-2023 Alberni-Clayoquot Regional District Financial Plan.

CARRIED

c. **Request for Decision regarding Beaver Creek Water System Asset Management Plan**

MOVED: P. Edwards
SECONDED: D. Nass

THAT the Beaver Creek Water Advisory Committee recommends that the Alberni-Clayoquot Regional District Board of Directors adopt the Beaver Creek Water System Asset Management Plan Version 1.0.

CARRIED

Douglas Holmes, Tricia Bryant and Julia Martin left the meeting at 4:30 pm.

d. **Request for Decision regarding a Request for Leak Forgiveness**

MOVED: P. Edwards
SECONDED: G. Blakey

THAT the Beaver Creek Water Advisory Committee approve the request for a $401 adjustment in additional water leak forgiveness and for the balance to incur no penalties in 2019 on the basis of financial hardship.

CARRIED

6. LATE BUSINESS

a. Water Sampling at the end of Willow Road

H. Carlson questioned why it was necessary to conduct weekly testing. J. Brunn explained that it is a requirement of Island Health to sample multiple locations within the system weekly and then proceeded to detail the process.

7. NEXT MEETING

8. ADJOURN

MOVED: H. Carlson
SECONDED: P. Edwards

THAT this meeting be adjourned at 4:44 pm.

CARRIED

Certified Correct:

John McNabb,
Chairperson

Teri Fong,
Manager of Finance

ALBERNI-CLAYOQUOT
3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REQUEST FOR DECISION

To: Beaver Creek Water Advisory Committee

From: Jenny Brunn, Manager of Operations

Meeting Date: July 16, 2019

Subject: Update Leak Policy to include Maximum Overage Charges

---

Recommendation:

THAT the Beaver Creek Water Advisory Committee recommend to the ACRD Board of Directos that the leak policy be updated to include a maximum overage charge of $1,500.

Desired Outcome:

To update the leak policy.

Summary:

A customer in the Bamfield Water System experienced a leak in November of 2018 resulting in excessive overage charges. The Bamfield Water Committee recommended a reduction of these charges and an update to the leak policy to limit overage charges to $1,500. The staff report is attached for information. As the leak policy applies to all areas of the Regional District, staff are seeking support from the Beaver Creek Water Advisory Committee to update the policy prior to bringing to the Board of Directors for consideration.

The majority of leak events in the Beaver Creek Water System are relatively small, fixed quickly and adjusted if the property owner completes a leak forgiveness request form. The existing leak policy allows for a rebate of up to 50% of the overage charge (one time per three year period). From our records, we see that the highest leak event in the Beaver Creek Water System resulted in $1,540 in overage charges and was reduced by 50% as per the policy.

Financial:

Any leak adjustments that are provided during the year reduce the revenue of the Beaver Creek Water System.

Time Requirements – Staff & Elected Officials:

Some staff time will be required to communicate with the owner based on the direction of the committee.

Submitted by: _____
Jenny Brunn, Manager of Operations

Reviewed by: _____
Rob Williams, General Manager of Environmental Services

Approved by: _____
Douglas Holmes, BBA, CPA, CA, Chief Administrative Officer

ALBERNI-CLAYOQUOT
3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REQUEST FOR DECISION

To: Bamfield Water Advisory Committee

From: Jenny Brunn, Manager of Operations

Meeting Date: March 11, 2019

Subject: Request for Leak Forgiveness

Recommendation:

THAT the Bamfield Water Advisory Committee recommend to the Board to approve a reduction of $6,115.20 in overage charges for the Huu-ay-aht First Nation (HFN) Market, reducing the amount owed to $1,500.00 and that the the leak policy be updated to include a maximum overage charge of $1,500.

Desired Outcome:

To provide a response to the Huu-ay-aht First Nation (HFN) Market regarding their request for a leak adjustment in excess of the 50% authorized by the policy and to review the leak policy for possible amendments.

Summary:

On October 4th, during the investigation of a water leak at the HFN Market, there was determined to be a significant leak on their service line. The market proceeded to find and repair the leak. Unfortunately, the volume of water lost prior to this repair was significant resulting in a $7,615.20 charge in excess water use on the July to September 2018 bill.

Based on historical water usage, this property's average consumption charges for this billing period is $610.00. This leak resulted in approximately $7,000.00 in charges over their normal usage. The water consumption charges for this property range from $1,075 to $1,450 for the entire year.

The HFN Market has requested that special consideration be given to this situation due to the excessively high bill. The Leak Policy, dated November 26, 2014, applies to the Bamfield Water System and has been attached for your information. The policy allows for staff to approve a reduction of 50%. It does not provide a maximum amount that a property can be charged in any given billing period as a result of leakage.

The intent of water consumption charges are to 1) recover the costs to operate the system and; 2) encourage water conservation and leak detection. The costs to the utility for treating and delivering the amount of water that was lost to leakage at the HFN Market are less than the overage charges on the current bill. Excessive charges above system costs can end up being punitive instead of encouraging proper behavior and result in an undue burden to a property owner. The decision to approve additional water leak forgiveness is at the Board of Director's discretion as the policy does not provide direction in this situation.

The majority of leak events in the Bamfield water system are relatively small, fixed quickly and adjusted if the property owner completes a leak forgiveness request form. The existing leak policy allows for a rebate of up to 50% of the overage charge. From our records, we see that highest resulting leakage charge was in September 2016 and resulted in $2,974 in overage charges. This is a significant outlier in comparison to the average overages from leakage events. However, in this case, the existing leakage policy was applied and the property owner paid a total of $1,487 in overage charges for the leakage. This is the largest amount that has been paid for overage charges due to leakage.

In order to address this situation, future leak situations and remain fair to all properties in the system, it is recommended that a cap be added to the leak policy. This cap will be set at the maximum amount that has been paid in the past, which is just under $1,500.00. Therefore, staff recommend that the overages charges are reduced to $1,500 and the leakage policy be updated to cap the maximum overage charges that may be charged at $1,500 and that the application from the Huu-ay-aht First Nation Market be considered and approved within the updated policy.

While the amount of $1,500 is somewhat arbitrary, it is recommended because it will not overly burden the water utility, it will not create a disparate situation when compared to past forgiveness applications and it will still provide incentive for property owners to avoid and mitigate leaks.

Financial:

Any leak adjustments that are provided during the year reduce the revenue of the Bamfield Water System.

Options Considered:

There are four other options that the Bamfield Water Advisory Committee could consider:

1. Deny the request to consider an additional adjustment.
2. Approve a reduction of $7,005.20 and bill based on the average consumption in this billing period for this property of $610.00
3. Direct staff to provide a 50% reduction of $3,807.60.
4. Approve a portion of the request based on either a percentage or amount of the $7,615.20

Time Requirements – Staff & Elected Officials:

Some staff time will be required to communicate with the owner based on the direction of the committee.

Submitted by: 

Jenny Brunn, Manager of Operations

Reviewed by: 

Rob Williams, General Manager of Environmental Services

Approved by: 

Douglas Holmes, BBA, CPA, CA, Chief Administrative Officer

Alberni-Clayoquot Regional District
LEAK POLICY

Policy Issued by: Board of Directors
Date Adopted: November 26, 2014

Purpose:

The objective of this policy is to establish a procedure that would authorize the accounting staff of the Alberni-Clayoquot Regional District to respond to requests from property owners for adjustment to their utility bill, as a result of a water leak.

Policy:

Staff will endeavor to identify excessive water consumption for customer accounts when preparing their utility invoices. Staff will make an effort to contact the property owners that have what is considered to be an extremely high consumption and indicate that there may be a leak. This will also be followed up by correspondence which will be mailed with the relevant utility invoice.

The property owner is expected to repair the leak immediately. If the leak cannot be fixed immediately, it is the property owner's responsibility to request Regional District staff to shut off the water at the meter. Or the property owner's may shut off another water valve on the property to prevent the water from escaping until the repairs can be made.

Procedure:

Accounting staff are authorized to adjust utility invoices subject to the following conditions:

1. The property owner advises the Alberni-Clayoquot Regional District, by completing the attached form, that a leak has been identified and repaired.

2. The property owner has supplied the Regional District with detailed receipts showing proof of repairs (i.e. plumber's invoice, receipts for materials, etc.) or a detailed report of the repairs performed.

3. If it is determined that the leak was repaired within a reasonable time period, an adjustment shall be calculated as fifty percent (50%) of the dollar amount of the overage that resulted from the leak.

4. Staff is not authorized to process a second adjustment within three (3) years without the request being approved by the appropriate water advisory committee.

Leak Adjustment Request Form

Property owners can apply for a leak adjustment for excess water volume charges resulting from a leak. To be eligible for a leak adjustment you must have repaired the leak in a reasonable time from the discovery of the leak, and provide proof of the leak repair (receipts for any materials or services related to that repair).

If you wish to apply for a leak adjustment, please complete the form below and return it to our office as soon as possible with the necessary receipts. If your leak adjustment request is approved, a credit of fifty percent (50%) of the dollar amount of the overage will be applied to your account, and you will receive an amended bill.

Application Date:	
Name of Owner(s)	
Telephone #:	
Mailing Address:	
Service Address:	
Description of Leak and Repairs: (if necessary, please use another page)	

Please enclose copies of the receipts for any materials or services related to the repair.

As the owner of the property, I hereby apply for a billing adjustment and confirm that the above and attached information is true and accurate.

Signature of Owner:	Date:

Office Use Only

Approved: Yes ☐ No ☐	By:	Amount:

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT
3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REPORT FOR INFORMATION

To: Beaver Creek Water Advisory Committee

From: Jenny Brunn, Manager of Operations

Meeting Date: July 16th, 2019

Subject: **Beaver Creek Water System 2018 Annual Report**

Recommendation:

THAT the Beaver Creek Water Advisory Committee receive the 2018 Water System Annual Report.

Summary:

This report provides an overview of the Alberni-Clayoquot Regional District's (ACRD) Beaver Creek Water System (BCWS) operations for the year and how it has met the targets to ensure provision of potable, cost-effective and reliable water.

In 2018, the BCWS met most targets with a few exceptions. The first exception was in meeting the *Canadian Drinking Water Quality Guidelines (CDWQG).* There are over 40 parameters in the guidelines, all of which were met except for the exceedance of the maximum acceptable limit for Disinfection Byproducts (DBP) resulting from a very high result during the late December sampling period. The average results for Total Haloacetic Acids (HAA) was 81 ug/L in comparison to the guideline limit of 80 ug/L. DBPs are directly related to dissolved organics and turbidity of the source water. China Creek, the main source of water, has low dissolved organics and turbidity for the majority of the year. However, during heavy rain events, the turbidity increases above the maximum acceptable limit of 1 NTU, requiring the use of an alternate source which is Bainbridge Lake. The lake has higher dissolved organics than China Creek but does not experience spikes in turbidity.

Targets and Results for 2018:

	Target	2018 Results
Bacteria Results	0	0
Chlorine Residual	>0.20 mg/l	>0.20 mg/l
Turbidity	< 1.0 NTU	<1.0 NTU
CDWQG	100%	99%
Average Demand	<350	334 liters per capita day
Peak Demand Ratio	<2	1.65
Cost per customer	$300-$400	$574
Water Loss	<15%	21%
Breaks	<5	10

The other targets that were not met in 2018 were the *Cost per Customer*, the *Number of Breaks,* and the *Water Loss*. These three targets are somewhat related as breaks increase costs due to machine time, parts and labor and result in water loss. In an effort to reduce costs associated with system failures, staff are working to create and implement a preventative maintenance program as well as continue and accelerate the renewal and replacement of aging infrastructure. This is also a comparatively high cost water system to operate due to the size of the water department which is too small to achieve economies of scale for staffing, equipment and building costs. Staff are investigating cost saving measures and staff allocations to address this challenge.

This report will be provided to the local Environmental Health Officer from Island Health and made available to the community.

Policy or Legislation:

The Province of British Columbia's Drinking Water Protection Act and Health Canada's Canadian Drinking Water Guidelines.

Submitted by: _____
Jenny Brunn, Manager of Operations

Reviewed by: _____
Rob Williams, General Manager of Environmental Services

Approved by: _____
Douglas Holmes, BBA, CPA, CA, Chief Administrative Officer

BEAVER CREEK WATER SYSTEM

ANNUAL REPORT
2018

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

Prepared by: John Thomas
Environmental Services Department
3008 Fifth Avenue, Port Alberni, BC, Canada, V9Y 2E3, Phone 250-720-2700

Table of Contents **Page #**

1.0 Background

Purpose of the Annual Report

This annual report provides an overview of the Alberni-Clayoquot Regional District's (ACRD) Beaver Creek Water System. It is the ACRD's responsibility to the community and provincial health authority to share this information. This report is for the water consumers to review their individual water systems in order to be aware of the service provided and of the annual activities.

Regulating Authority

The Province of British Columbia's Drinking Water Protection Act and Regulation prescribes the required performance of drinking water suppliers. The Island Health Authority (IH) is the body that oversees water systems in the ACRD, with the mission to minimize health risks to the public and to assist with providing safe drinking water to our communities. As part of IH regulations, water systems are required to have operators qualified by the Environmental Operators Certification Program to the same classification level as the system.

Management

The ACRD's Environmental Services Department is responsible for the overall management of the Beaver Creek Water System. The Beaver Creek Water System has an advisory committee made up of the Beaver Creek Electoral Director and volunteer members from the community. This committee provides guidance and advice to the ACRD management regarding infrastructure improvements, bylaws and costs.

Beaver Creek Water System Overview

Beaver Creek is a community of 2,873 (2016 Census) which borders the City of Port Alberni on the south, the Beaufort Electoral Area on the north and east, and the Sproat Lake Electoral Area on the west. The Stamp and Somass Rivers form the western boundary of Beaver Creek. The Beaver Creek Improvement District converted into a local service area of the ACRD on June 1st, 2012.

The majority of the Beaver Creek Water System was constructed in the 1960's. The water mains were originally constructed with asbestos cement pipe and more recent improvements with polyvinyl pipe (PVC). Historically, the source water was from the Stamp River but it is now from the City of Port Alberni through a bulk water agreement. The City's water is treated with chlorine and enters Beaver Creek at the Strick Road Booster Pump station where it is rechlorinated and distributed.

The water system is certified by the Environmental Operators Certificate Program (EOCP) as a Level Two Water Distribution System. There are two full time staff members that maintain and operate the system who are both certified as Level 2 Operators.

The Beaver Creek Water System includes:

- Concrete reservoir on Kitsuksis Road, Volume of 1,135 cubic meters

- Bolted steel reservoir on Beaver Creek Road, Volume of 273 cubic meters
- Glass fused reservoir on Kitsuksis Road, Volume of 1,135 cubic meters
- Strick Road Pump Station
- Darnley Road Pump Station
- North Reservoir Pump Station
- Stamp River Pump Station and Intake (currently not active)
- Service connections: 982
- Number of water parcels: 1,037
- Population: 2,873 (BC Stats 2016)
- Total length of mains: 46.3 kilometers
- Total number of fire hydrants: 114
- The majority (67.5%) of the distribution system is Asbestos Cement (AC)
- The remainder is made up of polyvinyl chloride (PVC)
- Average daily flow for 2018: 1044 cubic meters

2.0 Goal and Targets

It is our mission to provide potable, cost effective and reliable drinking water through continuous improvements

---

In order to achieve this mission, measurable targets for potability, cost-effectiveness, and reliability have been set.

Potable Targets:

1) No E.coli, no total coliform in any water samples
2) Minimum 0.20 mg/L chlorine residual throughout the distribution system
3) Less than 1 NTU turbidity in the water
4) Meet the Canadian Drinking Water Quality Guidelines for all parameters (including DBPs)

Regular potability sampling of drinking water is conducted for physical, chemical and biological parameters. This sampling is to ensure that the drinking water meets the Canadian Drinking Water Quality Guidelines and is safe to drink. Each water system is provided with an Operational Certificate by IH that may outline specific testing and frequency requirements.

Target 1 – No E.coli and No Total Coliform in any water samples

Bacteria testing is performed once a week at multiple locations for Total Coliforms and Fecal Coliforms (E.Coli). The locations are spread throughout the distribution system for broad representation. The Total Coliforms and Fecal Coliforms are tested as they are good indicator organisms. Indicator organisms are easy and inexpensive to test for, can be correlated with the potential contamination level and are not

present in unpolluted waters. IH's Water Sample Range Report shows that all 198 samples taken in 2018 tested positive for bacteria.

BEAVER CREEK WATER SYSTEM - Water Sample Range Report

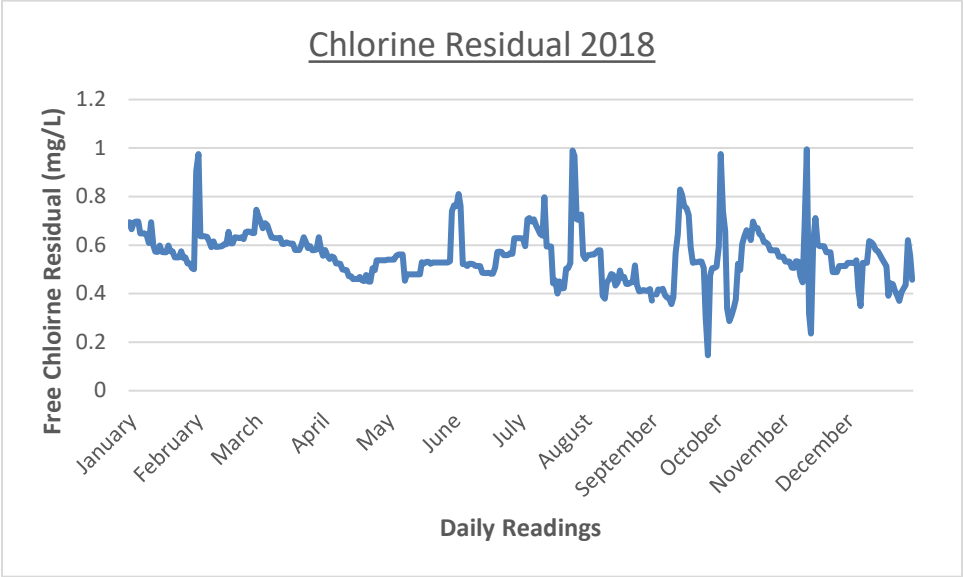
Range Report Information	
Date range	Jan 1 2018 to Dec 31 2018
Total number of samples	198

Water Sample Details	
Samples that contain coliform	0 (0% of total)
Samples that contain fecal coliform	0 (0% of total)
Samples that contain e. coli	0 (0% of total)
Number of consecutive samples that contain total coliform	0 (0% of total)
Number of samples that contain total coliform in last 30 days	0 (0% of total)

For more information regarding bacteriological quality guidelines please refer to the Guidelines for Canadian Drinking Water Quality.

Target 2 - Minimum 0.20 mg/L Chlorine Residual

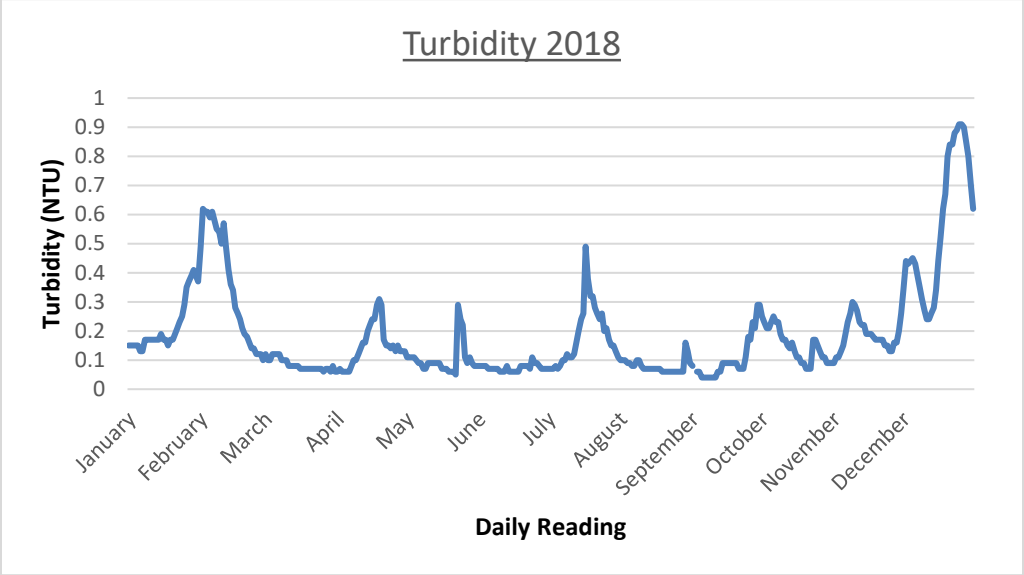
To ensure good water quality throughout the distribution system, water mains are regularly flushed to remove any accumulated silt in the water mains by creating an increase in velocity to scour the pipes. As water flows within a distribution system, the chlorine is slowly eaten up by organics in the water or any material built up in the pipes. Residual chlorine is an immediate test to measure if the water is safe to drink, although water without a chlorine residual is not necessarily unsafe, other tests to ensure safety (such as bacterial testing) require 3 to 4 days for results. Low to no chlorine residual in the water system can indicate poor circulation of water and a need to increase flushing.



The water system operators continually check the free chlorine disinfection levels with the aim to keep the free chlorine levels between 0.4 mg/l and 0.6 mg/l in the reservoirs and 0.2 mg/l at all the ends of the distribution system.

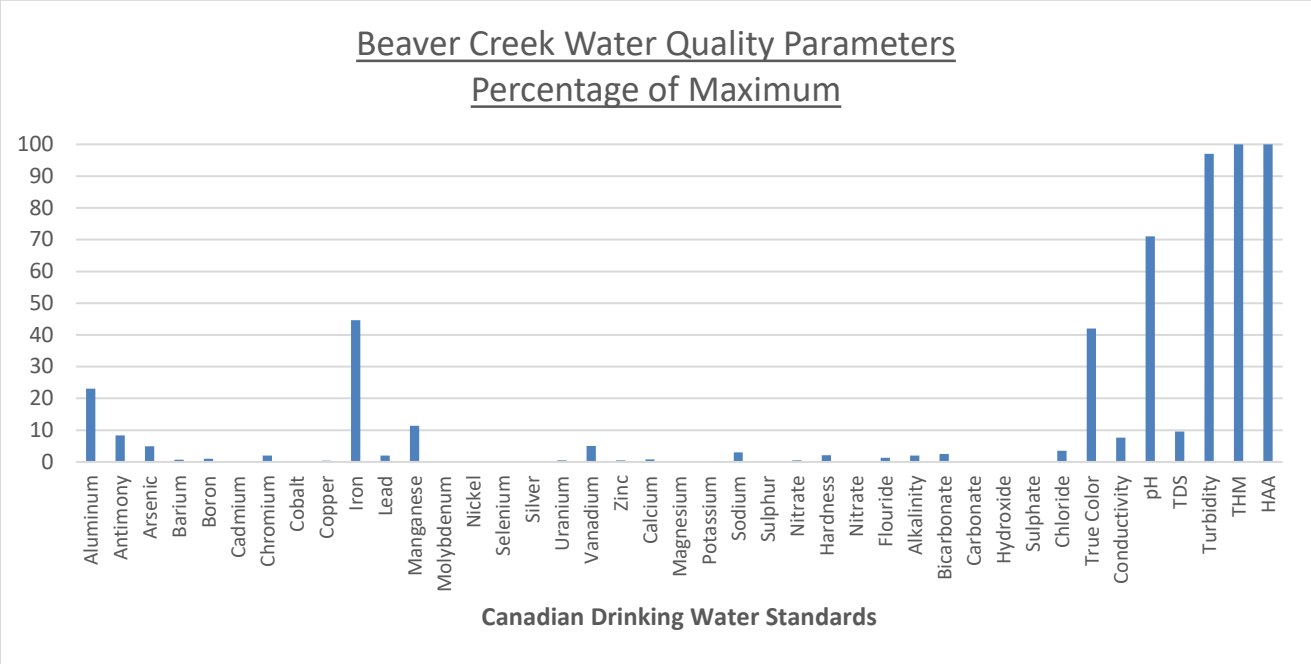
Target 3 - Less than 1 NTU Turbidity in the water

Turbidity is the cloudiness or haziness of a fluid caused by particles in the water. It is often increased in lakes and rivers after a heavy rain when soils enter the water body. This parameter is continually monitored as it negatively effects the ability of chlorine to disinfect.

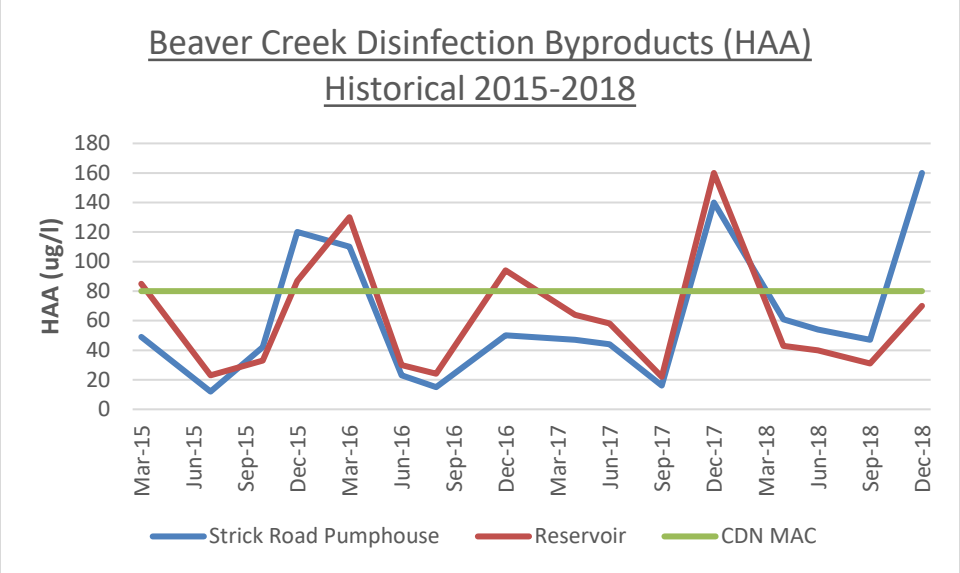


The turbidity readings are taken from the Strick Road Pump Station as water enters the system. The turbidity can have some variability due to events in the City's water system such as water line breaks or source water changes. In the event of high turbidity entering the system, the automation in the pump house can stop pumping to protect the system.

Target 4 - Meet the Drinking Water Quality Guidelines



The ACRD regularly performs tests to ensure that water in the system meets or exceeds the Canadian Guidelines for Drinking Water Quality. Results from the December 2018 testing are shown in the graph above. There are over 40 parameters in the guidelines, all of which were met except for the exceedance of the maximum acceptable limit for Disinfection Byproducts (DBP) during the late December sampling period. DBPs are directly related to dissolved organics and turbidity of the source water. China Creek, the main source of water, has low dissolved organics and turbidity for the majority of the year. However, during heavy rain events, the turbidity increases above the maximum acceptable limit of 1 NTU, requiring the use of an alternate source which is Bainbridge Lake. The lake has higher dissolved organics than China Creek but does not experience spikes in turbidity.



The Total Haloacetic Acids (HAA) maximum acceptable concentrations (MAC) by the Canadian Drinking Water Guidelines are 80 ug/L based on a running average of a minimum quarterly sampling. The values obtained at the reservoirs were all under the MAC running average but the pump house MAC running average was just over, at 81 ug/L due to December's value at 160 ug/L.

Cost-Effective Targets:

1) Average Water Demand less than 350 lpcd
2) Peak Demand Ratio of less than 2:1 PDD:ADD
3) O&M cost per customer less than $400

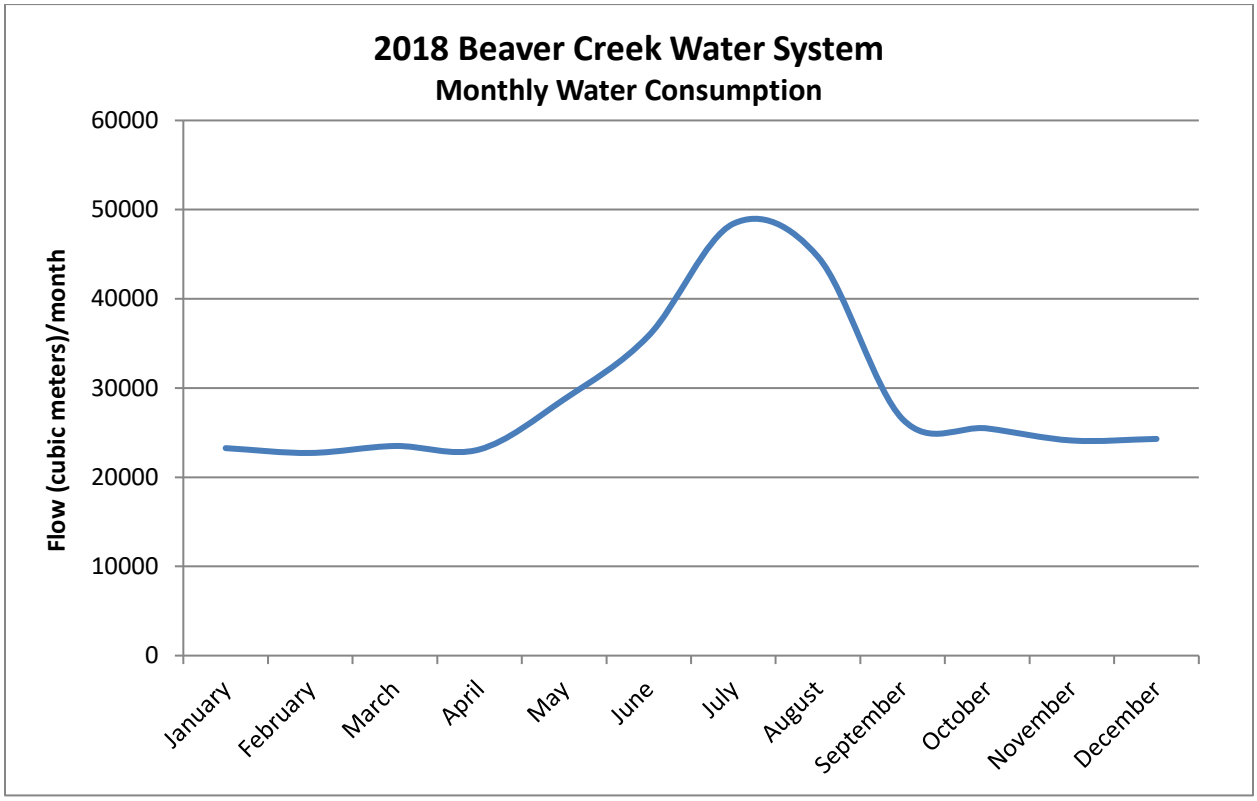
There are many factors that affect how cost effective a system is running. Effective management and planning, bulk water purchase and water demands can all affect system costs.

Cost Effective Target 1 - Average Water Demand less than 350 lpcd

The BCWS purchases bulk water from the City of Port Alberni at approximately $0.41/m3. It must also treat and distribute water to meet the demands of the system. With a service area population of 2,873 and total water consumption of 380,922 cubic meters, this produces a daily average of 363 liters per person per day (lpcd). This is just above the target of 350 lpcd and well below the 2016 UBC Survey's provincial average of 494 lpcd.

Cost Effective Target 2 - Peak Demand Ratio of less than 2:1 PDD:ADD

A water system must be designed to provide the peak water demand and fire flows. If peak demands are excessively high, then the water pipes are required to be oversized which is expensive and causes operational challenges in keeping water fresh in the lower flow time periods. Peak summer demand is approximately 47,700 m3/day compared to the average daily demand of approximately 28,830 m3/day. This is approximately 1.65 to 1 ratio of peak to average demand. This is under the target of 2:1.



Cost Effective Target 3 – O&M cost per customer less than $400

In 2018, the total operating costs for the system were $563,833 excluding bulk water purchase and capital investment. Divided by the 1,037 parcels, this results in a $544 cost per customer. Similar sized water systems typically have an operating cost per customer of between $300 and $400 per customer. This value is high because of water system failures and the small size of the system. Emergency breaks

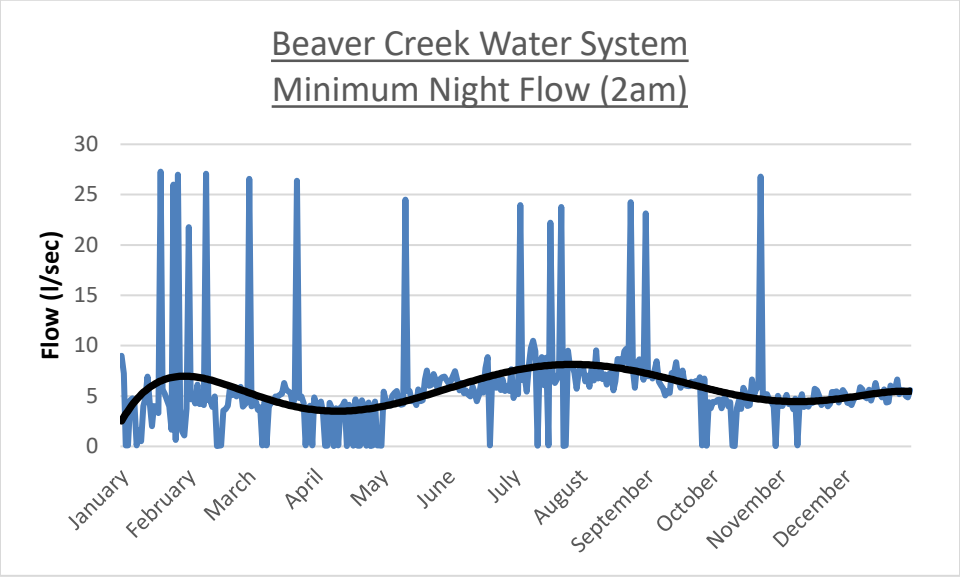
and repairs are costly and directly impact this number which was higher in 2018 than 2017 when we experienced more failures. These costs can be reduced by replacing aging infrastructure. The BCWS also has a comparatively high cost as operations require a minimum of two operators to provide holiday and on-call coverage, meet safety requirements and complete activities that require two people. Whereas other systems of similar size are often operated by a water department that runs multiple systems, allowing efficiencies of scale to occur.

8.0 Reliability Targets:

1) Unaccounted water loss to be less than 15%.
2) Maximum # of breaks less than 5/year.

Reliability Target 1 – Unaccounted water loss to be less than 15%.

In 2018, the City of Port Alberni provided 380,922 cubic meters of water to Beaver Creek through a bulk water agreement. The total water consumed in Beaver Creek through all water meters for 2018 was 270,105 m3. The difference between these two values is the unaccounted or non-revenue water loss. This loss can be attributed to meter error, water main breaks, flushing, unauthorized consumption and leaks. The unaccounted water loss for 2018 was 110,817 cubic meters which made up 29% of the bulk water. This also means that the 110,817 cubic meters of water was purchased from the city and generated no revenue, a potential loss of $45,711. A certain amount of this volume is unavoidable loss including water lost due to main breaks and the flushing program. In order to better determine how much of this volume is unavoidable water loss, the system will begin measuring and recording the volume of water used in flushing.



The minimum night flow can be used to assist in the determination of system leakage. The average night flow is shown to be approximately 5 l/s, as shown in the graph. This value is used in determining

whether a leak is developing in the system. The spikes shown in the graph above illustrates high night flows which the operators can use to determine leak events.

Reliability Target 2 - Maximum # of breaks less than 5/year.

In 2018, the BCWS had two water main breaks and eight service line breaks. Through the water main replacement program, the number of total breaks should eventually be reduced as the mains that are breaking get replaced. Often a service line will break at the water main connection due to the asbestos cement pipe being fragile. Operating the pumps and subsequently increasing pressure during the night results in an increased likelihood of breaks as water consumption is at its lowest. Therefore, all efforts are made to operate the pumps and fill the reservoirs during higher consumption periods.

Summary of Target Results for 2018

This past year, the BCWS met most targets with a few exceptions. The system was successful in meeting the water quality targets with the exception of DBP of HAA that were over the CDWG annual average value. This HAA parameter is dependent on the source water that the City of Port Alberni provides. The other targets that were not met were the cost per customer, the number of water breaks and the water loss. These two targets are related as breaks increase costs due to machine time, parts and labor.

	Target	2018 BCWS
Bacteria Results	0	0
Chlorine Residual	>0.20 mg/l	>0.20 mg/l
Turbidity	< 1.0 NTU	<1.0 NTU
CDWQG	< 100%	99%
Average Demand	<350	363 liters per capita day
Peak Demand Ratio	<2	1.65
Cost per customer	$300-$400	$544
Water Loss	<15%	29%
Breaks	<5	10

3.0 Improvement Plan

2018 Projects Completed

In 2018, approximately 700 meters of four inch aging asbestos cement water main on Drinkwater Road was replaced with six inch PVC and 5 new hydrants. A minor capital project was also completed that tied the water wains of Plymouth and Kerry Roads to eliminate a dead end and reduce the amount of flushing required in the area. A number of water quality test stations were installed to improve the ability to monitor the water. Several new household water connections were installed that reflects the increase in housing construction in the area. As well, all of the faulty meters installed during the 2017 meter exchange program were switched out in 2018. More accurate meter records, are expected in 2019 which will improve leak monitoring efforts.

In 2018, the Board developed an Asset Management Policy, following which the ACRD's Asset Management Coordinator created an asset management plan for the Beaver Creek Water System. The DCC bylaw was adopted in July 2018, which has replaced the capital charge previously charged in the system. As the new system is being implemented, staff are adjusting to the new process and will be reviewing the regulations bylaw for any necessary changes in 2019.

Upcoming Projects

Engineering Design Project – Walker, Fayette and Lamarque Road have been identified as the highest priority water mains for replacement in the system. As the mains are similar in length and location, there will be efficiencies in doing the engineering design work as one project. This may support a large grant application if more programs become available for water infrastructure work.

Walker Road Watermain Capital Upgrade – this project will replace the failing 4 inch AC main with 6 inch PVC main and increase hydrant locations. This project will also reduce emergency repairs for this main and improve overall fire flows. This project will help to reduce the number of breaks and water loss within the system.

WERP Update – The Water System Emergency Response Plan will be reviewed and updated to ensure we have adequate planning in place to address potential emergencies and review the costs and benefits of retaining the original Stamp River infrastructure for emergency supply. This will also review the current on-call program which has a limited staff pool to use.

Preventative Maintenance Review and Plan – Staff are working to create a comprehensive preventive maintenance plan and schedule to reduce corrective and emergency work as well as ensure adequate/appropriate resources are planned for the system. This will have a positive impact on operation and emergency maintenance costs.

Water Systems Review – will be completed to identify options to reduce the Operations Cost per customer. This will include looking at staffing allocation to services and other cost saving measures.

Rates and Bylaw Review – Staff will be updating the bylaw to streamline changes resulting from the DCC bylaw and other operational items. Staff will also be reviewing the current rates to ensure that adequate revenues are being collected to support the renewal and replacement program developed in the Asset Management Plan.

Water Loss Investigation – Staff will be reviewing water use records, meter accuracy, and flushing volumes to get a more accurate estimation of the leakage in the water system. Once this has been determined, leak detection and reduction options will be assessed and a plan to reduce leakage to below 15% will be developed.