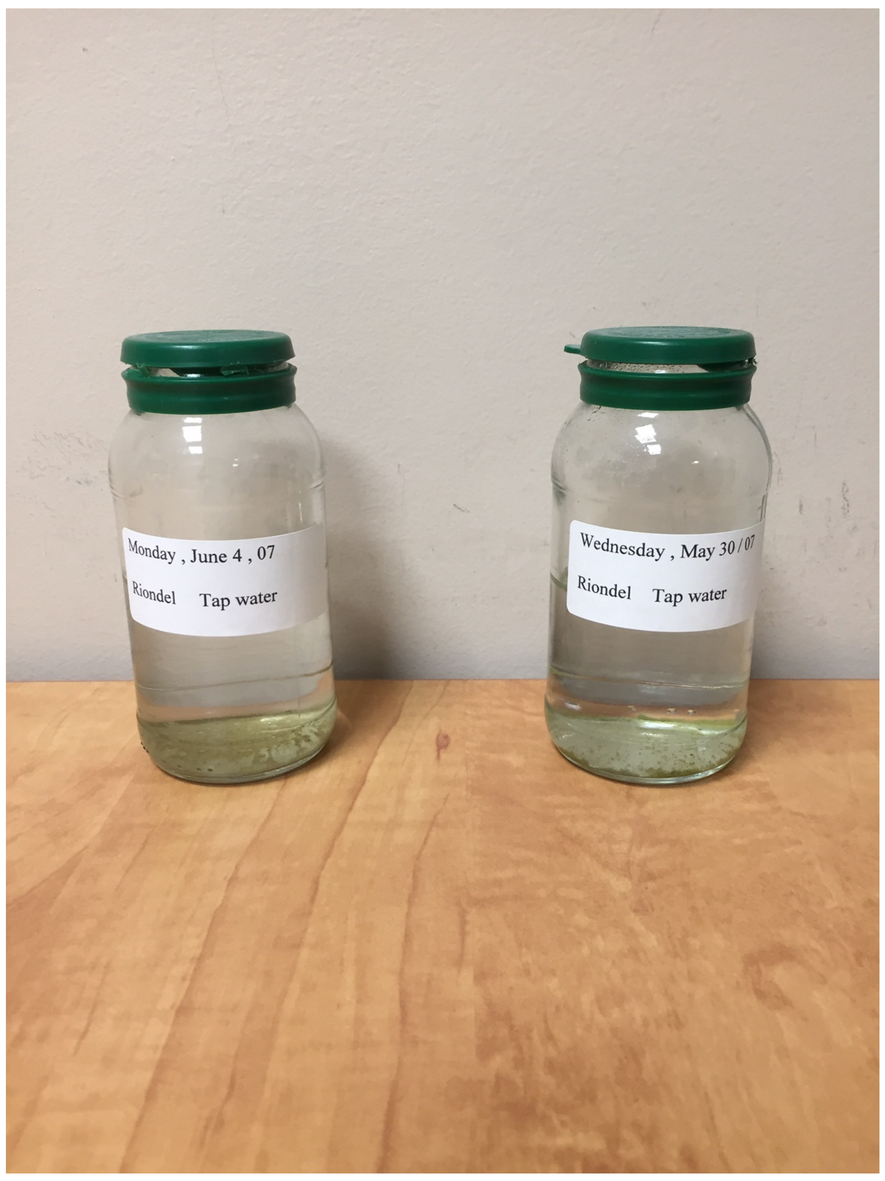
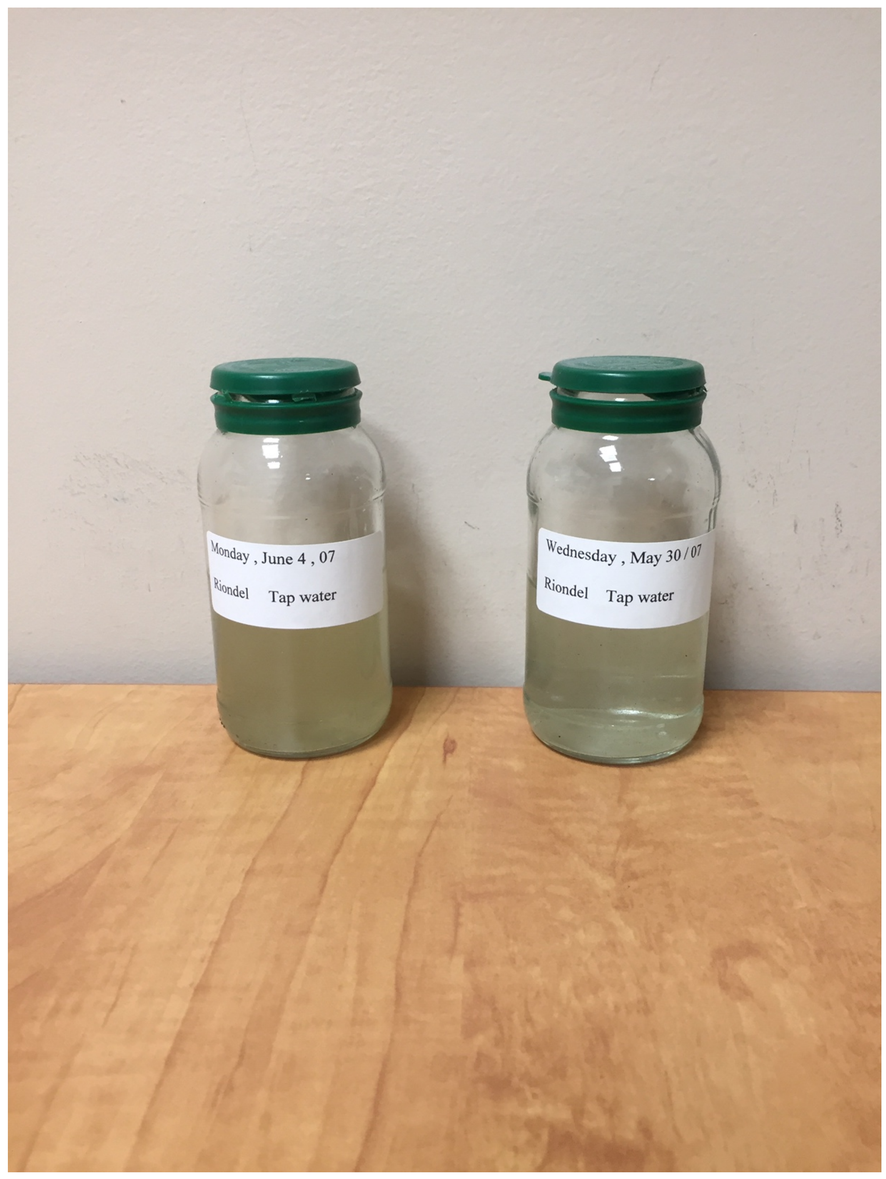
Riondel Water Open House

Pre-Treatment Install Water Quality



May and June 2007
Tap water after days of settling.



May and June 2007
Tap water after a quick shake. 25 NTU

Nematomorpha also known as Horsehair Worm.
Indication of poor treatment.

The community of Riondel has seen Horsehair worm within the distribution system pre 2013.

Riondel Water Open House

Interior Health 43210

Interior Health

Health Protection **Drinking Water Program**

4-3-2-1-0 Drinking Water Objective

Water suppliers are required to provide potable water to all users on their systems. The 4-3-2-1-0 drinking water objective provides a performance target for water suppliers to ensure the provision of microbiological safe drinking water. Interior Health supports water suppliers to meet this objective. All water suppliers serving populations greater than 500 people should have an implementation plan to meet this as a standard.
This objective will be applied as a performance standard for all new water systems. Many existing water systems already meet most of the standard. Risk to human health is substantially reduced when water suppliers meet this objective.

Water suppliers will be required to provide long term plans to reach the goals of:

- 4 log inactivation of viruses
- 3 log removal or inactivation of Giardia Lamblia and Cryptosporidium
- 2 refers to two treatment processes for all surface drinking water systems
- 1 for less than 1 NTU of turbidity with a target of 0.1 NTU
- 0 total and fecal coliforms and E. Coli

Definitions:

4 log inactivation of viruses:

Viruses are easily inactivated by the use of chlorine. The common practice of maintaining 0.5 mg/L of free chlorine for 20 minutes is adequate in most cases.

3 log removal or inactivation of giardia lamblia and cryptosporidium protozoa

The 3 log removal or inactivation of these protozoa is the minimum level required of water systems that have a source that is considered "low risk" by Interior Health and have not had an outbreak of either disease. **Giardia** may be inactivated by large doses of free chlorine, ultraviolet light, ozone and chlorine dioxide, or removed by filtration. The US EPA has developed design guidelines to determine that the proposed treatment will provide the inactivation desired. For example, chemically assisted rapid sand filtration with sedimentation is given a credit of 3.0 log inactivation. Log inactivation credits of 3.0 for slow sand filtration and 2.5 for direct filtration are given The remaining credit must be accomplished by another means such as ultraviolet disinfection or free chlorine with a long contact time. The Guidelines for Canadian Drinking Water Quality for **Cryptosporidium** have developed design guidelines to determine that the proposed treatment will provide the inactivation desired. Systems with optimized conventional rapid sand filtration are given a credit of 3.0 logs. Membrane filtration may be required to demonstrate removal efficiency through challenge testing and verified by direct integrity testing. Ultraviolet disinfection is given a credit of 3.0 logs if the dose is a minimum of 40mj/sq. cm.

2 treatment barriers are a minimum for all surface water sources. A multiple barrier approach to water treatment is associated with providing potable water:

The main risk to water quality is from microbiological agents. Some of these microbial risks are more resistant to some forms of treatment than others. It is recognized that effective treatment for all microbial risks by a single treatment barrier is not effective. A minimum dual barrier of treatment is required for all surface water to reduce the risk of microbial or health threats to drinking water. Water filtration and disinfection will become the norm for surface water supplies in order to meet the 4-3-2-1-0 performance objectives. For other sources where the turbidity standard can be met without filtration (for example, a well beside a lake), dual treatment may mean chlorination and UV light disinfection. Ground water sources that are not under the influence of surface water will be given credit for filtration.

<1 NTU of turbidity (less than)

The Guidelines for Canadian Drinking Water Quality currently specify that the filtered treated water turbidity should have a target of less than 0.1 NTU at all times. Specific filtration technologies may have target turbidity ranges from 0.1 to 1.0 NTU. Exemptions for filtration may be considered for those systems that use two disinfectants plus maintain chlorine residual in the distribution system and can demonstrate compliance with the GCDWQ for exemption for filtration..

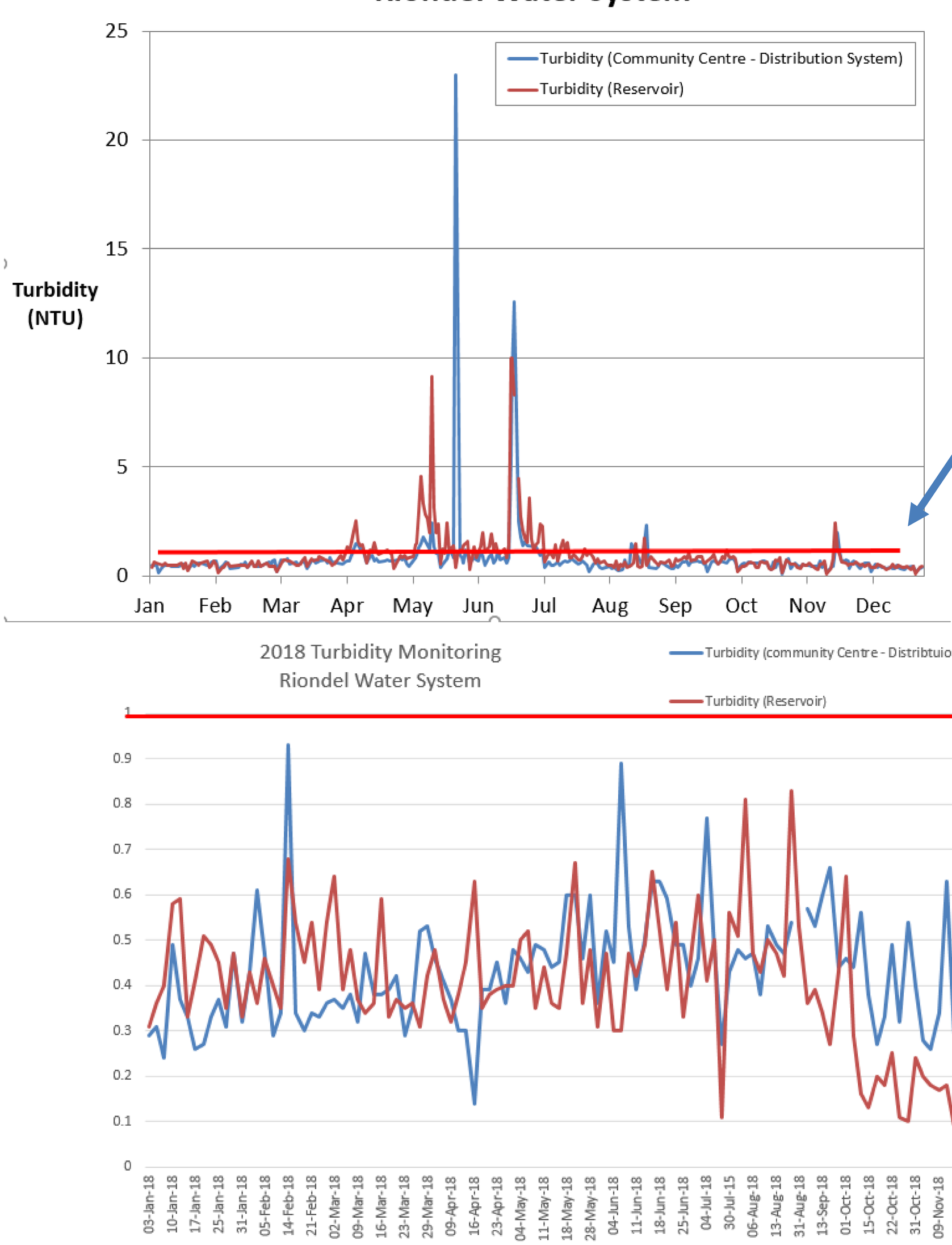
0 Fecal coliform or E. coli bacteria

The Drinking Water Protection Act requires water suppliers to provide water with 0 E.Coli sample results. Coliform bacteria are easily controlled with chlorine, UV light and can be reduced by filtration.

HPF9040 January 2006

Riondel Water Open House

Turbidity Before and After Treatment



System Components

- Approximately 200 Service connections.
- 20 Fire Hydrants/Flush points.
- Distribution System is approximately 90% 150mm PVC, 5% 250mm PVC, and 5% 100mm PVC.
- The Reservoir is bolted steel with a volume of 550,000 Liters.
- Source is a small concrete dam and intake on Indian Creek which gravity feeds to the Water Treatment Plant (WTP).
- The WTP has Ultrafiltration modules that filter the creek water, the UF membranes capable of filtering particles ranging in size from 0.03 microns and larger and disinfect with sodium Hypochlorite (12% chlorine).

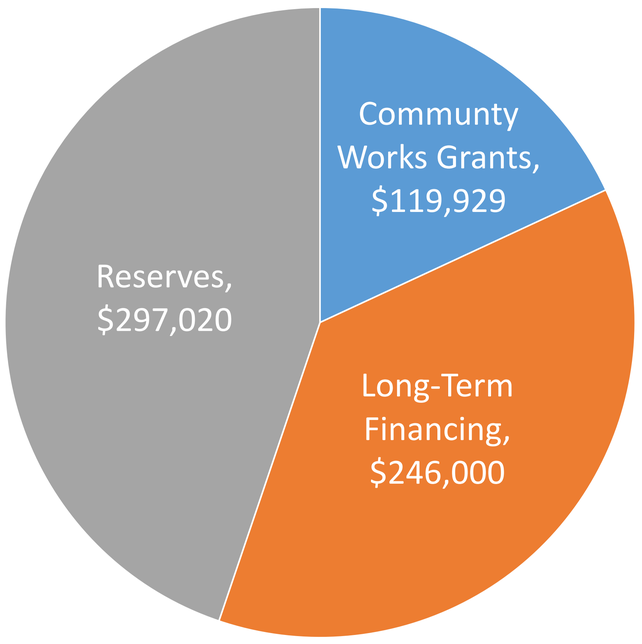
Indian Creek Intake

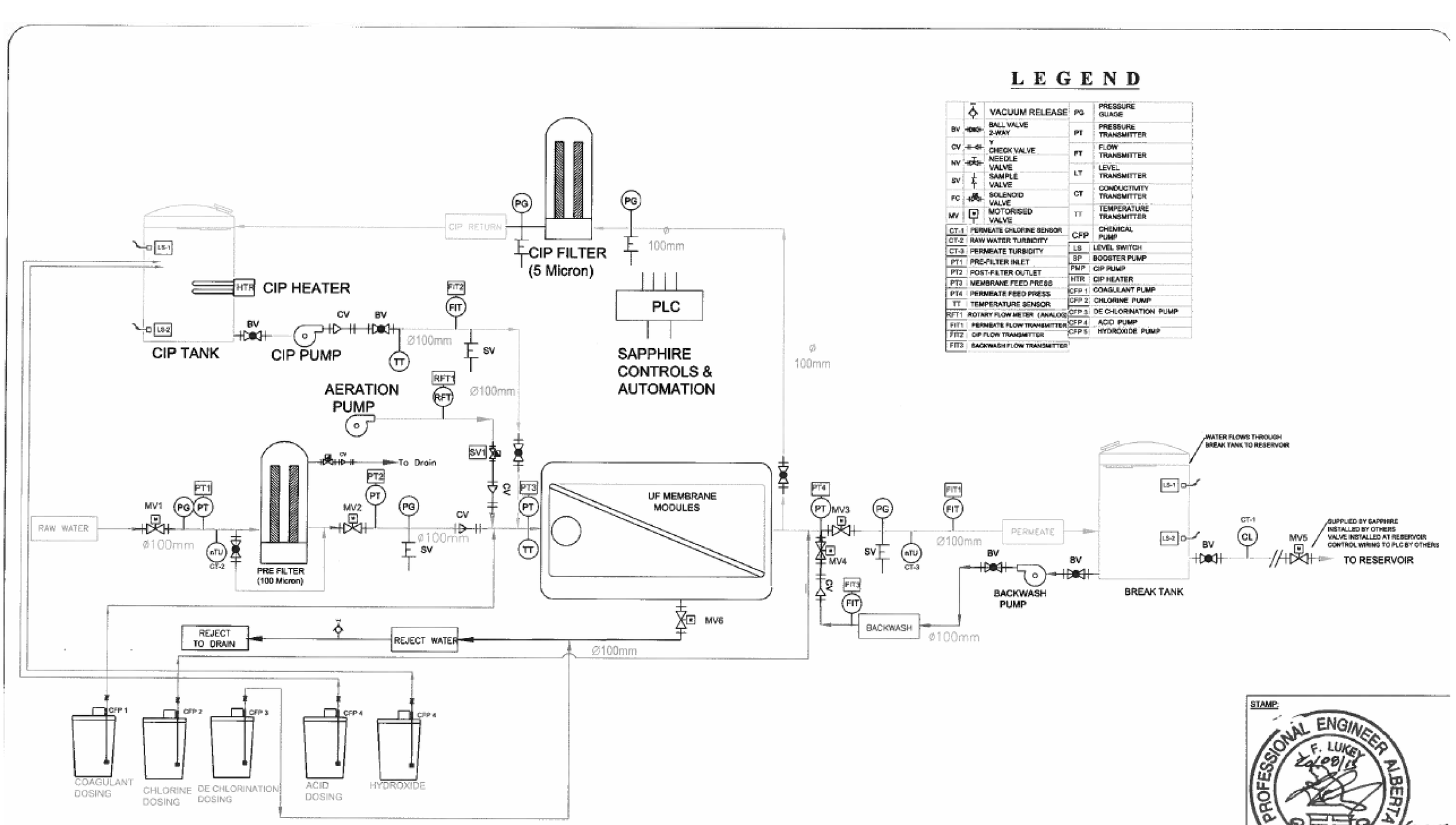
Before and after annual intake cleaning.
Two to three Utility Technicians required for a full days work.
Must be done within fish window.

Riondel Water Open House

System Components WTP

Riondel Water Treatment Plant Funding
Total $662,949





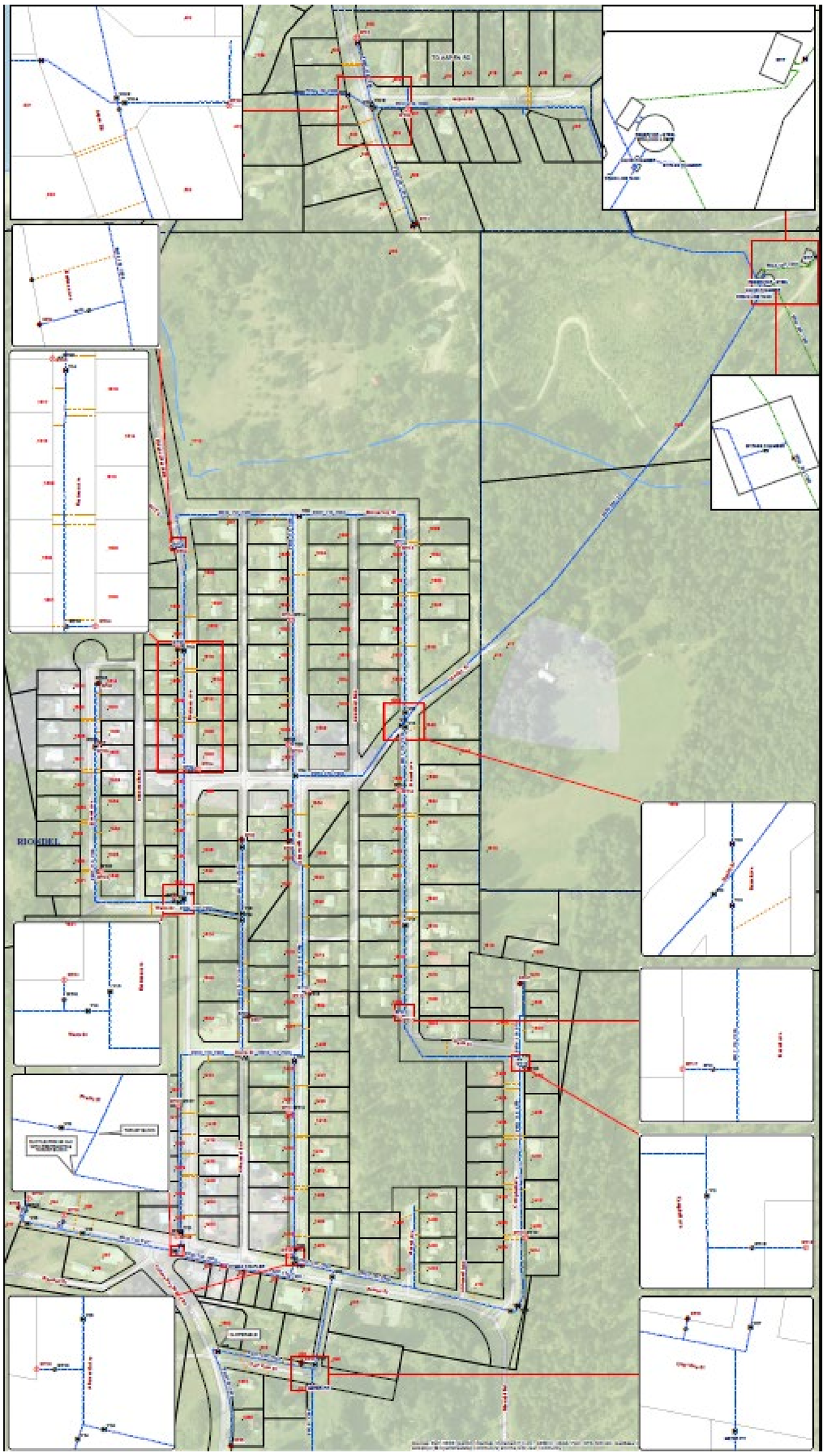
September 16, 2019

Riondel Water Open House

System Components Reservoir

Riondel Water Open House

System Components Distribution



Distribution Repair Card

Date: Feb19/16 Operator: Dave/Jay

Water System: Rondel

Street and Closest Cross Street or Residential Address:
232 Fowler st

Main size and type (if known): SDR26

Type of repair made: Broken pvc T

Repair parts used: 4"x2" service saddle, 4.8-5.1 smith Blair coupler,

2 Measurements of repair in Feet and Inches: 2"MIPxcompression, 2 2" inserts.

(Note: be descriptive. Example: power pole in front of 2034 Lower Six Mile RD)

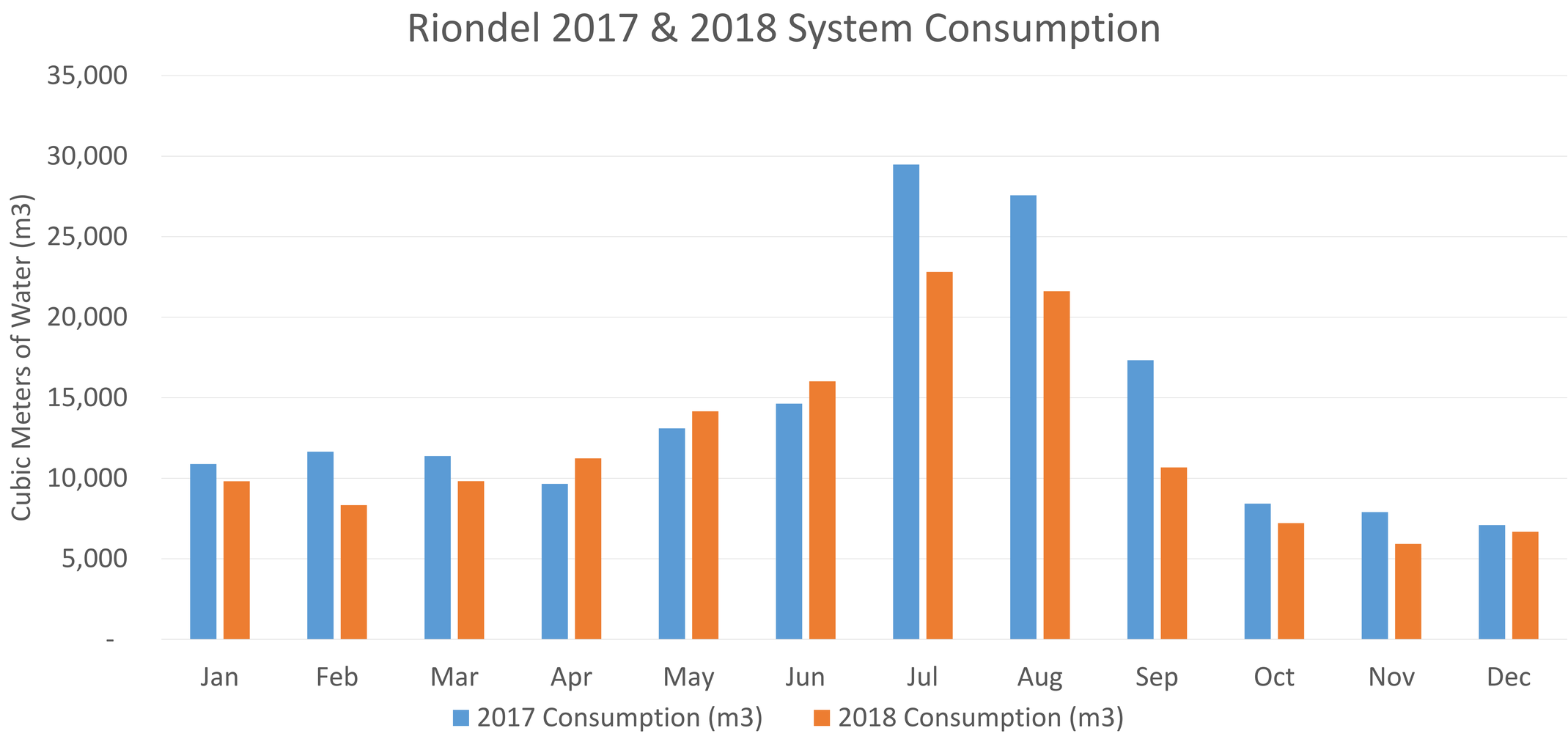
1. Asphalt Edge

Scan into the system specific Maps and Drawings folder then submit a copy to Mapping for updating.

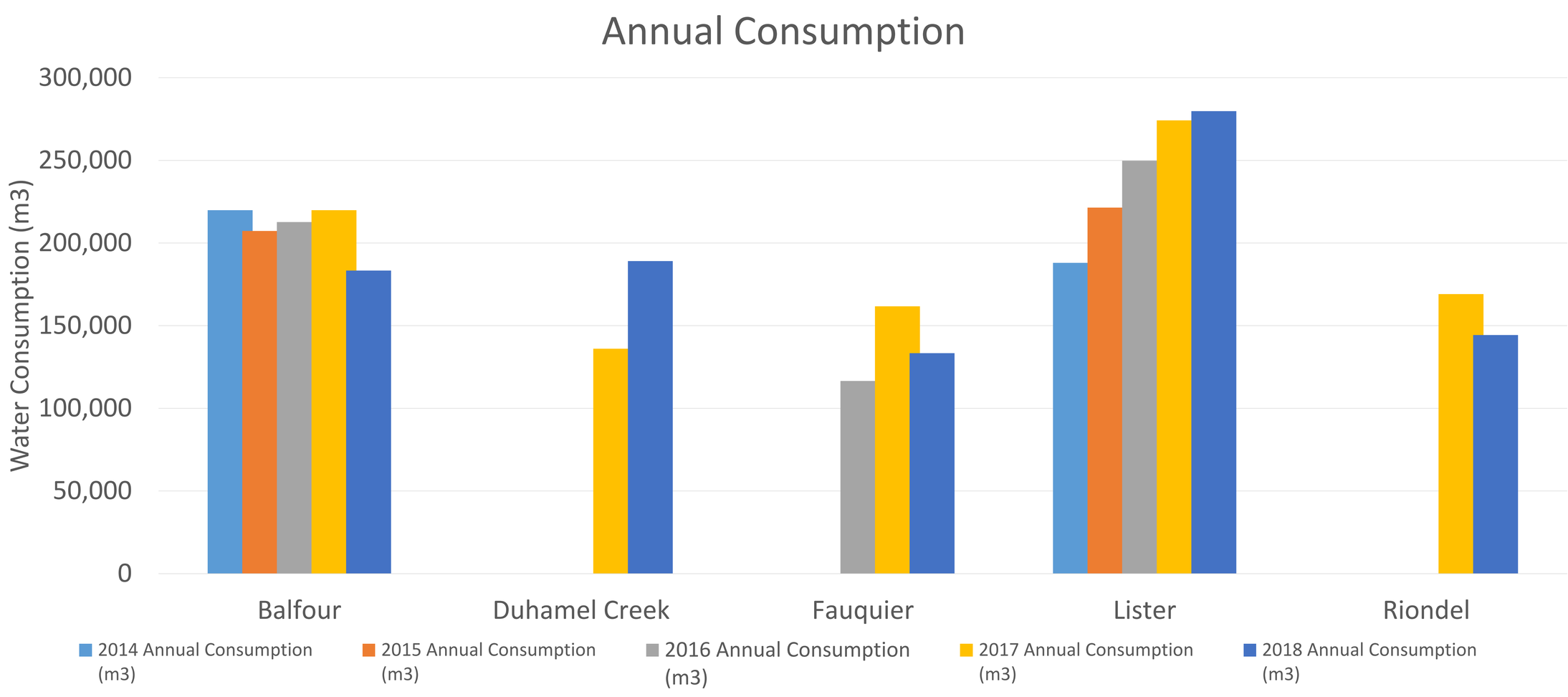
Riondel Water Open House

Riondel Consumption

The total water consumption for Riondel in 2017 was 169,116 cubic meters and 144,322 cubic meters in 2018.



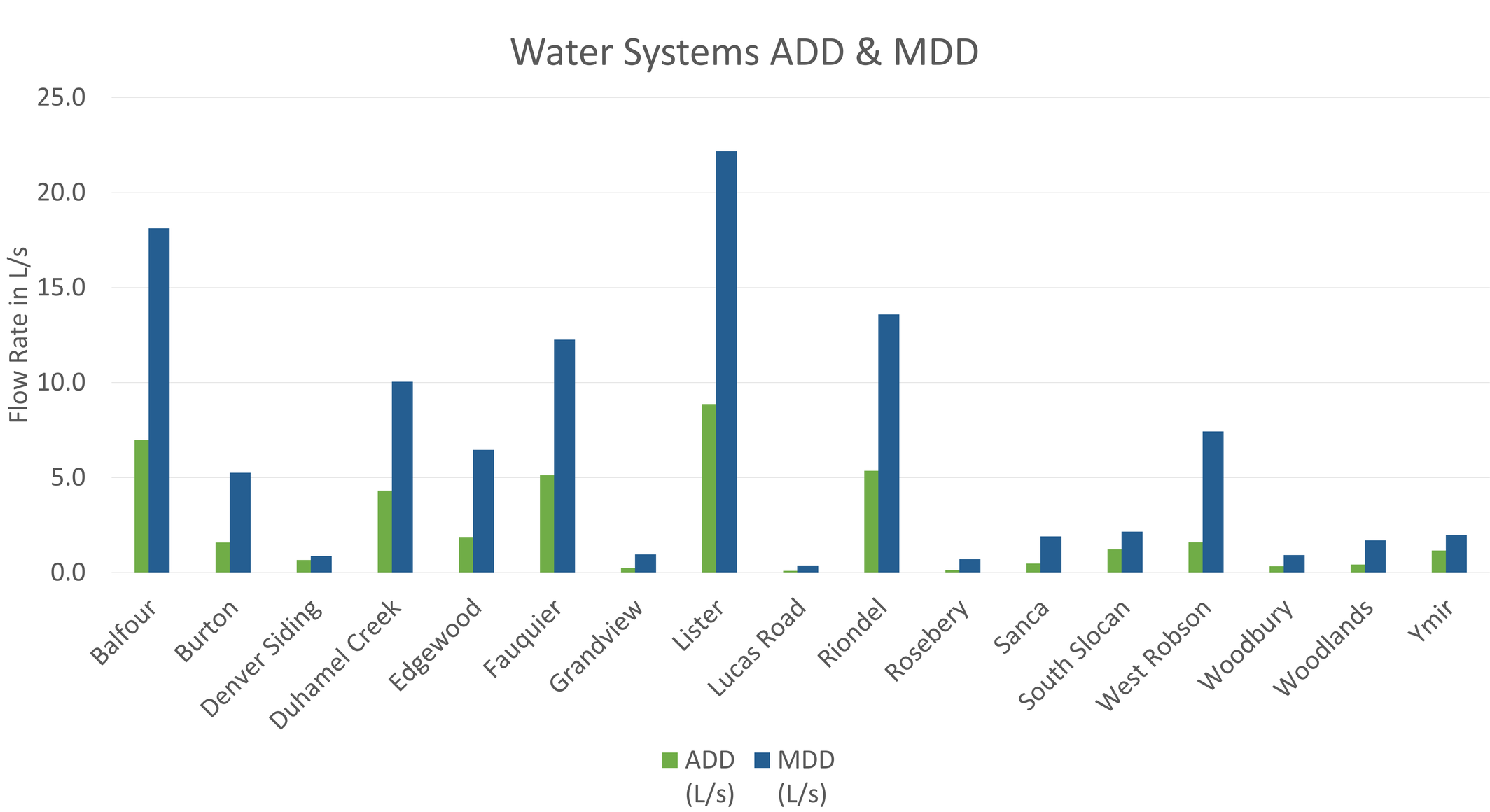
The following chart provides a consumption comparison with other Regional District mid-sized water systems.



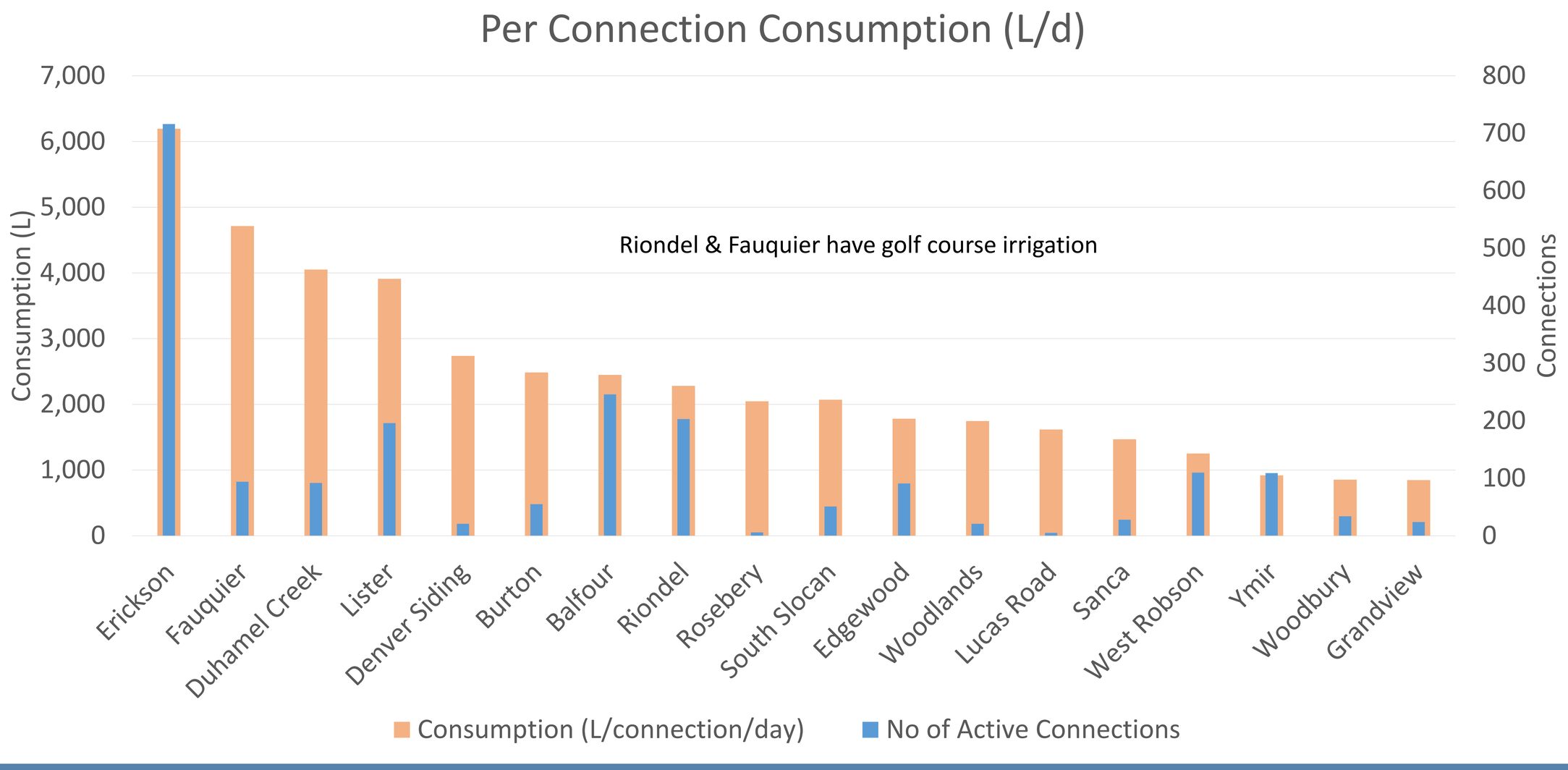
Riondel Water Open House

Riondel Consumption

The following chart provides a comparison of Average Day Demands (ADD) and Maximum Day Demands (MDD) for Regional District Water Systems.

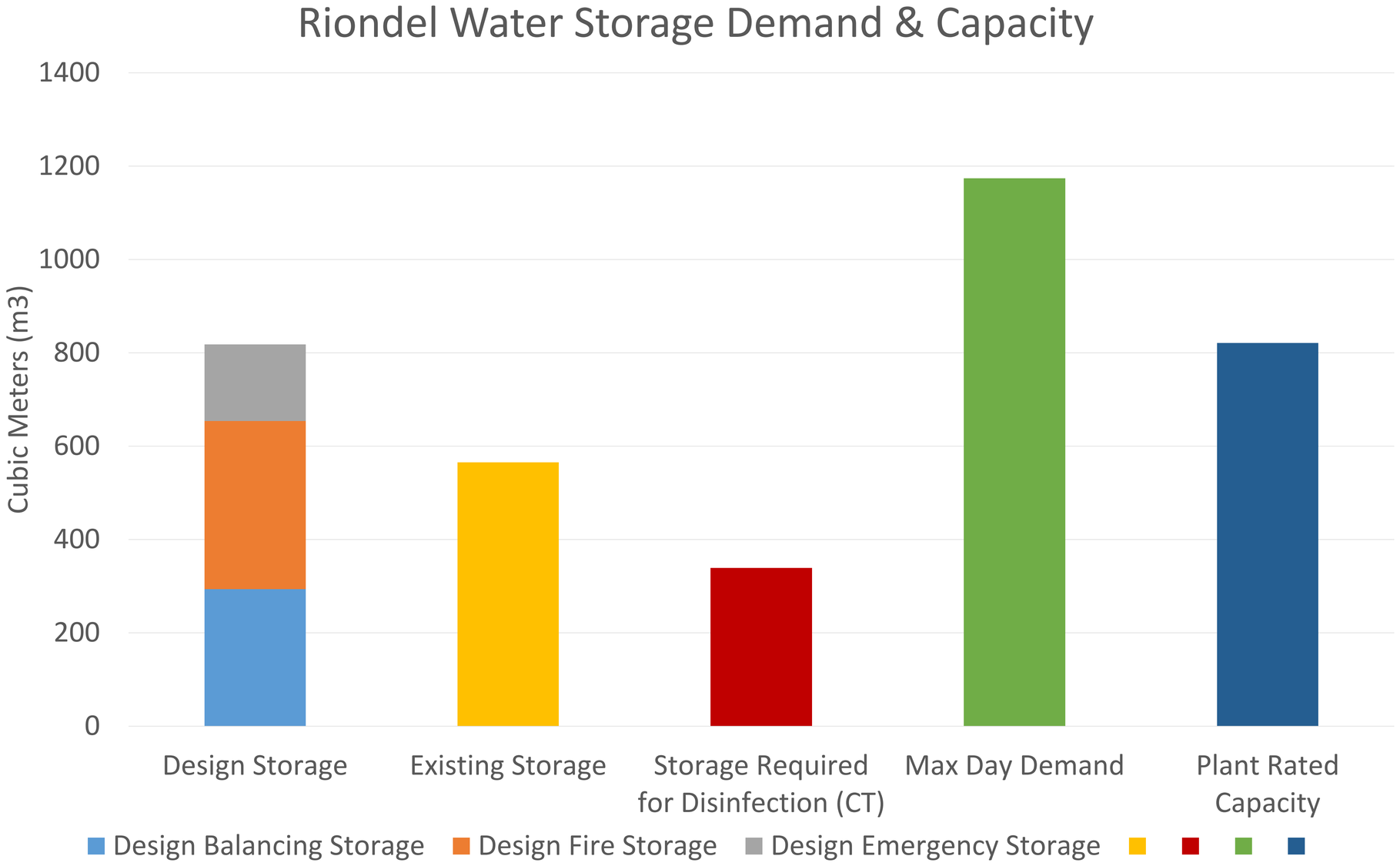


The following chart provides a comparison of per connection consumption per day for Regional District water systems.



Riondel Capacity

The following chart provides a comparison of Riondel water storage, maximum day demand and treatment plant capacity.



- Existing water storage is undersized based on current design standards.
- Although storage is undersized, reservoir meets minimum storage size for a fire rating by Fire Underwriters Survey. Old BC Rural Design Guidelines identified a minimum 114 cubic meters of storage.
- Design storage represents the potential required reservoir size for current water demands.
- Future water demands should be considered, if replaced.
- Based on recent reservoir replacements in Balfour and Ymir, a new reservoir in Riondel might cost $750,000 to $1 million.
- The maximum day demand in 2017 was higher than the plant capacity of 821 m^3.
- In ideal conditions, the plant is capable of 1,123 m^3 per day under emergency flow operation.
- If demand is higher than capacity for more than one day there is not enough storage to make up the difference.

Riondel Water Open House

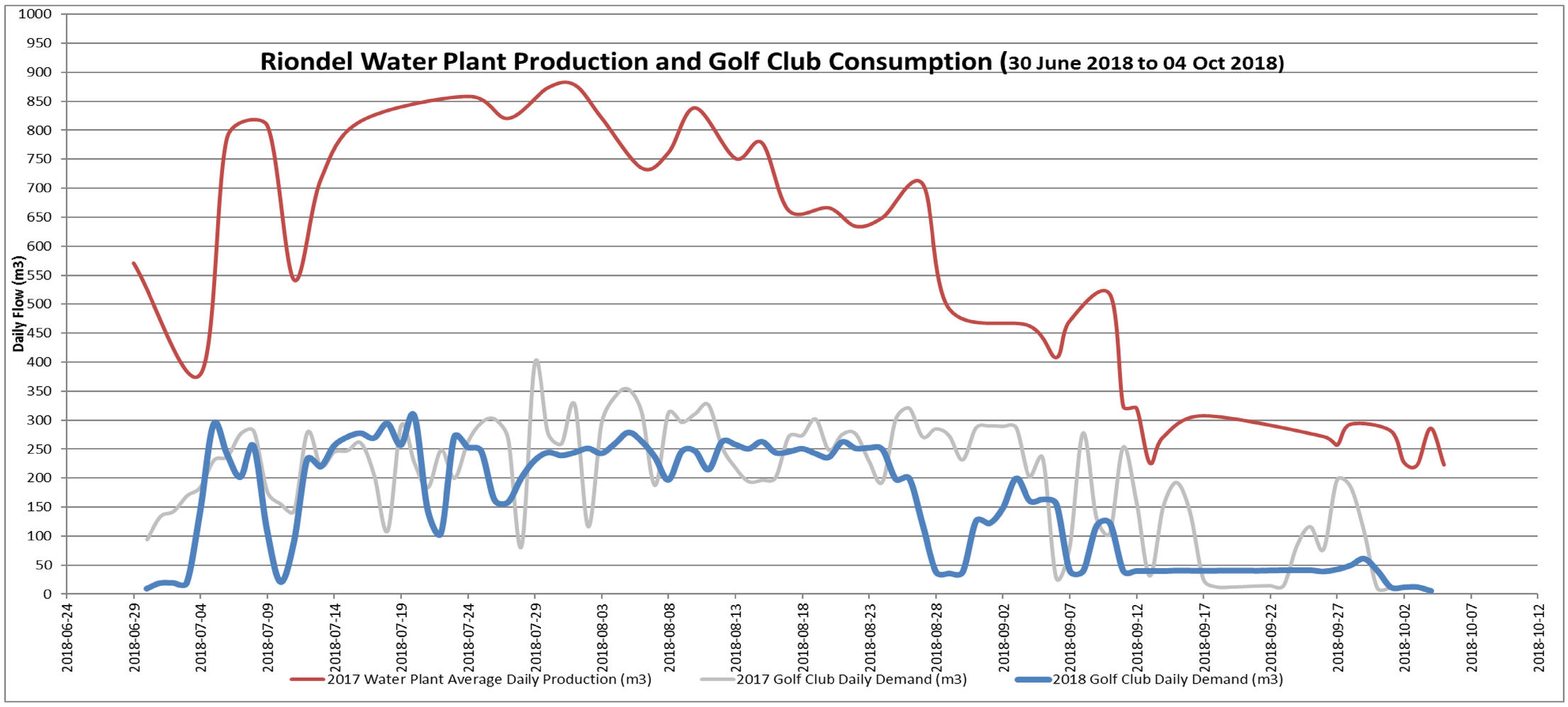
Golf Course Water Consumption

The following table provides a summary of 2017 and 2018 water consumption for the Golf Club and water system.

	2017			
	Consumption (m3)	Golf Course Percentage	Average Per Day (m3)	Peak Day (m3)
Golf Course	23,757		148	446.07
Riondel Water System During Golf Season	103,843	23%	653	1,171
Riondel Water System Year	164,837	14%	454	

	2018			
	Consumption (m3)	Golf Course Percentage	Average Per Day (m3)	Peak Day (m3)
Golf Course	21,695		143	307.83
Riondel Water System During Golf Season	106,085	20%	698	1,037
Riondel Water System Year	148,720	15%	407	

Note 1) 2018 water system consumption was based on meter readings to 06 December 2018, so volume was projected to year end.



- The Golf Club has expressed an interest in finding an alternative irrigation supply for a number of years and are looking into the feasibility of grant funding.
- The Golf Club provides $13,454 (18.6 %) of the total $72,318 water system user fees.

Riondel Water Open House

Riondel Water Financial Plan

(Revised After Open House)

S241 **Water Utility-Area A (Riondel)**

SYSTEM INFORMATION AND RATES

			No.	2018	2019	2020	2021	2022	2023
		Active Accounts	203						
		Service Charges % Increase		**20%**	**39%**	**3%**	**3%**	**3%**	**3%**
		RIO-COMMERCIAL- BUSINESS	2	521	724	746	768	791	815
		RIO-COMMERCIAL- CAMPGROUND	1	2,586	3,595	3,703	3,814	3,928	4,046
		RIO-COMMERCIAL- FOOD & BEVERAGE	1	905	1,258	1,296	1,335	1,375	1,416
		RIO-COMMERCIAL- GOLF COURSE	1	9,679	13,454	13,858	14,273	14,702	15,143
		RIO-COMMERCIAL- RECREATIONAL SEASONAL	2	323	449	462	476	491	505
		RIO-DWELLING- SINGLE FAMILY- ADDITIONAL	2		0	0	0	0	0
		RIO-DWELLING-MULT FAM-ADDITIONAL DWELLIN	4	521	724	746	768	791	815
		RIO-DWELLING-MULTI FAMILY-FIRST DWELLING	1	521	724	746	768	791	815
		RIO-DWELLING-SINGLE FAMILY	196	521	724	746	768	791	815
		RIO-INSTITUTIONAL- AMBULANCE STATION	1	773	1,074	1,106	1,139	1,174	1,209
		RIO-INSTITUTIONAL- CHURCH	1	521	724	746	768	791	815
		RIO-INSTITUTIONAL- CHURCH SEASONAL	2	323	449	462	476	491	505
		REGIONAL DISTRICT COMMUNITY BUILDING	0	0	0	0	0	0	0
		REGIONAL DISTRICT COMMUNITY CENTER	0	0	0	0	0	0	0
		REGIONAL DISTRICT RECREATIONAL CENTER	0	0	0	0	0	0	0
		REGIONAL DISTRICT RECREATIONAL FIELD	0	0	0	0	0	0	0
		Parcel Tax % Increase			**0%**	**0%**	**0%**	**0%**	**0%**
		Frontage Tax - Ranges from 75 to 166 per customer							

REVENUE

Account			2018 Budget	2018 Est Year End	2019 Budget	2020 Budget	2021 Budget	2022 Budget	2023 Budget
41010		Requisitions	47,211	47,211	47,211	47,211	47,211	47,211	47,211
42020		Sale of Services	0	0	0	0	0	0	0
42030		User Fees	121,537	120,760	168,873	173,939	179,157	184,532	190,068
43030		Community Works Grants (Internal)	0	0	0	0	0	0	0
45000		Transfer from Reserves	34,000	0					
45000		- Community Services Building Reserves		34,855					
45000		- RES 162 Riondel Water Reserve			50,000	0	55,000	0	0
49100		Prior Year Surplus	(4,175)	(3,643)	(12,633)	(0)	(0)	(0)	(0)
Revenue			198,573	199,183	253,450	221,149	281,368	231,742	237,279

OPERATING EXPENSES

Account			2018 Budget	2018 Est Year End	2019 Budget	2020 Budget	2021 Budget	2022 Budget	2023 Budget
51010		Salaries	26,500	31,952	30,000	30,600	31,212	31,836	32,473
51020		Overtime	2,000	880	1,000	1,020	1,040	1,061	1,082
51030		Benefits	7,420	8,215	8,871	9,048	9,229	9,414	9,602
51050		Employee Health & Safety	0	75	100	102	104	106	108
52010		Travel	0	611	50	51	52	53	54
52020		Education and Training	0	560	500	510	520	531	541
				60					
53020		Admin, Office Supplies & Postage	100	44	100	102	104	106	108
53030		Communication	1,205	1,198	1,222	1,246	1,271	1,297	1,323
53050		Insurance	2,064	3,558	3,629	3,702	3,776	3,851	3,928
53080		Licence & Permits	644	541	552	563	574	585	597
54010		Legal	0	2,282	0	0	0	0	0
54030		Contracted Services	6,001	7,434	8,000	8,160	8,323	8,490	8,659
55010		Repairs & Maintenance							
		- Repairs & Mainteance	4,335	4,822	3,500	3,570	3,641	3,714	3,789
55010		- Inventory Write Offs	0	2,085	2,085	2,085	2,085	2,085	0
55020		Operating Supplies	1,186	178	200	204	208	212	216
55025		Chemicals	6,289	5,350	5,457	5,566	5,677	5,791	5,906
55030		Equipment	451	955	800	816	832	849	866
55040		Utilities	4,897	3,952	4,031	4,112	4,194	4,278	4,363
55050		Vehicles	629	998	1,000	1,020	1,040	1,061	1,082
55060		Rentals	0	3,961	0	0	0	0	0
Operating Expenses			63,721	79,710	71,096	72,476	73,884	75,320	74,699

CAPITAL EXPENSES

Account	Work Order		2018 Budget	2018 Est Year End	2019 Budget	2020 Budget	2021 Budget	2022 Budget	2023 Budget
60000	CAP907-100	RIO - Membrane Capacity Upgrade	20,000	0	0				
60000	CAP908-100	RIO - Prefiltration Redundancy & Safety Upgrades	14,000	0					
60000	CAP940-100	RIO - Nissian Frontier - VIN #1N6AD0CW1JN770167		35,449					
60000	CAP945-100	RIO W - 2019 Water Treatment Plant (Interior Health Required Items)			20,000				
60000	CAP944-100	RIO W - 2019 Chemical Room Addition			30,000				
60000	CAP1005-100	Reservoir Valve Chamber & Meter					55,000		
Capital Expenses			34,000	35,449	50,000	0	55,000	0	0

NON-OPERATING EXPENSES

Account	Work Order		2018 Budget	2018 Est Year End	2019 Budget	2020 Budget	2021 Budget	2022 Budget	2023 Budget
56010		Debenture Interest	8,125	6,344	6,344	6,344	6,344	6,344	6,344
56020		Debenture Principal	6,003	6,003	6,003	6,003	6,003	6,003	6,003
59000		Contribution to Reserve	23,273	23,273	32,435	47,077	49,177	51,371	55,748
59500		Transfer to Other Service							
	OPR322-112	Fleet	1,260	1,260	1,512	1,542	1,573	1,605	1,637
	OPR317-113	WaterSmart Program			0	0	0	0	0
	OPR322-117	Operator Admin	19,397	16,982	13,955	14,234	14,519	14,809	15,105
		Transfer to Other Service - Community Services Building Reserves - Truck Loan Interest			430	340	247	152	54
		Transfer to Other Service - Community Services Building Reserves - Truck Loan Principal			3,300	3,390	3,483	3,578	3,676
59510		Transfer to Other Service - General Admin. Fee	7,288	7,288	11,410	11,638	11,871	12,108	12,350
59520		Transfer to Other Service - IT Fee	2,704	2,704	4,690	4,784	4,879	4,977	5,077
59550		Transfer to Other Service - Environmental Services Fee	32,802	32,802	52,276	53,322	54,388	55,476	56,585
Non-Operating Expenses			100,852	96,656	132,355	148,674	152,484	156,422	162,579
Total Service			0	(12,633)	(0)	(0)	(0)	(0)	0

RESERVES

		2018	2019	2020	2021	2022	2023
	Balance Previous Year						
	RES 162 Riondel Water Reserve	53,462	77,304	60,546	108,229	103,488	155,894
	RES 163 Riondel Water Capital Utility	34	34				
	Total	53,496	77,338	60,546	108,229	103,488	155,894
	Interest (Assumed 1%)	535	773	605	1,082	1,035	1,559
	Contribution	23,273	32,435	47,077	49,177	51,371	55,748
	Withdrawal	0	(50,000)	0	(55,000)	0	0
		77,304	60,546	108,229	103,488	155,894	213,201

2017Asset Management Plan Identified Contribution to Reserves

25 Year	**82,338**	
100 Year	**87,590**	

	2018	2019	2020	2021	2022	2023
Cumulative Required Contribution to Reserves	82,338	164,676	247,014	329,352	411,690	494,028
Reserves Annual Contribution Deficit	(59,065)	(49,903)	(35,261)	(33,161)	(30,967)	(26,590)
Reserves Cumulative Contribution Deficit	(59,065)	(108,968)	(144,229)	(177,390)	(208,357)	(234,947)

Riondel Water Open House

Asset Management Planning

Reserves Budget	2018	2019	2020	2021	2022	2023
Balance Previous Year						
RES 162 Riondel Water Reserve	53,462	77,304	60,546	108,229	103,488	155,894
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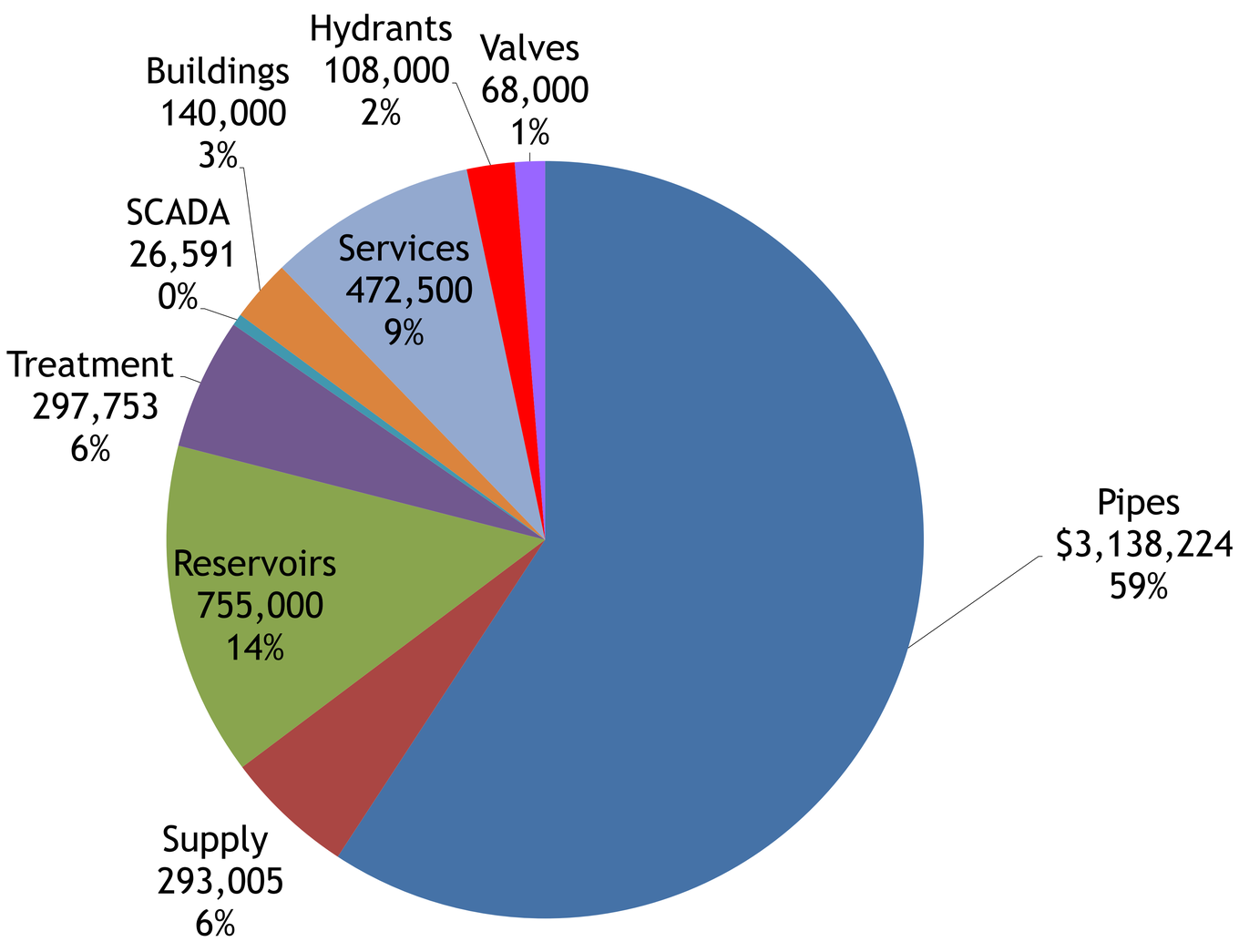
The total value of the infrastructure and the value of each asset category is shown here in 2017 dollars.

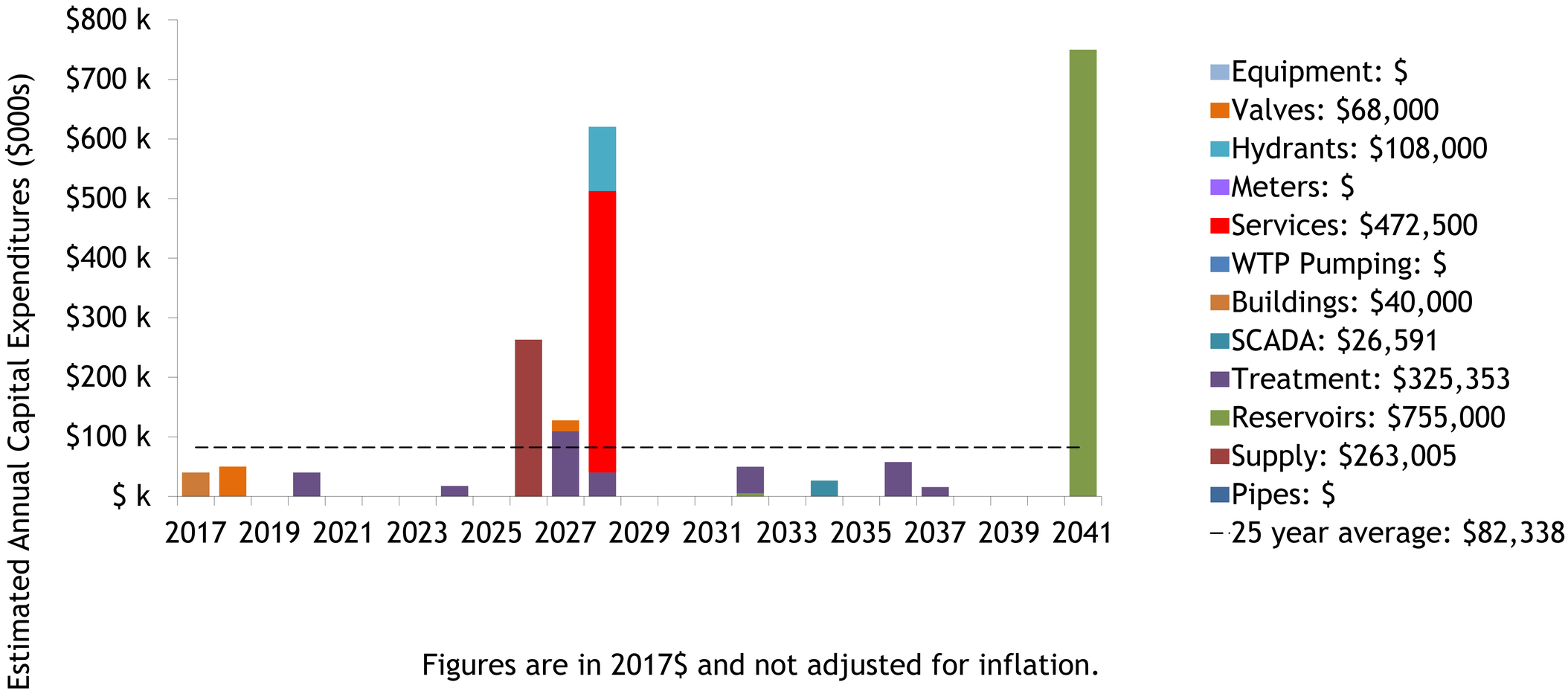
Figure 1: Riondel 2017 WATER Assets Replacement Value: $5,299,072



Riondel Water Open House

Water Treatment Funding & Costs

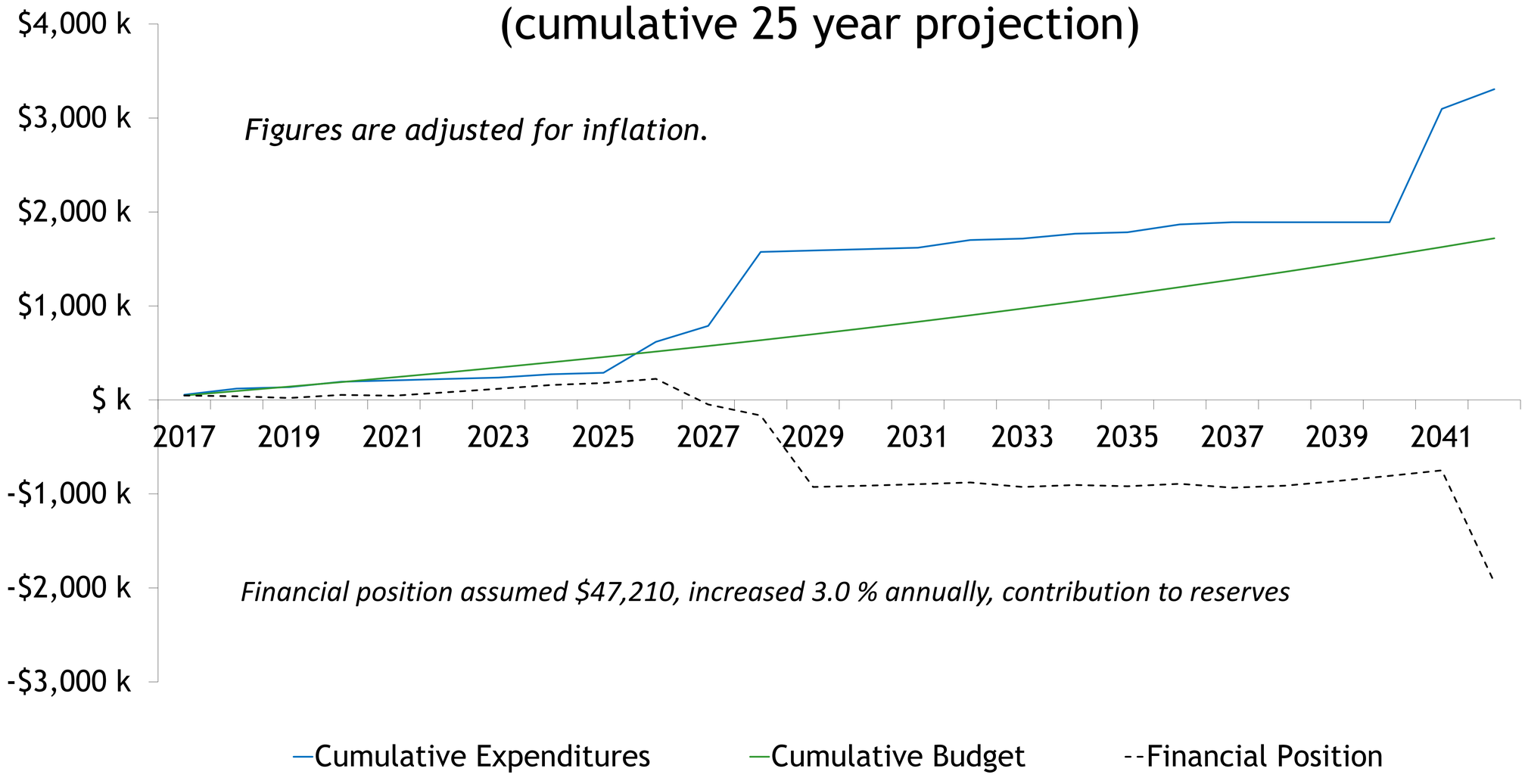
Figure 3: Riondel 25 Year Asset Replacement Schedule



Figures are in 2017$ and not adjusted for inflation.

- Distribution system constructed mostly in 1977 and Aspen Rd in 2004.
- Reservoir constructed in 1992
- Treatment Plant commissioned in 2015

Figure 7: Riondel WATER Comparing Expenditures and Funding (cumulative 25 year projection)

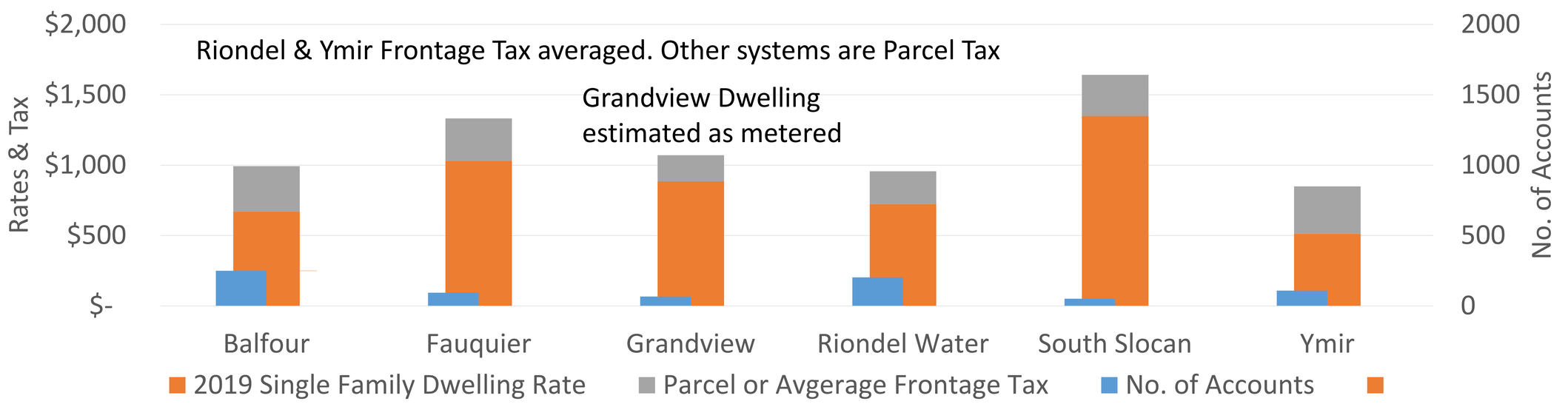


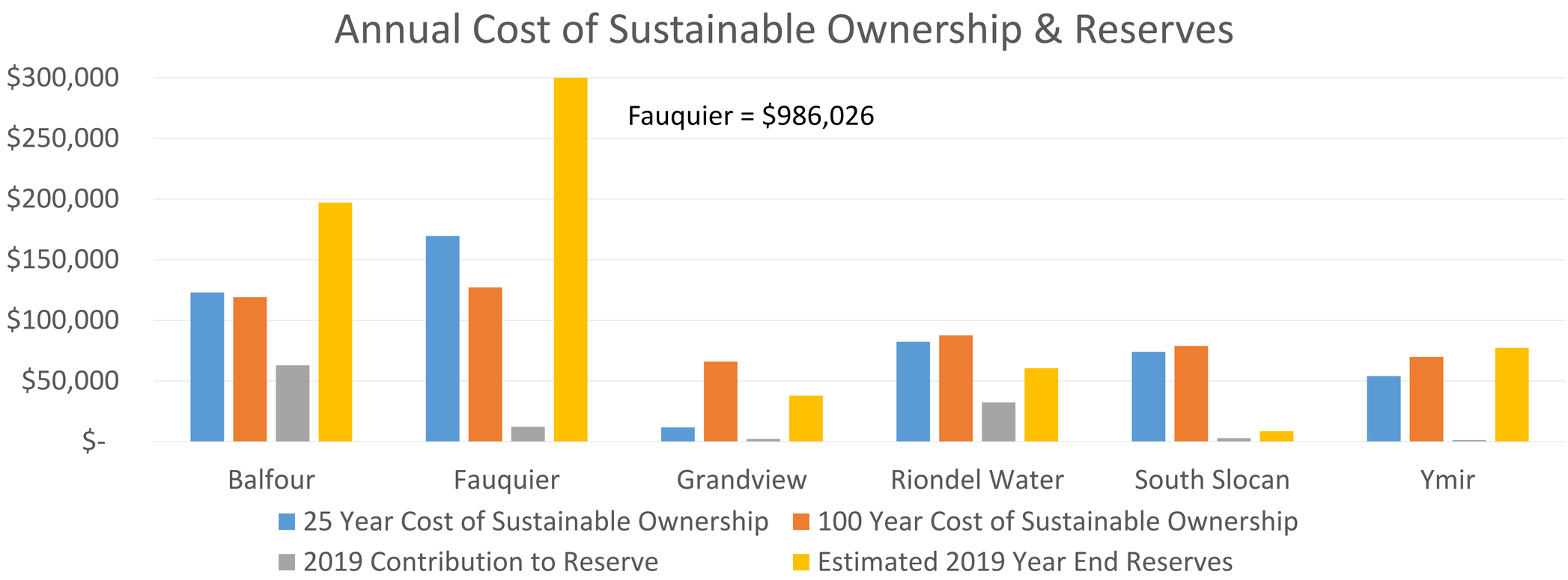
Riondel Water Open House

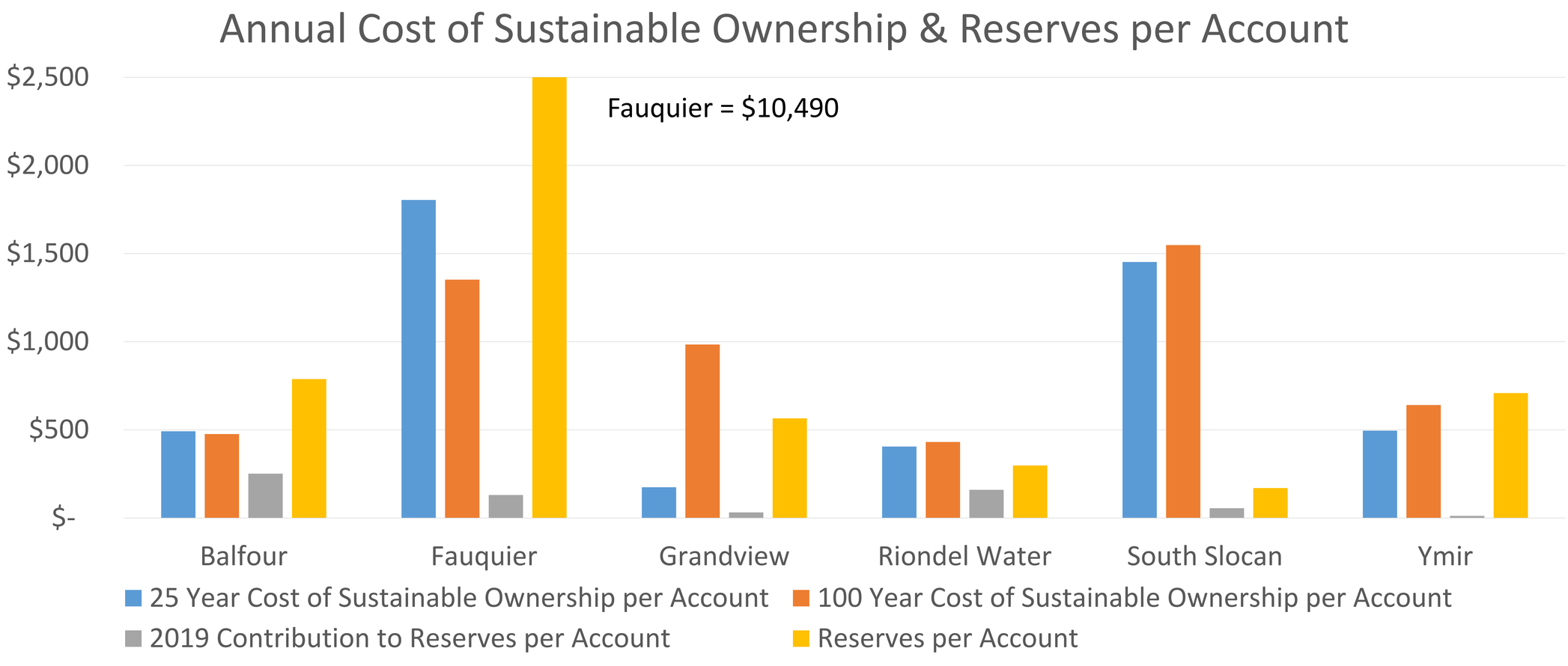
Asset Management Planning

Annual Cost of Sustainable Ownership & Reserves

Water Systems No of Accounts, Single Family Dwelling Rate & Water Tax







September 16, 2019

Riondel Water Open House

Do We Have Your Correct Mailing Address for Billing and Notices?

- Regional District addressing for water billing and notices comes from BC Assessment.
- A number of addresses in our billing system indicate “GD” or General Delivery.
- To change your address, you will have to change your address with BC Assessment.

September 16, 2019