



# BAYSHORE VILLAGE WATER WORKS

2019 Water Quality Summary Report



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# 1 INTRODUCTION

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The Bayshore Village Water Works (Water Works) serves the Bayshore Village residential community, consisting of 343 lots located on Lots 21 to 25, Concession VI, as well as 29 lots on Southview Drive, and in the future, 10 lots on Block H.

A total of 340 lots were connected in 2019, serving an estimated population of 884 residents (based on the Township of Ramara's average population of 2.6 people per dwelling).

This report provides a description of the Water Works and summarizes the monitoring program, water quality, water consumption, chemical usage, system repairs, and maintenance completed in 2019.

This report also summarizes the Water Works compliance status with the Safe Drinking Water Act (SDWA), the Ministry of the Environment and Climate Change (MECP) Drinking Water Works Permit (DWWP) and the MECP Municipal Drinking Water License (MDWL). This annual report summary was prepared for presentation to Township of Ramara Council as required by Ontario Regulation 170/03 – Drinking Water Systems (O. Reg. 170/03), Schedule 22.

## 2 APPROVALS

The Water Works is approved under DWWP No. 147-204, Issue No. 2 dated July 20, 2016 and MDWL No. 147-104, Issue No. 2 dated July 20, 2016. Table 1 summarizes all approvals issued since 1977.

Table 1: Summary of Approvals

Date Issued	Approval Number	Description
July 20, 2016	147-104 Issue No. 2	Municipal Drinking Water License renewal.
July 20, 2016	147-204 Issue No. 2	Drinking Water Works Permit renewal.
February 24, 2015	5467-9TFT9U	Permit to Take Water renewal.
August 4, 2011	147-104 Issue No. 1	MDWL. Revokes and replaces C of A # 2806-6SHRJG.
August 3, 2011	147-204 Issue No. 1	DWWP. Revokes and replaces C of A # 2806-6SHRJG.
September 18, 2006	2806-6SHRJG	Revokes and replaces C of A # 7672-5W2SMC and C of A Air #2351-5KHST7. Approves upgrades to chemical feed system.
February 23, 2004	7672-5W2SMC	Approves upgrades and extends upgrades deadline to December 31, 2004. Revokes # 9881-5KNPA7.
March 18, 2003	9881-5KNPA7	Removes hydrogeological report requirements and adds groundwater supply chlorination requirements.
December 19, 2002	7854-56WQ3K	Notice: Extends deadline for upgrades.
February 1, 2002	7854-56WQ3K	Requires continuous analyzers to be installed. Revokes # 4405-53YQ7X.
January 14, 2002	4405-53YQ7X	Consolidated C of A. Revokes # 7-0993-97-006.
May 1, 2000	7-0993-97-006	Amendment: Rated capacity of 1,243.8 m <sup>3</sup> /day; additional well.
September 10, 1997	7-0993-97-006	Rated capacity of 654 m <sup>3</sup> /day for full development. Revokes # 7-0205-77-006.
June 1, 1977	7-0205-77-006	Approval for water supply for 200 lots, including 2 wells, Water Works building, reservoir and water mains.

Permit to Take Water No. 5467-9TFT9U, issued on February 24, 2015. The PTTW allows the taking of 1,244 m<sup>3</sup>/day and the following maximum rates and amounts per well:

	<u>Maximum Rate</u>	<u>Amount/Day</u>
Well No. 3	409 L/min	196,300 L/d
Well No. 4	1,682 L/min	807,500 L/d
Well No. 5	500 L/min	240,100 L/d

## 3 DESCRIPTION OF WATER WORKS

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The Water Works consists of three wells, a building housing chlorination equipment, three high lift pumps, metering equipment, a treated water reservoir, and an emergency generator. The Water Works building and wells are located on Bayshore Drive. The following sections describe the facilities as they operated in 2019.

### 3.1 WATER SOURCE

The Bayshore Village Water Works utilizes three deep wells:

- Well No. 3 is located 2 m southeast of the Water Works building. A 408 L/min (90 lpm) 7.5 hp submersible pump is set in a 205 mm diameter steel casing at a depth of 17 m.
- Well No. 4 is located 60 m north of the Water Works building. A 1,680 L/min (370 lpm) 7.5 hp submersible pump is set in a 203 mm diameter steel casing at a depth of 13.1 m.
- Well No. 5 is located 144 m northeast of the Water Works building. A 498 L/min (110 lpm) 7.5 hp submersible pump is set in a 203 mm diameter steel casing at a depth of 13.1 m.

### 3.2 WATER TREATMENT

1. Raw water is injected with sodium hypochlorite for primary disinfection and discharged to the reservoir located under the building. The reservoir provides the necessary contact time for disinfection, as well as water storage to meet the peak hour demand of the development. High lift pumps transfer the water from the reservoir to the distribution system.
2. Each well line is fitted with a raw water magnetic flow meter that provides a 4-20 mA signal for recording on the paperless chart recorder the daily average flow rate, the total daily flow and the peak instantaneous flow rate taken from each well.
3. A pump control panel allows the operators to select the duty and stand-by wells. Each well can be run individually or with one another. Each well pump is equipped with an hour meter to log the number of hours of operation. The pump control panel also allows the operators to select the duty and stand-by high lift pump.
4. Three chemical feed systems, one for each well, are used to inject sodium hypochlorite into the raw water lines. Each system has one chemical solution tank with secondary containment and two chemical feed pumps, one duty and one standby with automatic switch over in case of duty pump failure.

5. Treated water discharges into a reservoir located under the Water Works building. The concrete underground tank has a volume of 112,000 L (25,000 IG, 6.1 m by 6.1 m by 3.35 m).
6. A stainless steel flow dispersion header in the reservoir ensures the full contact volume is utilized.
7. Three vertical turbine pumps equipped with variable speed drives and individual pressure transducers transfer the treated water from the reservoir to the distribution system. Each 7.5 HP Berkeley pump has a capacity of 9.1 L/s (120 lpm).
8. A pressure switch is utilized on the distribution piping for a low-pressure alarm.
9. Continuous water quality in-line analyzers monitor the free chlorine residual, pH and turbidity of the treated water before it enters the distribution system. The analyzers are logged by a paperless chart recorder and have alarm set points to notify the operators of adverse water quality results.
10. A treated water magnetic flow meter provides a 4-20 mA signal for recording on the paperless chart recorder the daily average flow rate, the total daily flow and the peak instantaneous flow rate entering the distribution system.

### 3.3 EMERGENCY GENERATOR

An 80 kW diesel powered generator is located in the Water Works building, to supply power during hydro power outages. The generator has sufficient capacity to run the entire Water Works. The generator can operate for 24 hours at maximum capacity when its fuel tank is full.

### 3.4 WATER DISTRIBUTION SYSTEM

The distribution system consists of approximately 7,200 m of 150 mm PVC diameter watermain, 35 - 150 mm main valves, and 28 fire hydrants which are utilized for flushing the distribution system. Four sample stations are installed throughout the distribution system for testing purposes.

## 4 WATER QUALITY MONITORING

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### 4.1 BACTERIOLOGICAL SAMPLING AND RESULTS

The Water Works must be operated in such a manner as to meet the treatment requirements specified in Ontario Regulation 170/03 and Ontario Regulation 169/03.

Appendix A summarizes the sampling and testing requirements in accordance with O. Reg. 170/03.

The sampling locations are as follows:

- Raw water: from each well as it enters the Water Works building
- Treated water: after treatment, just before the water leaves the water works building
- Distribution: at a point in the distribution system that is the furthest from the treatment system. THMs, HAAs and lead are to be sampled at a location that is likely to have an elevated concentration.

Six water samples are taken on a weekly basis for bacteriological testing: one from each of the three wells (raw), one from the treated water at the Water Works (treated), and two at various locations in the distribution system (distribution).

Raw water samples are tested for Total Coliforms, Escherichia coli (E. coli) and background colonies.

Treated and distribution water samples are tested for Total Coliforms, E. coli, Heterotrophic Plate Count (HPC), and background colonies.

All bacteriological tests were performed by the accredited laboratory SGS Lakefield Research Limited.

The results of the water samples are reviewed by the Overall Responsible Operator and kept on file at the Township office. If a treated water or distribution water sample contains Total Coliforms or E. coli, the Spills Action Centre and the Simcoe Muskoka District Health Unit are notified immediately, verbally and in writing. The site is also re-sampled.

In 2019, Environmental Services reported 3 adverse water quality incidents (AWQIs) to the MECP and the local Medical Officer of Health (Simcoe Muskoka District Health Unit). This was due to 2 distribution samples that exceeded the maximum acceptable concentration for total coliforms and 1 distribution sample came back with no data.

Operators immediately initiated corrective actions for all AWQIs as per requirements under O. Reg. 170/03, and all were resolved without incident.



## 4.2 FREE CHLORINE RESIDUAL MONITORING AND RESULTS

In order to provide the required primary disinfection in accordance with MECP's Procedure for Disinfection of Drinking Water in Ontario, an adequate CT value must be maintained. The CT value is the effective disinfectant contact time (T) multiplied by the free chlorine residual (C).

A CT value of 6 is needed to provide 2-log inactivation of viruses, based on a pH range of 6 to 9 and a water temperature of 0.5°C. The effective contact time is determined from the available contact volume, the baffling factor and the rated capacity of the Water Works. The effective contact time is calculated to be 19.1 minutes based on the reservoir's baffle factor of 0.3. Under regular operating conditions at Bayshore Village a minimum free chlorine residual above 0.4 mg/L should be maintained in the treated water to ensure a CT of 6.

Free chlorine residuals at the Water Works building are monitored using a continuous analyzer, to verify free chlorine residuals are maintained within the operation limits of 0.4 mg/L to 4.0 mg/L.

In 2019, free chlorine residuals measured by the continuous analyzer ranged between 0.00 mg/L and 2.46 mg/L. When the continuous analyzer measured free chlorine residual outside of the operation limits, on-duty operators compared the results with those from a hand-held analyzer. The on-duty operator also confirmed all Water Works equipment was operating normally at the time to verify the triggered alarm was a non-reportable event. All measurements recorded outside of the operation limits in 2019 were caused by testing of alarm set points, a short-term power failure, regular maintenance or cleaning and non-reportable alarms. The continuous analyzer was re-calibrated as required. Hand-held measurements of free chlorine residual ranged between 0.64 mg/L and 1.99 mg/L. Free chlorine residuals were therefore maintained above 0.4 mg/L at all times and a CT of 6 was achieved.

Free chlorine residuals in the distribution system are monitored, in accordance with O. Reg. 170/03, Schedule 7. The operator used a portable Hach Chlorine Residual Meter to verify the free chlorine residuals were maintained within the operation limits of 0.2 mg/L to 4.0 mg/L. Free chlorine residuals in the daily water distribution samples ranged between 0.38 mg/L and 1.56 mg/L.

Free chlorine residual monitoring results are summarized in Table 2.

Table 2: 2019 Free Chlorine Residuals (mg/L)

Month	Water Works				Distribution System	
	Continuous Analyser		Hand-held Instrument (Daily)			
	Min*	Max	Min	Max	Min	Max
January	0.01	2.31	0.64	1.99	1.02	1.43
February	0.04	1.99	1.06	1.97	0.79	1.35
March	-0.25	1.83	0.66	1.46	0.38	0.97
April	0.65	2.46	0.70	1.99	0.44	0.94
May	0.55	1.64	0.97	1.32	0.47	1.26
June	0.08	2.01	0.76	1.56	0.51	1.25
July	0.02	1.77	0.95	1.34	0.50	1.18
August	0.01	1.58	0.72	1.40	0.50	0.98
September	0.01	1.82	1.09	1.47	0.72	1.31
October	0.42	2.17	0.64	1.61	0.59	1.56
November	0.00	2.27	0.70	1.70	0.61	1.26
December	0.31	2.04	0.92	1.63	0.64	1.25

\*Low chlorine alarm test or non-reportable event

### 4.3 PHYSICAL/CHEMICAL TESTING RESULTS

#### 4.3.1 Raw Water

A quarterly raw water sampling program was initiated in 2006 to test for major ions, nitrite and nitrate from each well. The intent of the program is to permit trend analysis of the results by a hydrogeologist for future studies pertaining to source water protection for the municipal water supply wells.

The raw water was sampled from Wells No. 3, 4, and 5 and tested in February, May, August, and November of 2019 by SGS Lakefield Research Limited, an accredited laboratory. A full characterization of the physical/chemical quality of the raw water from the Bayshore Village wells was last completed in December 2000 and March 2001. Raw water quality laboratory results for 2019 are summarized in Appendix B.

Raw water quality results observed in 2019 are consistent with results from previous years. Hardness (CaCO<sub>3</sub>) in all well samples exceeded the aesthetic objectives (AO/OG) specified in Table 4 of the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines (June 2003) (ODWS). All samples from Well No. 5 had concentrations of iron exceeding the AO/OG level.

Sodium concentration exceeded 20 mg/L in all samples taken from Wells Nos. 3, 4 and 5 except for the August sample from Well 5. Nitrite and nitrate levels in all wells were below the laboratory method detection limits.

Hand-held measurements of turbidity were in the following ranges:

- 0.23 NTU – 0.53 NTU in Well No. 3;
- 0.16 NTU - 0.31 NTU in Well No. 4; and
- 0.16 NTU - 0.41 NTU in Well No. 5.

#### 4.3.2 Treated Water

SGS Lakefield Research Limited tested treated water quality in February, May, August and November in 2019. Treated water was tested for Nitrate and Nitrite; and distribution water was tested for Trihalomethanes (THMs), Haloacetic Acids (HAAs) and Lead.

Treated water quality laboratory results for 2019 are summarized in Table 3.

Treated water quality met the specifications in O. Reg. 169/03, Schedule 2, and the AO/OG of the ODWS.

Table 3: 2019 Treated Water Quality Laboratory Results

Parameter	Feb	May	Aug	Nov	MAC
Nitrite (mg/L)	<0.003	<0.003	<0.003	<0.003	1
Nitrate (mg/L)	0.011	0.010	0.012	0.010	10
Nitrate + Nitrite (mg/L)	0.011	0.010	0.012	0.010	10
Lead (Distribution) (µg/L)			.52		10
THM (total) (µg/L) (Distribution)	47	56.1	30.6	44.2	-
THM (Distribution) (µg/L)	45.8	50.2	47.3	44.5	100*
HAA (total) (µg/L) (Distribution)	6.4	8.1	6.1	7.5	-
HAA (Distribution) (µg/L)	8.9	9.38	8.05	7.0	80*

\* Four Quarter Running Average

AO/OG – Aesthetic Objective/Operational Guideline

MAC – Maximum Acceptable Concentration

##### 4.3.2.1 Lead

In accordance with the lead testing requirements of O. Reg. 170, Schedule 15.1-5 (10), treated water in the distribution system was tested for lead, alkalinity and pH in March and August 2019. All parameters were within the AO/OG and MAC of the ODWS. The laboratory results are summarized in Table 4.

Table 4: 2019 Lead Testing Results

Date	Location	pH	Alkalinity (mg/L)	Lead (ug/L)
March 11, 2019	Sample Station Hayloft	7.58	304	0.01
March 11, 2019	Sample Station #66	7.56	288	0.02
August 21, 2019	Sample Station Hayloft	7.24	270	0.13
August 21, 2019	Sample Station #66	7.24	271	0.03
August 21, 2019	Sample Station Misty	7.27	272	0.52

Maximum Acceptable Concentration for Lead: 10 ug/L

Operational Guideline for Alkalinity: 30-500 mg/L

Operational Guideline for pH: 6.5-8.5

#### 4.3.2.2 Turbidity

Treated water turbidity was monitored by the continuous analyzer. Measurements ranged from 0.0 NTU to 2.04 NTU. Turbidity readings that were outside the operating range of 0.0 NTU to 1.0 NTU occurred during routine maintenance (continuous analyzer cleaning and calibration), or were caused by air bubbles in the treated water, or failure of the turbidity meter wiper.

#### 4.4 WELL LEVEL MONITORING

Static water levels in the water supply wells were monitored by continuous water level recorders beginning in 2016.

## 5 WATER USAGE

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### 5.1 WATER CONSUMPTION AND CHEMICAL USAGE

The average water consumption in Bayshore Village during 2019 was 132.8 m<sup>3</sup>/day, as shown in Table 5. This corresponds to an estimated per capita average water consumption of 150 L/day. A maximum daily demand of 277 m<sup>3</sup>/day was measured in June, which corresponds to approximately 22% of the system's rated capacity of 1,244 m<sup>3</sup>/day. Sodium hypochlorite usage in 2019 is also summarized in Table 5.

Total annual water consumption in 2019 was 12% less than in 2018. A summary of the average daily demand (ADD), maximum daily demand (MDD) and the three year (2017 to 2019) historical averages and maximums is presented in Table 6.

Table 5: 2019 Water Consumption and Chemical Usage

Month	Water Consumption				Sodium Hypochlorite Usage* (L)
	Total (m <sup>3</sup> )	Average Daily (m <sup>3</sup> )	Maximum Daily (m <sup>3</sup> )	Minimum Daily (m <sup>3</sup> )	
January	3,519	113.5	160	55	192.71
February	3,636	129.9	159	86	190.46
March	1,989	64.2	123	0	143.62
April	3,708	123.6	171	91	172.29
May	4,230	136.5	177	104	183.77
June	4,250	141.7	224	111	187.80
July	5,568	179.6	235	147	256.28
August	5,557	179.3	277	134	261.42
September	4,244	141.5	185	120	204.21
October	4,723	152.4	241	110	219.84
November	3,556	118.5	166	95	175.41
December	3,491	112.6	134	94	173.99
<b>Total</b>	<b>48,471</b>				<b>2,361.81</b>
<b>Average</b>		<b>132.8</b>			
<b>Min./Max.</b>			<b>277</b>	<b>0</b>	

Treated water flow meter recalibrated in January, 2019

\* Total volume of Sodium Hypochlorite from three chlorination tanks

Table 6: Bayshore Village Water Works Historical Demands

Year	No. of Connections	ADD (m <sup>3</sup> /day)	MDD (m <sup>3</sup> /day)	Rated Capacity (m <sup>3</sup> /day)	Per Capita Consumption (L/p/day)	
					Average	Maximum
2008	304	263	479	1,244	333	606
2009	306	274	542	1,244	343	682
2010*	306	218	506	1,244	274	636
2011	307	172	419	1,244	215	525
2012*	318	155	318	1,244	188	384
2013*	319	150	355	1,244	181	428
2014	319	161	307	1,244	195	370
2015*	320	174	286	1,244	209	344
2016	322	170	332	1,244	203	397
2017	328	152	238	1,244	178	279
2018	335	150	316	1,244	172	362
2019	340	133	277	1,244	157	313
<b>3 Yr Avg / Max</b>		<b>145</b>	<b>316</b>		<b>169</b>	<b>362</b>

\*Excluding pipe leaks/breaks & system flushing

## 5.2 LAWN WATERING BAN

In 2005 through Bylaw No. 2005.72, the Township of Ramara established watering restrictions for non-domestic water use, such as lawn watering. Residents are permitted to water their lawns between the hours of 6:00 a.m. and 8:00 a.m., and 7:00 p.m. and 9:00 p.m., on alternate days; even numbered houses on even numbered days and odd numbered houses on odd numbered days. A full watering ban is required if water demands reach 80% of the PTTW maximum daily rate, which corresponds to 995 m<sup>3</sup>/day.

The maximum daily water flow was 277 m<sup>3</sup>/day in 2019, therefore no watering bans were implemented for Bayshore Village.

## 5.3 SYSTEM RESERVE CAPACITY

In accordance with MECP Procedure D-5-1, the reserve capacity is calculated by the following formula:

**Reserve Capacity = Design Flow – Committed Flow**

Design flow is the maximum permissible flow approved by the MDWL and/or PTTW. Bayshore Village Water Works' maximum day rated capacity is 1,244 m<sup>3</sup>/day.

The committed flow is the total expected water demand from the existing and proposed connections based on the previous three years of data. The committed number of service connections is 382. The three-year (2017-2019) maximum per capita water consumption was 362 L/p/day. At this water consumption rate, the committed flow is 359 m<sup>3</sup>/day.

Therefore, the calculated reserve capacity is 885 m<sup>3</sup>/day.

# 6 OPERATION AND MAINTENANCE

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## 6.1 SYSTEM INSPECTION

The water system is inspected annually by the Ministry of Environment, Conservation and Parks (MECP) to confirm compliance with MECP legislation and authorizing documents (the DWWP and MDWL), as well as evaluating conformance with Ministry drinking water-related policies and guidelines. The physical inspection took place on April 18, 2019 with the inspection review period of May 4, 2018 – April 18, 2019.

There were no issues of non-compliance with regulatory requirements identified during the inspection review period.

## 6.2 SUMMARY OF MAINTENANCE AND REPAIRS

Throughout the year, regular maintenance was completed at the Water Works such as cleaning and calibrating the chlorine and turbidity analyzers, cleaning the chlorine pumps, injectors and lines, and responding to power failures.

All flow meters were checked for calibration by a qualified technician in January 2019.

Repairs and regular maintenance completed during 2019 were as follows:

- Replace battery in UPS for SCADA computer (\$200)
- Install new magnetic flow meter and repair piping on well #3. (\$5000)
- New pressure transducer distribution pump #5 (\$600)
- Replace 2 Service lines under Bayshore Drive (\$6000)

## 6.3 SUMMARY OF UPGRADES AND IMPROVEMENTS

The following upgrades and improvements were completed in 2019:

No new equipment installed.

## 6.4 PUBLIC COMPLAINTS

No complaints were received in 2019.

## 7 WATER WORKS AND OPERATOR LICENSES

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The Water Works has been classified in accordance with O. Reg. 435/93 as:

- Water Distribution and Supply Subsystem Class II (Certificate No. 2353 issued October 27, 2005)

The MECP Water Works number is 220012724. The Water Works is categorized as a Large Municipal Residential system.

A summary of the facility operators in 2019 and their level of certification are listed in Table 7.

Table 7: Certified Operators

Operator	Water Treatment Class	Licence No./ Expiry Date	Water Dist. Class	Licence No./ Expiry Date
Dave Readman	Class II	12460 July 31.21	Class II	13530 July 31.21
Donald O'Connell	Class II	53308 Feb 28.23	N/A	N/A
Rob Smith	Class III	53310 Feb 28.23	Class III	96079 Feb 28.23
Nicholas Leroux	Class III	68579 July 31.21	Class III	83999 Mar 31.20
Joe Foley	Class II	87270 Aug 31.21	N/A	N/A
Kyle Readman	Class I	102761 Oct. 31.21	N/A	N/A

The Operators attended workshops, seminars and training throughout the year to ensure they maintain and enhance their knowledge pertaining to the operation of drinking water systems and remain knowledgeable on current trends in the industry.

Each operator is mandated by Ontario Regulation 128/04 under the Safe Drinking Water Act to complete the applicable number of required training hours over a 3-year period in order to renew their licence.



## 8 COMPLIANCE STATUS

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The MECP conducted an inspection of the Water Works on April 18, 2019. No issues of non-compliance were identified in the inspection. No Provincial Officer's Orders were issued in conjunction with this inspection.

The Water Works adhered to the sampling and testing requirements of the Safe Drinking Water Act and the Municipal Drinking Water Licence. A summary of minimum sampling and testing frequencies is listed in the corresponding water works' Operations and Maintenance Manual.

The Bayshore Village Water Works operated in accordance with the DWWP, MDWL and PTTW during 2019. Based on the 2019 treated water quality test results, at no time were the residents of Bayshore Village at any health risk. All treated water samples tested below the maximum acceptable concentrations for all microbiological and chemical parameters, as specified in O. Reg. 169/03, Schedules 1 and 2.

The annual report required by Ontario Regulation 170/03, Schedule 11 was made available to the public on the Township of Ramara website on February 28, 2020. A copy of the report is included in Appendix C.

APPENDIX A:  
Schedule for required sampling

## Schedule for required sampling

Frequency	Location		
	Raw Water	Treated water	Distribution
Continuous		Free Chlorine Residual Turbidity	
Daily			Free Chlorine Residual
Weekly	<b>Total Coliforms</b> (each well) <b>E. Coli</b> (each well)	<b>Total Coliforms</b> <b>E. Coli</b> <b>HPC or background</b>	<b>Total Coliforms</b> (all samples) <b>E. Coli</b> (all samples) <b>HPC or Background</b> (25% of samples)
Monthly	<b>Turbidity</b> (each well via hand held)		
Every 3 Months	Colour Major Ions Nitrite Nitrate	<b>Nitrate</b> <b>Nitrite</b> Colour Iron Manganese	<b>THMs</b> <b>HAAs</b>
Every 12 Months			<b>Alkalinity*</b> <b>Field pH*</b>
Every 36 Months		<b>Inorganics (Sch. 23)</b> <b>Organics (Sch. 24)</b>	<b>Lead*</b> (Schedule 15.1, Reduced Sampling of dist. System and private residences)
Every 60 Months		<b>Sodium</b> <b>Fluoride</b>	

### Notes:

Alkalinity and Field pH sampled twice per 12 month period with quarterly samples in February and August.

Lead sampled twice in every 36 month period.

**Bold** text items are Ontario Regulation 170/03 testing requirements.

Normal text items are recommended to monitor system performance.

Major Ions: Alkalinity (as CaCO<sub>3</sub>), Calcium Chloride, Conductivity, Fluoride, Hardness (as CaCO<sub>3</sub>), Iron, Magnesium, Manganese, pH, Potassium, Sodium, and Sulphate

APPENDIX B:  
Raw water quality summary

Bayshore Drive Wells 3,4,5  
Raw Water Quality - 2019  
Laboratory Results

Parameter	Treated Water		27-Feb-19			28-May-19			21-Aug-19			27-Nov-19		
	MAC	AO/OG	Well			Well			Well			Well		
			No. 3	No. 4	No. 5	No. 3	No. 4	No. 5	No. 3	No. 4	No. 5	No. 3	No. 4	No. 5
Alkalinity (as CaCO <sub>3</sub> ), mg/L		30 - 500	284	305	311	264	286	289	265	239	286	275	276	280
Calcium, mg/L			84.3	80.8	80.9	79.8	74.1	68.5	80.8	76.6	81.5	98.6	94.1	93.9
Chloride, mg/L		250	55	49	41	58	51	53	69	58	53	59	53	48
Colour, TCU		5	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Conductivity, uS/cm			696	670	659	708	709	689	723	665	687	723	666	649
Fluoride, mg/L	1.5		0.33	0.35	0.33	0.36	0.38	0.35	0.36	0.41	0.37	0.43	0.39	0.39
Hardness (as CaCO <sub>3</sub> ), mg/L		80 - 100	334	312	326	311	301	291	335	320	336	413	370	381
Iron, ug/L		300	227	161	468	237	196	352	98	176	387	273	222	424
Magnesium, mg/L			30	26.8	30.2	27.2	28.2	29.2	32.5	31.2	32.1	40.5	32.8	35.6
Manganese, ug/L		50	10.2	24	20.4	22.5	19.6	18.7	7.36	15.8	19	11.4	23	22.2
Nitrate, mg/L	10		<0.006	<0.006	<0.006	0.011	0.007	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Nitrite, mg/L	1.0		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Nitrate + Nitrite, mg/L			<0.006	<0.006	<0.006	0.011	0.007	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
pH		6.5 - 8.5	7.64	7.71	7.66	8.15	8.16	8.13	8.2	8.27	8.25	7.88	7.76	7.74
Potassium, mg/L			3.91	3.54	3.33	3.20	3.28	2.98	4.52	4.3	3.86	6.07	4.15	3.96
Sodium, mg/L	20	200	25.5	23.1	20.1	23.4	24	20.6	26.5	20.5	19.9	36.3	28.9	26
Sulphate, mg/L		500	31	16	12	21	24	25	31	20	14	34	21	14

MAC - Maximum Acceptable Concentration in Treated Water  
AO - Aesthetic Objective  
OG - Operational Guideline

APPENDIX C:  
Annual Report



Part III Form 2
Section 11. ANNUAL REPORT.

Table with 2 columns: Label (Drinking-Water System Number, Name, Owner, Category, Period) and Value (220012724, Bayshore Village Well Supply, The Corporation of the Township of Ramara, Large Municipal Residential, January 1, 2019 to December 31, 2019)

Form with two columns. Left column: 'Complete if your Category is Large Municipal Residential or Small Municipal Residential'. Right column: 'Complete for all other Categories.' Includes questions about serving more than 10,000 people, public availability of reports, and interested authorities.

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Table with 2 columns: Drinking Water System Name, Drinking Water System Number

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [ ] No [ ]
\*Not applicable



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web**
- Public access/notice via Government Office**
- Public access/notice via a newspaper**
- Public access/notice via Public Request**
- Public access/notice via a Public Library**
- Public access/notice via other method**

**Describe your Drinking-Water System**

The Bayshore Village Subdivision Drinking Water System consists of three groundwater wells, a disinfection system, one underground reservoir, one high lift pumping station and approximately 7,200 m of 150 mm diameter watermains.

Bayshore Village gets its water supply from three groundwater wells named as Wells No. 3, 4 and 5. Each raw water line is injected with sodium hypochlorite before entering the 112,000 L water reservoir located under the water works building. The treated water is pumped from the reservoir via three vertical turbine pumps to the distribution system.

Continuous water quality on-line analyzers monitor the free chlorine residual, pH and turbidity of the treated water before it enters the distribution system. The analyzers are logged continuously by the paperless chart recorder and have alarm set points to notify the operators of adverse water quality results.

The water works is equipped with an 80 kW diesel emergency generator. The generator has sufficient capacity to run the entire Water Works. The generator can operate for 24 hours at maximum capacity when its fuel tank is full.

**List all water treatment chemicals used over this reporting period**

Sodium Hypochlorite

**Were any significant expenses incurred to?**

- Install required equipment
- Repair required equipment
- Replace required equipment

**Please provide a brief description and a breakdown of monetary expenses incurred**

- Replace battery in UPS for SCADA computer (\$200)
- Install new magnetic flow meter and repair piping on well #3. (\$5000)
- New pressure transducer distribution pump #5 (\$600)
- Replace 2 Service lines under Bayshore Drive (\$6000)



**Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
2019/09/30	Total Coliforms	9	cfu/100mL	Resample and test	2019/10/02
2019/09/30	Total Coliforms	3	cfu/100mL	Resample and test	2019/10/02
2019/11/25	E.Coli	NDOGN		Resample and test, disinfection restored, mains/pipes flushed	2019/11/27 2019/11/28
2019/11/25	Total Coliforms	NDOGN		Resample and test, disinfection restored, mains/pipes flushed	2019/11/27 2019/11/28

**Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.**

	Number of Samples	Range of E. Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
<b>Raw</b>	147	0	0	0	
<b>Treated</b>	52	0	0	52	0 - 10
<b>Distribution</b>	112	0	0-9	104	0 - 2

**Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.**

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure	<i>NOTE: For continuous monitors use 8760 as the number of samples.</i>
<b>Turbidity</b>	8760	0 – 2.04	NTU	
<b>Chlorine</b>	8760	0 – 2.46	mg/L	
<b>Fluoride</b> (If the DWS provides fluoridation)		N/A		

**NOTE:**

*When free chlorine residual was measured to be outside of the operating range of **0.4 mg/L to 4.0 mg/L**, the results were confirmed by operators as non-reportable events by use of a hand held analyzer. All results obtained outside the operating range were attributed to testing of alarm set-points, short term power failure, regular maintenance or cleaning.*

*When a turbidity value was recorded to exceed the limit of **1.0 NTU**, the results were checked by operators by use of a hand held analyzer. All results obtained outside the objective range were attributed to testing of alarm set-points, short term power failure, regular maintenance or cleaning.*



**Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.**

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	21-Aug-19	<0.09	µg/L	
Arsenic	21-Aug-19	<0.02	µg/L	
Barium	21-Aug-19	237	µg/L	
Boron	21-Aug-19	233	µg/L	
Cadmium	21-Aug-19	<0.003	µg/L	
Chromium	21-Aug-19	0.12	µg/L	
Lead (Distribution)	21-Aug-19	0.13	µg/L	
Lead (Distribution)	21-Aug-19	0.03	µg/L	
Lead (Distribution)	21-Aug-19	0.52	µg/L	
Mercury	21-Aug-19	<0.01	µg/L	
Selenium	21-Aug-19	<0.04	µg/L	
Sodium	03-Sept-15	27.8	mg/L	
Uranium	21-Aug-19	0.099	µg/L	
Fluoride	15-Aug-17	0.34	mg/L	
Nitrite	27-Feb-19	<0.003	mg/L	
Nitrite	28-May-2019	<0.003	mg/L	
Nitrite	21-Aug-19	<0.003	mg/L	
Nitrite	27-Nov-19	<0.003	mg/L	
Nitrate	27-Feb-19	0.011	mg/L	
Nitrate	28-May-2019	0.010	mg/L	
Nitrate	21-Aug-19	0.012	mg/L	
Nitrate	27-Nov-19	0.010	mg/L	

**Summary of lead testing under Schedule 15.1 during this reporting period**

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Plumbing				
Distribution	5	0.01-0.52	ug/L	0



# Ontario Drinking-Water Systems Regulation O. Reg. 170/03

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	21-Aug-19	<0.02	µg/L	
Atrazine + N-dealkylated metabolites	21-Aug-19	<0.01	µg/L	
Azinphos-methyl	21-Aug-19	<0.05	µg/L	
Benzene	21-Aug-19	<0.32	µg/L	
Benzo(a)pyrene	21-Aug-19	<0.004	µg/L	
Bromoxynil	21-Aug-19	<0.33	µg/L	
Carbaryl	21-Aug-19	<0.05	µg/L	
Carbofuran	21-Aug-19	<0.01	µg/L	
Carbon Tetrachloride	21-Aug-19	<0.17	µg/L	
Chlorpyrifos	21-Aug-19	<0.02	µg/L	
Diazinon	21-Aug-19	<0.02	µg/L	
Dicamba	21-Aug-19	<0.02	µg/L	
1,2-Dichlorobenzene	21-Aug-19	<0.41	µg/L	
1,4-Dichlorobenzene	21-Aug-19	<0.36	µg/L	
1,2-Dichloroethane	21-Aug-19	<0.35	µg/L	
1,1-Dichloroethylene	21-Aug-19	<0.33	µg/L	
Dichloromethane	21-Aug-19	<0.35	µg/L	
2-4 Dichlorophenol	21-Aug-19	<0.15	µg/L	
2,4-Dichlorophenoxy acetic acid (2,4-D)	21-Aug-19	<0.19	µg/L	
Diclofop-methyl	21-Aug-19	<0.40	µg/L	
Dimethoate	21-Aug-19	<0.06	µg/L	
Diquat	21-Aug-19	<1	µg/L	
Diuron	21-Aug-19	<0.03	µg/L	
Glyphosate	21-Aug-19	<1	µg/L	
Malathion	21-Aug-19	<0.02	µg/L	
Metolachlor	21-Aug-19	<0.01	µg/L	
Metribuzin	21-Aug-19	<0.02	µg/L	
Monochlorobenzene	21-Aug-19	<0.3	µg/L	
Paraquat	21-Aug-19	<1	µg/L	
Pentachlorophenol	21-Aug-19	<0.15	µg/L	
Phorate	21-Aug-19	<0.01	µg/L	
Picloram	21-Aug-19	<1	µg/L	
Polychlorinated Biphenyls(PCB)	21-Aug-19	<0.04	µg/L	
Prometryne	21-Aug-19	<0.03	µg/L	
Simazine	21-Aug-19	<0.01	µg/L	
THM (NOTE: show latest annual average)	27-Feb-19- 27-Nov-19	44.5	µg/L	
Terbufos	21-Aug-19	<0.01	µg/L	
Tetrachloroethylene	21-Aug-19	<0.35	µg/L	
2,3,4,6-Tetrachlorophenol	21-Aug-19	<0.20	µg/L	
Triallate	21-Aug-19	<0.01	µg/L	
Trichloroethylene	21-Aug-19	<0.44	µg/L	
2,4,6-Trichlorophenol	21-Aug-19	<0.25	µg/L	
2-Chloro-2-methylphenoxy acetic acid	21-Aug-19	<0.00012	mg/L	
Trifluralin	21-Aug-19	<0.02	µg/L	
Vinyl Chloride	21-Aug-19	<0.17	µg/L	



**List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.**

<b>Parameter</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Date of Sample</b>