The 2017 Annual Drinking Water Quality Report:

Burlington, Burloak and Oakville Water Purification Plants and the South Halton Water Distribution System

February 2018

Introduction

Halton is committed to providing safe drinking water to all of our customers. As mandated by the *Safe Drinking Water Act, 2002*, this annual Water Quality Report includes:

- a description of the water treatment process and chemicals used;
- any major expenses to install, repair or upgrade equipment in the system; and,
- the results of our water tests and how they compare to provincial regulatory standards.

In the Burlington, Burloak and Oakville Water Purification Plants and in the South Halton Water Distribution System, all provincial regulatory monitoring requirements were met or surpassed in 2017.

Burlington Water Purification Plant

Drinking Water System Number: 220001664

The Burlington Water Purification Plant (WPP), located at 3249 Lakeshore Road, Burlington, was designed to produce about 263 ML/d (million litres per day) of treated drinking water. The raw water source is Lake Ontario.

The facility is a conventional filtration treatment plant with a process that consists of coagulation, flocculation and sedimentation using the Actiflo® process (microsand ballasted clarification), filtration, fluoridation, ozonation (disinfection and taste and odour control) and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in 2017 were:

- chlorine gas (disinfection and control of particle counts on filters and mussel formation at the intakes);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride with provision to switch to aluminum sulphate (coagulation);
- polymer (coagulation aid);
- waste polymer (waste treatment aid);
- sodium bisulphite or calcium thiosulphate (dechlorination and ozone quenching);
- sodium metabisulphite (waste dechlorination);
- liquid oxygen (ozone generation); and
- hydrogen peroxide (ozone quenching, taste and odour control).

The plant is controlled through a computerized Supervisory and Data Acquisition (SCADA) system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton distribution system which serves Burlington, Oakville and areas of Milton and Halton Hills.

Burloak Water Purification Plant

Drinking Water System Number: 260085436

The Burloak Water Purification Plant (WPP), located at 3380 Rebecca Street, Oakville, currently has a rated capacity to produce 55 ML/d (million litres per day) of treated drinking water. The raw water source is Lake Ontario.

The facility is a membrane filtration treatment plant with a process that consists of flocculation, ultra-filtration (via membranes), ultra-violet irradiation, ozonation (disinfection and taste and odour control), fluoridation and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in 2017 were:

- chlorine gas (disinfection and mussel control);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride (as necessary - coagulant);
- citric acid (clean membranes);
- sodium bisulphite (dechlorination and ozone quenching);

- liquid oxygen (ozone generation); and
- potassium hydroxide (pH adjustment on waste system).

The plant is controlled through a computerized Supervisory and Data Acquisition (SCADA) system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton distribution system which serves Burlington, Oakville and areas of Milton and Halton Hills.

Oakville Water Purification Plant

Drinking Water System Number: 220001637

The Oakville Water Purification Plant (WPP), located at 21 Kerr Street, Oakville, was designed to produce about 109 ML/d (million litres per day) of treated drinking water. The raw water source is Lake Ontario.

The facility is a conventional filtration treatment plant with a process that consists of coagulation, flocculation and sedimentation using the Actiflo® process (microsand ballasted clarification), filtration, fluoridation, ozonation (disinfection and taste and odour control) and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in 2017 were:

- chlorine gas (disinfection and mussel control);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride with provision to switch to aluminum sulphate (coagulation);
- polymer - solid (coagulation aid);
- polymer - liquid (filtration and residue management aid);
- liquid oxygen (ozone generation);
- provision for hydrogen peroxide addition (taste and odour control); and
- calcium thiosulphate (dechlorination and ozone quenching).

The plant is controlled through a computerized Supervisory and Data Acquisition (SCADA) system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton Distribution System which serves Burlington, Oakville and areas of Milton and Halton Hills.

South Halton Water Distribution System

Drinking Water System Number: 260085462

The South Halton Distribution System was registered as a separate system in 2007. Prior to this change, the Burlington and Oakville water distribution systems were associated with the respective purification plant. Currently, the treated water is supplied by the Burlington, Burloak and Oakville WPPs. The South Halton Distribution System serves Burlington, Oakville and areas of Milton and Halton Hills.

What Improvements Are We Making?

In 2017, over $28,479,000 was spent on capital upgrades to the Burlington, Burloak and Oakville treatment facilities and South Halton outlying stations. Projects included:

- upgrades at Oakville WPP – Design and study for future expansion;
- upgrades at Burlington WPP - Replacement of high lift and low lift pumps and installation of VFDs;
- reservoir and pumping station infrastructure repairs, upgrades and expansion at Davis Road PS, Appleby Line PS, Bailie Booster PS, Burloak PS (Zone 2), Beaufort Reservoir and Washburn PS and Reservoir; and
- new 30ML reservoir located at Trafalgar Road and No. 5 Side Road.

Approximately $82,863,000 was spent on water main projects in Oakville, Burlington and Milton (lake based) which are all connected to the South Halton distribution system. In addition to capital upgrades, Halton continued to support the

production and delivery of high quality, safe drinking water through water sampling and monitoring above the provincial requirements, upgrades to the SCADA monitoring and infrastructure management systems, cross-connection control, an update of the Water Master Plan, water efficiency programs and optimization of water treatment processes. Work also continued on the Drinking Water Quality Management System, a provincial requirement to support the licensing of municipal drinking water systems which came into effect for Halton in January 2009.

Water Quality Testing

A large number of water quality tests are performed each and every day, in accordance with the *Safe Drinking Water Act, 2002* and regulations. The following sections provide a summary of the test results.

Terms

CFU/100 mL	Colony-forming units per 100 millilitres of water
µg/L	micrograms per litre
mg/L	milligrams per litre
Standard	Ontario Drinking Water Quality Standard, O.Reg. 169/03

Microbiological Testing

	Number of Samples	*E. coli* Results (min - max)	Total Coliform Results (min - max)	Number of Heterotrophic Plate Count* Samples	Heterotrophic Plate Count Results (min – max)
Raw Water Burlington	52	0 - 80	1 - 930	N/A	N/A
Treated Water Burlington	52	0 - Absent	0 - Absent	52	0 - 2
Raw Water Oakville	52	0 – 40	0 – 2250	N/A	N/A
Treated Water Oakville	52	0 – Absent	0 – Absent	52	0 - 32
Raw Water Burloak	52	0 - 20	0 - 1200	N/A	N/A
Treated Water Burloak	52	0 - Absent	0 - Absent	52	0 - 8
Distribution	3037	0 - 1	0 - 1	2356	0 - 344

Microbiological standards for treated and distributed water:

E.coli	not detected
Total Coliforms	not detected
HPC	Heterotrophic Plate Counts are conducted on some treated and distribution system samples. The HPC test is used as a tool to monitor overall quality, but the results are not indicators of water safety. There is not a Drinking Water Quality Standard for HPC.

Operational Testing

At the Burlington and Oakville WPPs, continuous analyzers measure and record the results of chlorine residual, turbidity and fluoride residual throughout the treatment process and in the treated water several times per minute, twenty-four hours per day, seven days per week. All of the readings are validated by an operator and are also reviewed by the Ministry of Environment and Climate Change (MOECC) Inspector. As well, Halton operators measure the chlorine in the distributed water. 'Adverse' test results must be reported if there is an indication that primary inactivation (disinfection) may not have been achieved, if the turbidity of filtered water is >1.0 NTU, if the fluoride residual is >1.5 mg/L or if a free chlorine residual in the distribution system is <0.05 mg/L. In 2017, all validated readings and test results for these parameters were within the ranges required by regulation.

Chemical Testing

Inorganic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
Antimony	04/24/17	mg/L	<0.001	<0.001	<0.001	0.006	No
Arsenic	04/24/17	mg/L	0.001	0.001	0.001	0.01	No
Barium	04/24/17	mg/L	0.024	0.023	0.023	1.0	No
Boron	04/24/17	mg/L	0.026	0.023	0.024	5.0	No
Bromate (latest running annual average)	12/11/17	mg/L	0.003	0.004	0.004	0.01 (running annual average)	No
Cadmium	04/24/17	mg/L	<0.0005	<0.0005	<0.0005	0.005	No
Chromium	04/24/17	mg/L	<0.001	<0.001	<0.001	0.05	No
Mercury	04/24/17	mg/L	<0.00005	<0.00005	<0.00005	0.001	No
Selenium	04/24/17	mg/L	<0.001	<0.001	<0.001	0.05	No
Sodium	12/18/17	mg/L	13.8	14.1	14.5	20	No
Uranium	04/24/17	mg/L	<0.001	<0.001	<0.001	0.02	No
Fluoride	12/18/17	mg/L	0.73	0.56	0.62	1.5	No
Nitrite	11/27/17	mg/L	<0.02	<0.02	<0.02	1.0	No
Nitrate	11/27/17	mg/L	0.39	0.40	0.39	10.0	No

Organic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
Alachlor	04/24/17	µg/L	<0.5	<0.5	<0.5	5	No
Atrazine + N-dealkylated metobolites	04/24/17	µg/L	<1	<1	<1	5	No
Azinphos-methyl	04/24/17	µg/L	<2	<2	<2	20	No
Benzene	04/24/17	µg/L	<0.1	<0.1	<0.1	1	No
Benzo(a)pyrene	04/24/17	µg/L	<0.009	<0.009	<0.009	0.01	No
Bromoxynil	04/24/17	µg/L	<0.5	<0.5	<0.5	5	No
Carbaryl	04/24/17	µg/L	<5	<5	<5	90	No
Carbofuran	04/24/17	µg/L	<5	<5	<5	90	No
Carbon Tetrachloride	04/24/17	µg/L	<0.1	<0.1	<0.1	2	No
Chlorpyrifos	04/24/17	µg/L	<1	<1	<1	90	No
Diazinon	04/24/17	µg/L	<1	<1	<1	20	No
Dicamba	04/24/17	µg/L	<1	<1	<1	120	No
1,2-Dichlorobenzene	04/24/17	µg/L	<0.2	<0.2	<0.2	200	No
1,4-Dichlorobenzene	04/24/17	µg/L	<0.2	<0.2	<0.2	5	No
1,2-Dichloroethane	04/24/17	µg/L	<0.2	<0.2	<0.2	5	No
1,1-Dichloroethylene (vinylidene chloride)	04/24/17	µg/L	<0.1	<0.1	<0.1	14	No
Dichloromethane	04/24/17	µg/L	<0.5	<0.5	<0.5	50	No
2-4 Dichlorophenol	04/24/17	µg/L	<0.25	<0.25	<0.25	900	No

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
2,4-Dichlorophenoxy acetic acid (2,4-D)	04/24/17	µg/L	<1	<1	<1	100	No
Diclofop-methyl	04/24/17	µg/L	<0.9	<0.9	<0.9	9	No
Dimethoate	04/24/17	µg/L	<2.5	<2.5	<2.5	20	No
Diquat	04/24/17	µg/L	<7	<7	<7	70	No
Diuron	04/24/17	µg/L	<10	<10	<10	150	No
Glyphosate	04/24/17	µg/L	<10	<10	<10	280	No
HAA (latest running annual average)	11/27/17	µg/L	<5	<5	5.2	N/A	N/A
2-Methyl-4-chlorophenoxyacetic acid	04/24/17	µg/L	<10	<10	<10	100	No
Malathion	04/24/17	µg/L	<5	<5	<5	190	No
Metolachlor	04/24/17	µg/L	<0.5	<0.5	<0.5	50	No
Metribuzin	04/24/17	µg/L	<5	<5	<5	80	No
Monochlorobenzene	04/24/17	µg/L	<0.1	<0.1	<0.1	80	No
Paraquat	04/24/17	µg/L	<1	<1	<1	10	No
Pentachlorophenol	04/24/17	µg/L	<0.5	<0.5	<0.5	60	No
Phorate	04/24/17	µg/L	<0.5	<0.5	<0.5	2	No
Picloram	04/24/17	µg/L	<5	<5	<5	190	No
Polychlorinated Biphenyls(PCB)	04/24/17	µg/L	<0.05	<0.05	<0.05	3	No
Prometryne	04/24/17	µg/L	<0.25	<0.25	<0.25	1	No
Simazine	04/24/17	µg/L	<1	<1	<1	10	No
THM - Distribution (latest running annual average)	11/27/17	µg/L	27.4	27.4	27.4	100 (running annual average)	No
Terbufos	04/24/17	µg/L	<0.5	<0.5	<0.5	1	No
Tetrachloroethylene	04/24/17	µg/L	<0.1	<0.1	<0.1	30	No
2,3,4,6-Tetrachlorophenol	04/24/17	µg/L	<0.5	<0.5	<0.5	100	No
Triallate	04/24/17	µg/L	<1	<1	<1	230	No
Trichloroethylene	04/24/17	µg/L	<0.1	<0.1	<0.1	5	No
2,4,6-Trichlorophenol	04/24/17	µg/L	<0.5	<0.5	<0.5	5	No
Trifluralin	04/24/17	µg/L	<1	<1	<1	45	No
Vinyl Chloride	04/24/17	µg/L	<0.2	<0.2	<0.2	1	No

Additional Testing Required by the Municipal Drinking Water Licence

Parameter	Date Sampled	Burlington Result	Oakville Result	Burloak Result	Exceedance of Specified Concentration
Suspended solids in the treated wastewater at point of discharge (composite or automatic sampler)	Monthly (January to December)	4.4 mg/L (average) Max. per MDWL = 15 mg/L	12.0 mg/L (average) Max. per MDWL = 25 mg/L	17.0 mg/L[1] (average) Max. per MDWL = 15 mg/L	Yes[1]

'Adverse' Results Notifications

The following tables show the notices of 'adverse' water quality results submitted in accordance with the *Safe Drinking Water Act, 2002* to the MOECC and the Medical Officer of Health.

South Halton Distribution System

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
May 1, 2017	Distribution	Other Observation – Surface water entered reservoir cell due to a leak in the structure.	Isolated, by-passed and repaired affected cell. Drained, cleaned, disinfected and sampled prior to return to service. All results within acceptable limits.	July 19, 2017
June 22, 2017	Treatment	Analog card failed in the PLC and the fluoride pump continued operating while the plant shut down resulting in a brief spike in the fluoride residual above 1.5 mg/L.	High lift discharge piping was flushed back to the clearwell and the water was directed to waste.	June 23, 2017
July 11/17	Distribution	*E. coli* = 1 CFU/100mL	System flushed, resampled and results within acceptable limits	July 15, 2017
July 18, 2017	Distribution	Free chlorine = 0.03 mg/L and 0.02 mg/L (pre-flushing). Observed during dead-end optimization initiative.	Flushed system until secondary chlorine residual restored. Resampled for chlorine residual and results within acceptable limits.	July 25, 2017
July 20, 2017	Distribution	Free chlorine = 0.02 mg/L (pre-flushing). Observed during dead-end optimization initiative.	Flushed system until secondary chlorine residual restored. Resampled for chlorine residual and results within acceptable limits.	July 21, 2017
August 10, 2017	Distribution	Free chlorine = 0.04 mg/L and 0.04 mg/L (pre-flushing). Observed during dead-end optimization initiative.	Flushed system until secondary chlorine residual restored. Resampled for chlorine residual and results within acceptable limits.	August 10, 2017
September 19, 2017	Plumbing	Lead (Pb) = 0.0244 mg/L and 0.0238 mg/L (Duplicate)	No action required. Notified resident/owner.	N/A
October 5, 2017	Plumbing	Lead (Pb) = 0.374 mg/L and 0.413 mg/L (Duplicate)	No action required. Notified resident/owner.	N/A
November 13, 2017	Distribution	Total Coliform = 1 CFU/100mL	System flushed, resampled and results within acceptable limits	November 16, 2017

[1] The suspended solids limits for the water treatment plants are only applicable when the plants are discharging waste to the natural environment (i.e. storm sewer system). At the Burloak Water Plant, the waste discharges to the sanitary sewer system and the discharge to storm valve is normally closed meaning that the limit of 15 mg/L is not applicable unless this operational practice changes.

Community-Wide Lead Sampling Program Results

Under the Community-Wide Lead Sampling Program, seventy two sets of samples were collected from locations throughout the South Halton Distribution System in 2017. Two of the samples contained lead concentrations above the standard of 10 µg/L.

Microcystin Sampling Results

Under the direction of the MOECC, Microcystin samples were collected on a weekly basis from June to October 2017, from Oakville WPP, Burlington WPP and Burloak WPP. None of the samples contained Microcystin concentrations at or above the standard of 1.5 µg/L. The results for all raw and treated samples were <0.1 µg/L for Total Microcystin.

More Water Information

More information is available on our website: www.halton.ca/water. The annual Flow Summary Report 2017 will be available for inspection after March 31, 2018 at:

Halton Region Citizens' Reference Library
1151 Bronte Road
Oakville, ON L6M 3L1

Questions or Comments Welcome

We welcome your comments or questions. Please call us at the telephone numbers below.

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