# District of Barriere – 2020 Water Conservation Plan

## Introduction & Objectives

The District of Barriere is working to continually improve the water system and public awareness to meet the changing needs of our community.

Water safety is of the utmost importance to the District of Barriere. The supply of good, clean drinking water has been taken for granted by the general public in Canada until events such as the Walkerton E. Coli outbreak brought the safety of the water supply into the public eye. We are dedicated to providing safe, clean water to the residents of Barriere.

### Water Utility Objectives

- To ensure adequate supply of high quality water to the community.
- To effectively treat the raw water to provide potable water of integrity to the community.
- To ensure the adequate delivery of high quality potable water delivery to all points within the system for domestic and emergency purposes.
- To ensure effective management of all water system aspects and provide excellent customer service and information to the community.
- To manage water demand by effectively assessing and managing water losses from leakage in the system.
- To develop an effective water conservation program for operations and the wider community.
- To maintain water rates that encourages conservation and resource awareness while providing quality accessible water to consumers. To encourage water conservation, including the installation of low-flow plumbing fixtures in new construction;[1]
- To raise awareness about BC Climate Action and energy conservation by making relevant information material available to residents;[2]
- To integrate the conservation of natural resources with other community values;[3]
- To develop a water education program.

[1] District of Barriere Official Community Plan Section 3.1.10(f)
[2] District of Barriere Official Community Plan Section 3.1.10(m)
[3] District of Barriere Official Community Plan Section 3.2.2(c)

# Benefits of Conservation & Planning

The District of Barriere currently has an adequate supply of quality water for domestic use and firefighting but it is the planning and consideration we take now that will ensure that our water supply is not compromised in the future.

The economy and the environment benefit from thoughtful planning. Conserving water benefits the economy and the resident tax payers by reducing operational costs of the system.

Planning and raising public awareness on the importance of conserving water also informs our residents about the value and vulnerability of our water source. By reducing or maintaining our current consumption levels we can ensure that the environment is not impacted. However, the need to plan for water supplies from new sources remains necessary, with the District continuing to research the availability of funding sources to meet this need.

Conservation planning requires careful management of water resources and consumption. Implementing regulations such as sprinkling restrictions in the summer months helps to conserve water but additional techniques are required to ensure that water consumption is reduced. Installing low flow toilets in residential homes and commercial properties can also make a difference as does replacing old or broken bathroom fixtures and washing machines that do not qualify as high-efficiency. Xeriscaping yards and public areas is another alternative for beautifying outdoor spaces without compromising the water system.

The District of Barriere requires water meters to be installed on all new construction or property retro-fits. A water meter installation program was completed in 2012 with 100% compliance. The District of Barriere now has the ability to detect water leaks in the system as well as in all buildings ensuring that repairs are completed efficiently and with the least amount of water loss possible.

# Supply Sources & Water System Profile

The District of Barriere's potable water system is supplied by a system of three wells that were constructed during the 1990s. All three wells are located in the northeast quadrant of the community, adjacent to the Barriere River. Two deep wells are located at the north end of Spruce Crescent, and a third shallow well, considered to be under the influence of surface water (GWUDI), is located at the north end of Birch Lane. The wells are summarized in Table 3.1 below. The location of these wells can be seen on the overall water system plan on the following page.

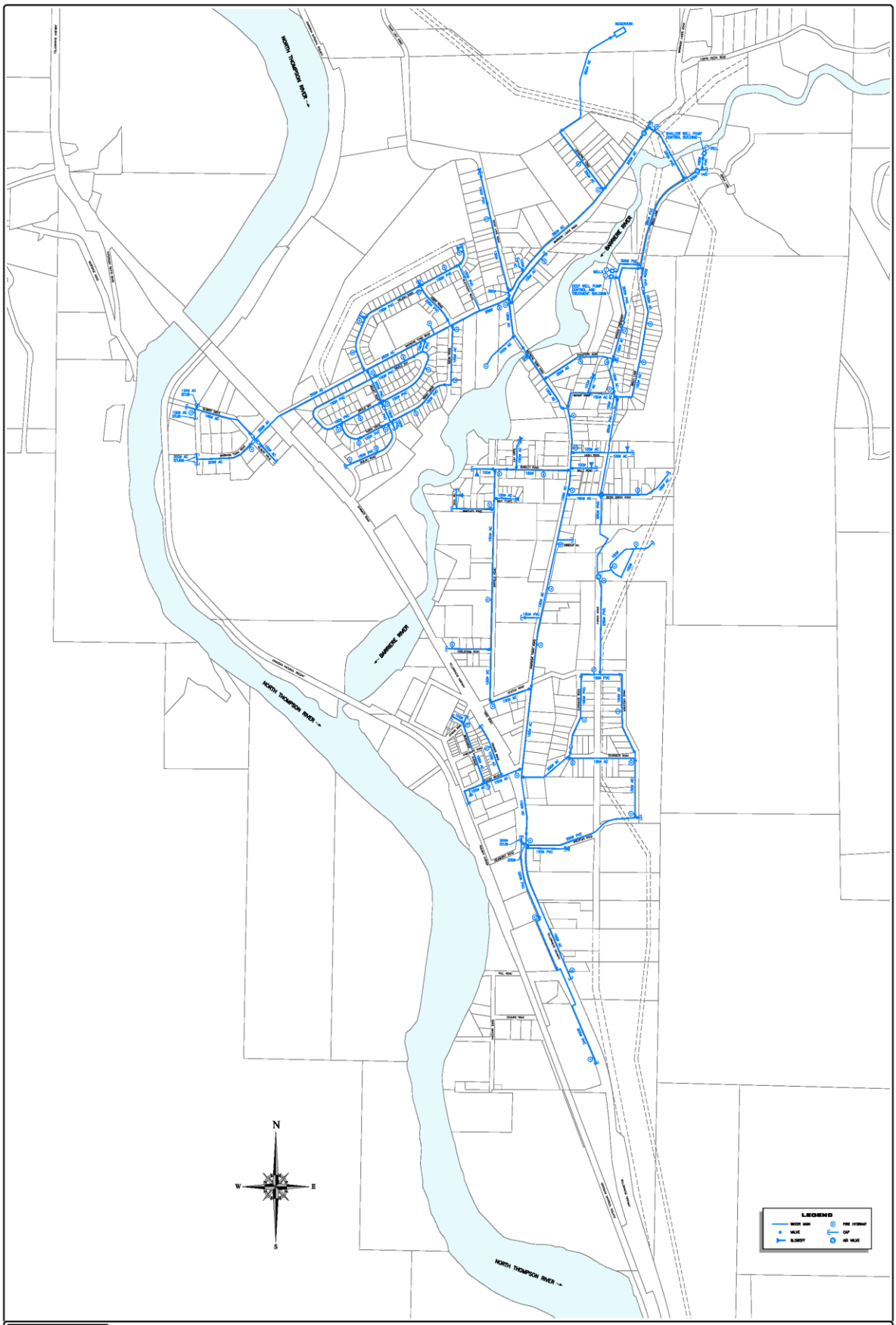
**Table 3.1: Barriere's Supply Wells**

| Well | Year Built | Pumping Capacity (L/s) | Approximate Depth (m) | Known Issues Or Concerns |
|---|---|---|---|---|
| #2 Deep | 1997 | 63 | 35 | Increasing evidence of iron and manganese - limited lifespan |
| PW1 | 2019 | 22 | 91.44 | High Iron, Manganese - Conditioning underway |

## Water Treatment

The well water is injected with a chlorine solution at the pump station such that it contains an approximate free residual chlorine concentration of 0.5mg/L adjacent to the pump stations, and has been measured to 0.3 mg/L at the more remote parts of the system.

In terms of the Interior Health Authority requirements, this treatment is satisfactory in a ground water source that is not under the influence of surface water, as these types of supply are given credit for filtration. Referencing the 4-3-2-1-0 requirements, the chlorine addresses the 4 and the 0, while the fact that the supply is a non-GWUDI well appears to be protected by a confining aquifer and addresses points 3, 2, and 1.




DISTRICT OF BARRIERE

# WATER SUPPLY SYSTEM

FOCUS

## Reservoir Storage

The North reservoir is a rectangular concrete tank with sloping sides and a capacity of 1,540 $m^3$ (406,560 USG). It is located at the north end of the community adjacent to Barriere Lakes Road and has a free water level of 451 metres. A 350mm diameter supply main connects the reservoir with the rest of the system at the intersection of Lodgepole Road and Barriere Lakes Road.

The South reservoir is a rectangular concrete tank and has a capacity of 1,300$m^3$ / 343,200 USG. It is located at the south end of the community near the top of Mountain Road and has a free water level of 451 metres. A 250mm diameter supply main connects the reservoir with the rest of the system at Mountain Road.

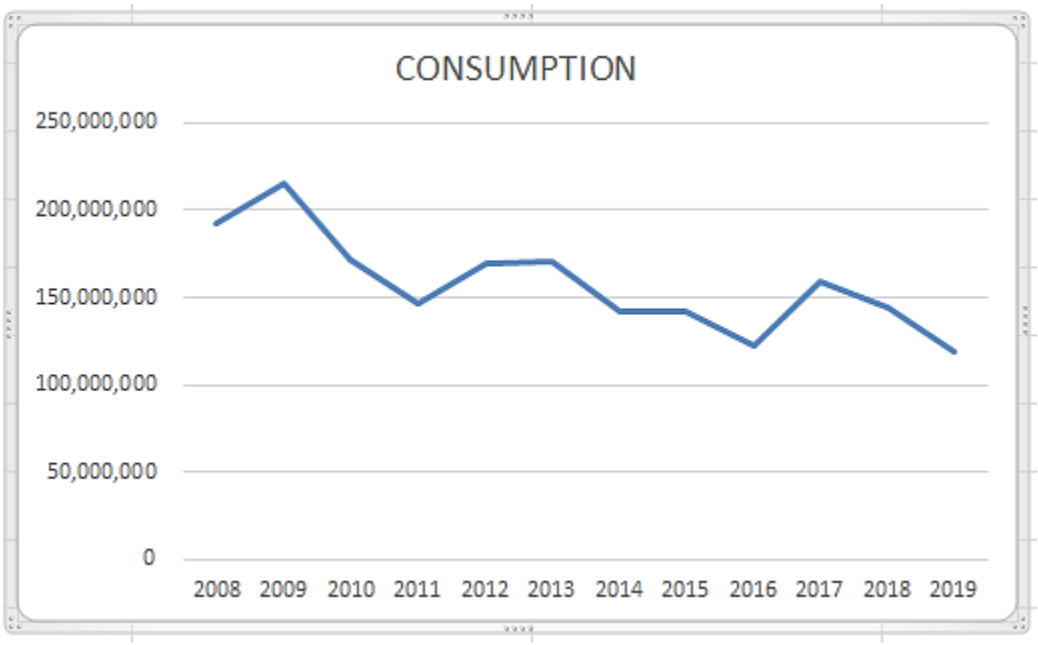
## Distribution System

Approximately 24,750 metres of watermain are joined together to create the District of Barriere water system. The water system has been undergoing upgrades to ensure the water quality is safe for consumption. The first upgrades were from 1966 onwards when the pipes were changed to asbestos cement. Beginning in the 1980's the pipes began to be upgraded to PVC pipes due to the potential health risks of asbestos. The PVC pipes range in diameter from 100 mm to 350 mm and provide potable water to approximately 780 residential and 75 commercial service connections in Barriere.

Several sections of pipe within the District's water supply system are undersized, limiting flows and negatively impacting fire protection and pressures in certain parts of the network.

# WATER CONSUMPTION

| Month | 2018 US Gallons | 2019 US Gallons | 2018 Litres | 2019 Litres |
|---|---|---|---|---|
| January | 7,132,300 | 7,358,400 | | |
| February | 5,822,600 | 6,008,155 | | |
| March | 3,922,100 | 7,132,362 | | |
| April | 7,672,500 | 9,876,852 | | |
| May | 15,431,300 | 9,152,742 | | |
| June | 19,346,900 | 18,399,654 | | |
| July | 25,568,800 | 18,752,814 | | |
| August | 22,099,500 | 11,149,300 | | |
| September | 11,090,200 | 9,736,024 | | |
| October | 9,413,900 | 7,593,404 | | |
| November | 7,024,900 | 6,130,388 | | |
| December | 9,361,000 | 8,256,120 | | |
| **TOTAL** | **143,885,400** | **119,537,215** | **544,655,881** | **452,497,582** |



# Current Conversion Efforts

## Water Meters & Volumetric Billing

One of the most effective tools to increase public awareness of water conservation and inefficient water consumption - particularly in communities where the general perception is of abundant, fresh, clean water is the installation of water meters. When used in conjunction with volumetric pricing and education programs to increase social acceptability, water meters produce the most dramatic reductions in water consumption over all other water conservation measures.[4] Water meters create financial incentive for customers to use water more efficiently and effectively. Customers can gauge their own water use directly reducing their consumption. The installation of water meters also provides early detection of leaks within the system.

## Education

The District of Barriere Official Community Plan states that the Municipality will implement public educational programs encouraging responsible water use and conservation technologies.[5]

In addition to public notices in the local newspaper, website and local radio updates, staff intermittently travel throughout the community and monitor and remind our customers of any current water restrictions.

The District of Barriere strives to develop an education program for adults and children. The educational materials will be available to our customers in print format or can be accessed on the District website. The brochures will promote options and tips for decreasing residential indoor and outdoor water consumption.

## Rain Barrels

Rain barrels have proven to dramatically reduce runoff while capturing the rain water for future use. Rain water collected in the barrel is ideal for use on plants and gardens as it is relatively clean (and unchlorinated). The water that is captured can be used during the hot, summer months when water restrictions are heightened thus reducing unnecessary consumption and pressure on the water system. The District of Barriere has been exploring options on a potential rain barrel program which would offer customers a reduced price to utilize rain barrels on their properties.

## Sustainable Landscaping

Xeriscaping yards and public areas has become increasingly popular as it does not sacrifice a beautiful garden to conserve water. The District of Barriere investigates options for developing these areas within the community. Information on this type of landscaping including planning and maintenance tips, choosing soil and mulch mixtures and selecting appropriate plants for our climate is made available to the public for consideration in their own private yards.

[4] J.L. Jordan and R. Albani. August 1999. Journal Amer. Water works assoc. 91 (8):66-73

[5] District of Barriere Official Community Plan Section 3.2.2(i)

# Improvements & Additions

## System Upgrades Completed from 2009 to 2020

- Installed atmospheric valve at North Reservoir
- Rehabilitation of Deep Well #2
- Drilling of two observation wells for future production wells
- Installation of water meters in 2012
- Upgraded Barriere Town Road from High School to Bradford Rd. from 6” to 10”
- Upgraded Bradford Rd to Spruce Cres. from 10” to 14”
- Drilled 2 new production wells in Bradford Park & initiated rehabilitation of those wells after lightning strike damage to monitoring system.
- Extended 150m line at Seniors Building to Airfield Rd: completed in 2010 (Building Canada Fund Grant)
- Upgraded Section for Barriere Lakes Rd. from 8” to 14”: completed in 2010 (Building Canada Fund Grant)
- Upgraded section of Spruce Crescent from 6” to 10”: completed in 2010 (Building Canada Fund Grant)
- Additional looping completed from Station Road to Borthwick Ave.
- Installation of water line for water reclamation from the Sustainable Water Reclamation Center for Fadear Park Irrigation.
- Installation of new control panel to facilitate new SCADA system
- Developed a new reservoir at the South end of the community.
- Initiated communication system upgrade – allowing the system to be monitored remotely

## Potential System Upgrades

- Complete SCADA Monitoring System upgrade
- Replace reservoir cover
- Upgrade Barriere Town Rd. Bradford Rd. to Mountain Rd. 6” to 10”
- Back up generator for deep wells

## Conclusion

The District of Barriere will continue to manage the current water system as effectively and efficiently as possible while continuing to provide clean, quality water to our citizens.

We are committed to continue reducing the total water consumption from the 2018 level of 143,885,400 US gallons and will work closely with our citizens to educate and promote methods of water reduction.

We would like to thank you in advance for taking the time to review the District of Barriere's Water Conservation Plan. Comments and feedback regarding this report or any other items that pertain to the District of Barriere are welcomed and encouraged and may be directed to our Utilities Manager by calling 250.672.9751 or by email at inquiry@barriere.ca.